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CANADIAN FUNDAMENTALS OF NURSING

Fifth Edition

Canadian Editors

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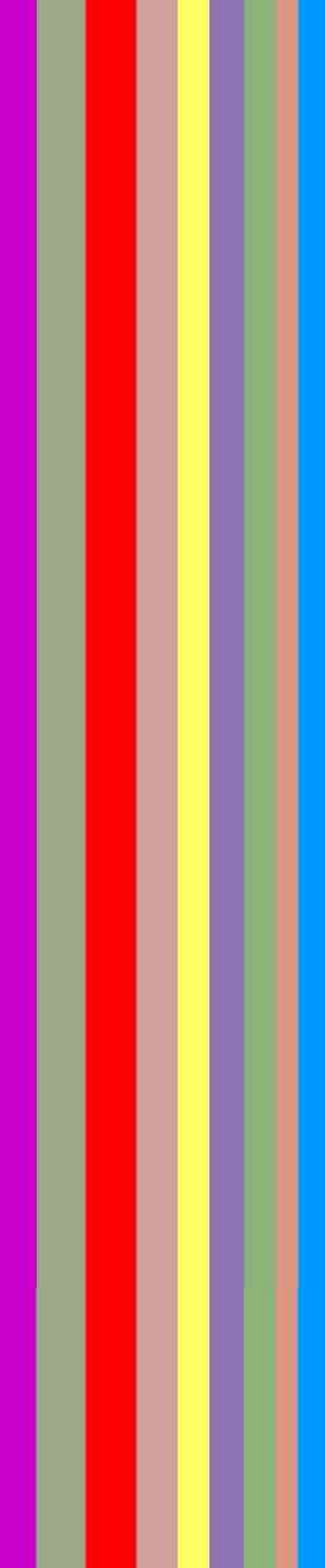
CANADIAN FUNDAMENTALS OF NURSING



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Contents

UNIT I

Health and Health Care in Canada

- 1 Health and Wellness, p. 1
- 2 The Canadian Health Care Delivery System, p. 15
- 3 The Development of Nursing in Canada, p. 29
- 4 Community Health Nursing Practice, p. 42

UNIT II

Foundations of Nursing Practice

- 5 Theoretical Foundations of Nursing Practice, p. 54
- 6 Research as a Basis for Practice, p. 65
- 7 Nursing Values and Ethics, p. 80
- 8 Legal Implications in Nursing Practice, p. 94
- 9 Global Health, Culture, and Diversity, p. 107
- 10 Nursing Leadership, Management, and Collaborative Practice, p. 125

UNIT III

Approaches to Nursing Care

- 11 Critical Thinking in Nursing Practice, p. 140
- 12 Nursing Assessment and Diagnosis, p. 153

ing and Implementing Nursing Care,

tion of Nursing Care, p. 193

15 Documenting and Reporting, p. 202

16 Nursing Informatics and Canadian Nursing Practice, p. 228

UNIT IV

Working With Patients and Families

- 17 Communication, p. 242
- 18 Caring in Nursing Practice, p. 262
- 19 Family Nursing, p. 273
- 20 Patient Education, p. 290

UNIT V

Caring Throughout the Lifespan

- 21 Developmental Theories, p. 309
- 22 Conception Through Adolescence, p. 326
- 23 Young to Middle Adulthood, p. 361
- 24 Older Adulthood, p. 374

UNIT VI

Psychosocial Considerations

- 25 Self-Concept, p. 396
- 26 Sexuality, p. 415
- 27 Spiritual Health, p. 433
- 28 The Experience of Loss, Death, and Grief, p. 447
- 29 Stress and Adaptation, p. 472

UNIT VII**Scientific Basis for Nursing Practice**

- 30 Vital Signs, p. 489
- 31 Health Assessment and Physical Examination, p. 537
- 32 Infection Control, p. 618
- 33 Medication Administration, p. 662
- 34 Complementary and Alternative Therapies, p. 751

UNIT VIII**Basic Physiological Needs**

- 35 Activity and Exercise, p. 769
- 36 Safety, p. 790
- 37 Hygiene, p. 825
- 38 Cardiopulmonary Functioning and Oxygenation, p. 877
- 39 Fluid, Electrolyte, and Acid-Base Balances, p. 936
- 40 Sleep, p. 992
- 41 Pain Assessment and Management, p. 1017
- 42 Nutrition, p. 1050
- 43 Urinary Elimination, p. 1112
- 44 Bowel Elimination, p. 1159

UNIT IX**Patients With Special Needs**

- 45 Mobility and Immobility, p. 1195
- 46 Skin Integrity and Wound Care, p. 1250
- 47 Sensory Alterations, p. 1301
- 48 Care of Surgical Patients, p. 1325

Appendix A: Practical Nursing in Canada,
p. 1371

Appendix B: Laboratory Values, p. 1388

References, p. 1400

Review Question Rationales, p. 1455

Index, p. 1475

Special Features

PATIENT (CLIENT) TEACHING

- Box 20-9 Teaching Strategies, p. 301
- Box 23-5 Encouraging Positive Health Habits, p. 371
- Box 25-11 Alterations in Self-Concept, p. 412
- Box 28-9 Preparing the Dying Patient's Family, p. 466
- Box 29-9 Stress Management Strategies, p. 484
- Box 31-6 Skin Assessment, p. 550
- Box 31-10 Hair and Scalp Assessment, p. 557
- Box 31-12 Nail Assessment, p. 559
- Box 31-14 Eye Assessment, p. 563
- Box 31-15 Ear Assessment, p. 564
- Box 31-16 Nose and Sinus Assessment, p. 568
- Box 31-17 Mouth and Pharyngeal Assessment, p. 569
- Box 31-18 Neck Assessment, p. 572
- Box 31-19 Lung Assessment, p. 579
- Box 31-20 Heart Assessment, p. 582
- Box 31-21 Vascular Assessment, p. 586
- Box 31-24 Female Breast Assessment, p. 593
- Box 31-25 Abdominal Assessment, p. 596
- Box 31-26 Female Genitalia and Reproductive Tract Assessment, p. 600
- Box 31-27 Male Genitalia Assessment, p. 600
- Box 31-29 Rectal and Anal Assessment, p. 604
- Box 31-30 Musculoskeletal Assessment, p. 606
- Box 31-33 Neurological Assessment, p. 614
- Box 32-17 Infection Control, p. 647
- Box 33-11 Safe Insulin Administration, p. 687
- Box 34-5 Relaxation, p. 758
- Box 34-7 Creative Visualization, p. 760
- Box 36-10 Correct Use of a Fire Extinguisher in the Home, p. 808
- Box 36-14 Prevention of Electrical Hazards in the Home, p. 820
- Box 37-14 Contact Lens Care, p. 864
- Box 38-12 Cardiovascular Disease, p. 900
- Box 39-9 Primary Health Care and Patient Teaching: Preventing and Managing Chronic Kidney Disease, p. 958
- Box 39-13 Home Intravenous Therapy, p. 989
- Box 42-9 Food Safety, p. 1079
- Box 43-13 Pelvic Floor Muscle Exercises (Kegels), p. 1155
- Box 45-2 Patients With Osteoporosis, p. 1200
- Box 45-11 Crutch Safety, p. 1244
- Box 46-11 Pressure-Redistribution Surfaces, p. 1276
- Box 48-6 Postoperative Instructions for Ambulatory Surgical Patients, p. 1360

CONCEPT MAPS

- Figure 12-4 Ms. Devine's Nursing Assessment Findings, 162
- Figure 12-9 Ms. Devine's Nursing Diagnoses, p. 169
- Figure 13-4 Planning Ms. Devine's Nursing Care, p. 184
- Figure 13-6 Planning Ms. Devine's Postoperative Nursing Care, p. 188
- Figure 25-7 Client After Surgical Reconstruction of Severe Facial Scars, p. 410
- Figure 26-5 Patient With Decreased Libido and Depression, p. 429
- Figure 28-4 Patient With Depression After the Death of his Wife, p. 461
- Figure 29-6 Patient With PTSD After Experiencing a Severe Physical Assault Four Months Ago, p. 483
- Figure 35-7 Patient With Heart Failure and Decreased Activity, p. 781
- Figure 36-5 Patient With a Cerebrovascular Accident Three Months Previously With Left-Sided Paralysis, Two Days After Right Femoral-Popliteal Bypass, p. 802
- Figure 37-7 Patient With Alzheimer's Disease and Hygiene Needs, p. 839
- Figure 38-8 Patient With Chronic Obstructive Pulmonary Disease and Pneumonia, p. 899
- Figure 39-10 Patient With Gastroenteritis and Dehydration, p. 957
- Figure 40-5 Patient Who Has Depression Following the News of her Mother's Recent Cancer Diagnosis, p. 1009
- Figure 41-9 Patient With Pain Related to Rheumatoid Arthritis, p. 1035

RESEARCH HIGHLIGHTS

- Figure 42-7 Patient With Myasthenia Gravis, p. 1077
- Figure 43-13 Patient With Urinary Tract Infection (UTI) and Dementia, p. 1133
- Figure 44-10 Patient Who Has Ovarian Cancer With Bone Metastases and Constipation, p. 1173
- Figure 45-11 Patient With Quadriplegia Related to an Acute Spinal Cord Injury at C7, p. 1216
- Figure 46-22 Patient With a Chronic Wound, p. 1273
- Figure 47-3 Patient With Retinal Detachment of Right Eye After Blunt Injury to Forehead, p. 1312
- Box 4-5 AIDS Prevention Street Nurse Program, p. 49
- Box 6-5 Renewing Everyday Hope: The Hope Experience of Family Caregivers of Persons With Dementia, p. 76
- Box 7-6 Ethics in Nursing Practice, p. 91
- Box 9-3 Globalization and the Cultural Safety of an Immigrant Muslim Community, p. 113
- Box 9-7 Intergenerational Trauma: Convergence of Multiple Processes Among First Nations Peoples in Canada, p. 121
- Box 9-8 Contemporary Perceptions of Health From an Indigenous (Plains Cree) Perspective, p. 122
- Box 11-2 Working Relationships of Public Health Nurses and High-Priority Families, p. 146
- Box 11-4 Decision Making by Baccalaureate Nursing Students, p. 149
- Box 14-1 Nursing-Sensitive Outcomes, p. 196
- Box 16-2 Evaluating Standardized Nursing Terminology, p. 236
- Box 19-7 Research Focus: Therapeutic Conversations With Family Members Experiencing Childhood Cancer, p. 283
- Box 20-3 The Effectiveness of Nurse-Directed Patient Education, p. 292
- Box 21-3 Toxic Stress and Development, p. 320
- Box 21-5 Supporting Parents: Can Intervention Improve Parent-Child Relationships?, p. 324
- Box 22-5 Breastfeeding, p. 337
- Box 23-3 Peer Navigators: Social Support During Health Challenges, p. 364
- Box 24-9 Designing a Fall-Prevention Strategy That Works, p. 393
- Box 25-3 Adolescent Self-Concept and Health, p. 402
- Box 25-4 Bullying and Self-Concept, p. 404
- Box 25-6 Promoting a Healthy Body Image, p. 405
- Box 26-1 Gender Issues and Sexual Desire: The Role of Emotional and Relationship Issues, p. 418
- Box 27-4 Mapping the Process and Qualities of Spiritual Nursing Care, p. 437
- Box 28-5 Family Perception of End-of-Life Care, p. 457
- Box 29-2 Understanding Risks for Developing Psychological Distress, p. 476
- Box 29-3 Spousal Support for Psychological Distress, p. 478
- Box 32-11 Reducing Surgical Site Infections, p. 639
- Box 32-14 Adverse Effects of Isolation, p. 643
- Box 34-3 Tai Chi as an Intervention to Improve Balance and Reduce Falls in Older Adults, p. 756
- Box 35-17 Energy Requirements of Tai Chi, p. 787
- Box 36-11 Effects of Nursing Rounds, p. 810
- Box 38-13 Ethnic and Gender Differences in Patient Education About Heart Disease Risk and Prevention, p. 900
- Box 39-10 Using Phlebitis and Infiltration Scales for Assessing PVAD, p. 970
- Box 39-14 Managing Chronic Kidney Disease, p. 989
- Box 40-3 Sleep Duration and Obesity, p. 996
- Box 41-7 Sucrose for Reducing Pain in Infants, p. 1028
- Box 42-14 Accuracy in Determining Placement of Feeding Tubes, p. 1101
- Box 43-12 Promoting Conservative Therapies for Older Adults, p. 1154
- Box 44-6 Constipation in Older Adults During an Acute Hospital Stay, p. 1174
- Box 45-4 The Meaning of Mobility, p. 1212
- Box 47-5 An Assistive Device May Be Viewed as a Stigma of Dependency, p. 1310

- Box 47-10 Self-Reported Sensory Impairment and Life Satisfaction in Older French-Speaking Adults, p. 1316
- Box 48-1 Pain Management Following Discharge After Ambulatory Same-Day Surgery, p. 1335

- Box 13-4 Acute Pain, p. 183
- Box 20-8 Learning Needs, p. 300
- Box 25-9 Disturbed Body Image, p. 408
- Box 26-4 Sexual Dysfunction, p. 428
- Box 28-8 Ineffective Coping, p. 459
- Box 29-7 Caregiver Role Strain, p. 482
- Box 30-9 Hyperthermia, p. 504
- Box 32-2 Perils of Central Venous Catheters, p. 625
- Box 32-7 Risk for Infection, p. 630
- Box 35-10 Activity Intolerance, p. 782
- Box 36-5 Risk for Injury, p. 800
- Box 37-6 Self-Care Deficit: Hygiene (Foot Care) Related to Visual Impairment and Knowledge Deficit, p. 839
- Box 38-11 Ineffective Airway Clearance/Retained Secretions, p. 898
- Box 39-8 Fluid Volume Deficit, p. 956
- Box 40-12 Disturbed Sleep Pattern, p. 1007
- Box 41-11 Acute Pain, p. 1034
- Box 42-6 Imbalanced Nutrition: Less Than Body Requirements, p. 1075
- Box 43-4 Mixed Urinary Incontinence, p. 1131
- Box 44-8 Constipation, p. 1177
- Box 45-6 Impaired Physical Mobility, p. 1214
- Box 47-7 Disturbed Sensory Perception, p. 1313
- Box 48-4 Deficient Knowledge Regarding Preoperative and Postoperative Care Requirements, p. 1339

- Box 27-5 Understanding a Patient's Spirituality, p. 439
- Box 28-10 Care of the Body After Death, p. 468
- Box 30-5 Measurement of Temporal Artery Temperature, p. 501
- Box 30-6 Use of a Glass Thermometer, p. 502
- Box 30-15 Palpating the Systolic Blood Pressure, p. 530
- Box 30-16 Electronic Blood Pressure Measurement, p. 532
- Box 32-13 Caring for a Patient on Isolation Precautions, p. 641
- Box 32-15 Donning a Surgical-Type Mask, p. 645
- Box 33-16 Giving Medications Through a Nasogastric Tube, Intestinal Tube, Gastrostomy Tube, or Small-Bore Feeding Tube, p. 698
- Box 33-17 Administering Nasal Instillations, p. 699
- Box 33-18 Administering Ear Medications, p. 704
- Box 33-19 Administering Vaginal Medications, p. 705
- Box 33-20 Administering Rectal Suppositories, p. 707
- Box 33-23 Mixing Two Kinds of Insulin in One Syringe, p. 721
- Box 33-26 Subcutaneous Butterfly Catheters and Hypodermoclysis, p. 748
- Box 36-7 Interventions for Accidental Poisoning, p. 805
- Box 37-12 Care of Dentures, p. 860
- Box 37-13 Shampooing the Hair of a Bed-Bound Patient, p. 862
- Box 37-16 Making an Unoccupied Bed, p. 874
- Box 41-13 Massage, p. 1038
- Box 42-13 Discontinuing Enteral Feedings via Nasogastric Tube, p. 1100
- Box 42-15 Obtaining Gastrointestinal Aspirate for pH Measurement, Large- and Small-Bore Feeding Tubes: Intermittent and Continuous Feeding, p. 1101
- Box 42-17 Providing Suction, p. 1104
- Box 43-11 Condom Catheter, p. 1153
- Box 44-1 Measuring Fecal Occult Blood, p. 1170
- Box 44-10 Digital Removal of Stool, p. 1185
- Box 45-7 Application of Sequential Compression Stockings, p. 1218
- Box 45-8 Application of Elastic Stockings, p. 1219

SKILLS

- Skill 30-1 Measuring Body Temperature, p. 495
- Skill 30-2 Assessing the Radial and Apical Pulses, p. 507
- Skill 30-3 Assessing Respirations, p. 515
- Skill 30-4 Measuring Oxygen Saturation (Pulse Oximetry), p. 518
- Skill 30-5 Measuring Blood Pressure, p. 524
- Skill 32-1 Handwashing/Hand Hygiene, p. 636
- Skill 32-2 Preparation of a Sterile Field, p. 650
- Skill 32-3 Surgical Handwashing/Hand Hygiene: Preparing for Gowning, p. 652
- Skill 32-4 Applying a Sterile Gown and Performing Closed Gloving, p. 655
- Skill 32-5 Open Gloving, p. 657
- Skill 33-1 Administering Oral Medications, p. 693
- Skill 33-2 Administering Ophthalmic Medications, p. 700
- Skill 33-3 Using Metered-Dose or Dry Powder Inhalers, p. 708
- Skill 33-4 Preparing Injections, p. 714
- Skill 33-5 Administering Injections, p. 722
- Skill 33-6 Adding Medications to Intravenous Fluid Containers, p. 727
- Skill 33-7 Administering Medications by Intravenous Bolus, p. 737
- Skill 33-8 Administering Intravenous Medications by Piggyback, Intermittent Intravenous Infusion Sets, and Mini-Infusion Pumps, p. 742
- Skill 36-1 Applying Physical Restraints, p. 815
- Skill 36-2 Seizure Precautions, p. 821
- Skill 37-1 Bathing a Patient, p. 843
- Skill 37-2 Performing Nail and Foot Care, p. 852
- Skill 37-3 Providing Oral Hygiene, p. 856
- Skill 37-4 Performing Mouth Care for an Unconscious or Debilitated Patient, p. 858
- Skill 37-5 Making an Occupied Bed, p. 868
- Skill 38-1 Suctioning, p. 905
- Skill 38-2 Care of an Artificial Airway, p. 913
- Skill 38-3 Care of Patients With Chest Tubes, p. 921
- Skill 38-4 Applying a Nasal Cannula or Oxygen Mask, p. 925
- Skill 38-5 Using Home Oxygen Equipment, p. 929
- Skill 39-1 Initiating a Peripheral Intravenous Infusion, p. 959
- Skill 39-2 Regulating Intravenous Flow Rates, p. 974
- Skill 39-3 Maintenance of Intravenous System, p. 978
- Skill 39-4 Changing a Peripheral Intravenous Dressing, p. 983
- Skill 42-1 Aspiration Precautions, p. 1072
- Skill 42-2 Blood Glucose Monitoring, p. 1082
- Skill 42-3 Inserting a Small-Bore Nasoenteric or Oral Tube for Enteral Feeding, p. 1088
- Skill 42-4 Administering Enteral Feedings via Nasoenteric Tube, p. 1093
- Skill 42-5 Administering Enteral Feedings via Gastrostomy or Jejunostomy Tube, p. 1097
- Skill 42-6 Inserting a Large-Bore Nasoenteric or Orogastic Tube for Gastric Suctioning, p. 1104
- Skill 43-1 Collecting a Midstream (Clean-Voided) Urine Specimen, p. 1125
- Skill 43-2 Inserting a Straight or In-Dwelling Catheter, p. 1139
- Skill 43-3 In-Dwelling Catheter Care, p. 1147
- Skill 43-4 Closed and Open Catheter Irrigation, p. 1149
- Skill 44-1 Administering a Cleansing Enema, p. 1182
- Skill 44-2 Pouching an Ostomy, p. 1189
- Skill 45-1 Moving and Positioning Patients in Bed, p. 1223
- Skill 45-2 Using Safe and Effective Transfer Techniques, p. 1233
- Skill 46-1 Assessment for Risk of Pressure Ulcer Development, p. 1254
- Skill 46-2 Treating Pressure Ulcers, p. 1278
- Skill 46-3 Applying Dry and Moist Dressings, p. 1282
- Skill 46-4 Performing Wound Irrigation, p. 1291
- Skill 46-5 Applying an Abdominal or Breast Binder, p. 1295
- Skill 46-6 Applying an Elastic Bandage, p. 1296
- Skill 48-1 Demonstrating Postoperative Exercises, p. 1343

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Fifth Edition

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Unit I Health and Health Care in Canada

1 Health and Wellness, 1

Written by Linda Reutter, RN (Ret.), PhD, and
Kaysi Eastlick Kushner, RN, PhD

Conceptualizations of Health, 2

Classifications of Health Conceptualizations, 2

Historical Approaches to Health in Canada, 3

Medical Approach, 3

Behavioural Approach, 3

Socioenvironmental Approach, 4

Determinants of Health, 6

Income and Social Status (Income Distribution), 7

Social Support Networks, 7

Education and Literacy, 7

Employment and Working Conditions, 7

Physical Environments, 8

Biological and Genetic Endowment, 8

Individual Health Practices and Coping Skills, 8

Healthy Child Development, 9

Health Services, 9

Gender, 9

Culture, 10

Social Environments, 10

Strategies to Influence Health Determinants, 10

Health Promotion and Disease Prevention, 10

Health Promotion Strategies, 11

Population Health Promotion Model: Putting It All Together, 12

Summary, 13

2 The Canadian Health Care Delivery System, 15

Written by Pammla Lusenga Petrucka, RN, PhD

Evolution of the Canadian Health Care System, 16

Early Health Care in Canada, 16

Aboriginal Health Care, 18

Organization and Governance of Health Care, 19

Federal Jurisdiction, 19

Provincial and Territorial Jurisdiction, 19

Professional Jurisdiction, 19

Health Care Spending, 19

Trends and Reforms in Canada's Health Care System, 19

Role of Nurses in Health Care Policy, 20

Right to Health Care, 20

Rights Within the Health Care System, 20

Primary Health Care, 21

Barriers to Primary Health Care, 21

Future of Primary Health Care, 22

Settings for Health Care Delivery, 23

Institutional Sector, 23

Community Sector, 24

Levels of Care, 25

Level 1: Health Promotion, 25

Level 2: Disease and Injury Prevention, 25

Level 3: Diagnosis and Treatment, 25

Level 4: Rehabilitation, 25

Level 5: Supportive Care, 26

Challenges to the Health Care System, 26

Cost Accelerators, 26

Equality and Quality, 26

Nursing's Future in the Emerging Health Care System, 27

3 The Development of Nursing in Canada, 29

Written by Janet C. Ross-Kerr, RN, BScN, MS, PhD, and
Sonya Grypma, RN, PhD

Highlights of World Nursing History, 30

Early History of Nursing in Canada, 30

The First Nurses and Hospitals in New France, 30

The Birth of Home Visiting and the Grey Nuns, 31

Nursing During the British Regime, 31

Health Care in the West and the Grey Nuns, 31

The Nineteenth Century and Florence Nightingale, 32

Globalization and the Emergence of Modern Nursing, 33

Missionary Nursing, 33

Nursing in Remote Regions of Canada, 33

Gender and Diversity in Nursing, 34

Nursing Education in Canada, 34

The First Canadian Nursing Schools, 35

The Impact of Nursing Organizations on Nursing Education, 35

The Origins of the Canadian Nurses Association and Provincial Nursing Associations, 36

The First University Programs, 37

Health Care and Educational Reform, 37

The Weir Report, 37

The Royal Commission on Health Services of 1964, 37

Canadian Nurses Association Reports, 38

Baccalaureate Entry-to-Practice, 38

Influence of Periods of Social Upheaval on Nursing, 38

Public Health, Military Conflicts, and the Emergence of University Nursing Education, 38

From the Depression to the Post-World War II Years, 39

Emerging From Economic and Military Crises, 40

Nursing Education Today, 40

Conclusion, 40

4 Community Health Nursing Practice, 42

Written by Kaysi Eastlick Kushner, RN, PhD

Promoting the Health of Populations and Community Groups, 44

Community Health Nursing Practice, 44

Public Health Nursing, 45

Home Health Nursing, 45

The Changing Focus of Community Health Nursing Practice, 46

Vulnerable Populations, 47

Standards, Competencies, Roles, and Activities in Community Health Nursing, 50

Community Assessment, 51
Promoting Clients' Health, 52

Unit II Foundations of Nursing Practice

5 Theoretical Foundations of Nursing Practice, 54

Written by Sally Thorne, RN, PhD

Early Nursing Practice and the Emergence of Theory, 55

Nursing Process, 55

Conceptual Frameworks, 56

Metaparadigm Concepts, 56

Client and Person, 57

Environment, 57

Health, 57

Nursing, 58

Philosophy of Nursing Science, 58

Scientific Revolutions, 58

Complexity Science, 58

Ways of Knowing in Nursing Practice, 58

Paradigm Debates Within Nursing, 58

Nursing Diagnosis, 59

Reflections on Conceptualizing Nursing, 59

Major Theoretical Models, 59

Practice-Based Theories, 60

Needs Theories, 60

Interactionist Theories, 61

Systems Theories, 61

Simultaneity Theories, 62

Theorizing in the Future, 62

6 Research as a Basis for Practice, 65

Original chapter by Patricia A. Potter, RN, MSN, PhD, FAAN

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Why Evidence?, 66

Researching the Evidence, 66

Ask the Clinical Question, 66

Collect the Best Evidence, 67

Critique the Evidence, 68

Integrate the Evidence, 69

Evaluate the Practice Decision or Change, 70

Support for Evidence-Informed Practice, 70

Knowledge Development in Nursing, 70

Empirics: The Science of Nursing, 70

Esthetics: The Art of Nursing, 70

Personal Knowledge, 70

Ethics: The Moral Component, 71

Emancipatory Knowing: The Social, Economic, and Political Component, 71

The Development of Research in Nursing, 71

The History of Nursing Research in Canada, 71

Nursing Research, 73

The Scientific Paradigm, 73

The Qualitative (Interpretive) Paradigm, 74

Research Designs, 74

Quantitative Nursing Research, 74

Qualitative Nursing Research, 75

Conducting Nursing Research, 77

Ethical Issues in Research, 77

Rights of Other Research Participants, 77

Applying Research Findings to Nursing Practice, 78

7 Nursing Values and Ethics, 80

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Values, 81

Values Formation, 81

Values Clarification, 81

Ethics, 82

Nursing and Ethics, 82

Ethical Theory, 84

Ethical Analysis and Nursing, 86

Ethical Issues in Nursing Practice, 88

Patient Care Issues, 88

Issues of Safety in the Work Environment, 90

8 Legal Implications in Nursing Practice, 94

Written by Carla Shapiro, RN, MN

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Legal Limits of Nursing, 94

Sources of Law, 95

Professional Regulation, 95

Regulation of Nurse Practitioners, 95

Standards of Care, 95

Legal Liability Issues in Nursing Practice, 97

Torts, 97

Intentional Torts, 97

Unintentional Torts, 98

Criminal Liability, 99

Consent, 99

Nursing Students and Legal Liability, 100

Professional Liability Protection, 101

Abandonment, Assignment, and Contract Issues, 101

Legal Issues in Nursing Practice, 102

Abortion, 102

Drug Regulations and Nurses, 102

Communicable Diseases, 103

Death and Dying, 103

Advance Directives and Health Care Surrogates, 104

Organ Donation, 104

Mental Health Issues, 104

Public Health Issues, 104

Risk Management, 105

Professional Involvement, 105

9 Global Health, Culture, and Diversity, 107

Written by Barbara J. Astle, RN, PhD, Sylvia S. Barton, RN, PhD, Leanne Johnson, RN, MN, and Judy Mill, RN, PhD

Global Health, 107

Health Equity, 108

Global Citizenship, 108

Cultural Diversity, 109

Understanding Cultural Concepts, 110

Cultural Conflicts, 111

Historical Development of the Concept of Culture, 111

Cultural Assessment, 114**Selected Components of Cultural Assessment, 116**

- Ethnohistory, 116
- Social Organization, 116
- Socioeconomic Status, Biocultural Ecology, and Health Risks, 118
- Language and Communication, 118
- Religion and Spirituality, 118
- Caring Beliefs and Practices, 118
- Experience With Professional Health Care, 119

Application of Cultural Assessment Components to Aboriginal Peoples of Canada, 119

- Ethnohistory, 119
- Social Organization, 120
- Socioeconomic Status, 120
- Biocultural Ecology and Health Risks, 120
- Language and Communication, 121
- Religious and Spiritual Practices, 121
- Caring Beliefs and Practices, 122
- Experience With Professional Health Care, 122
- Implications for Nursing Practice, 122

10 Nursing Leadership, Management, and Collaborative Practice, 125

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Management and Leadership Roles for Nurses, 126

- Nursing Care Delivery Models, Collaborative Practice, and Nursing Teams, 126
- Decision Making, 130
- Clinical Care Coordination, 133

Quality Care and Patient Safety, 135

- Quality in Nursing Practice, 135
- Building a Culture of Safety, 135

Leadership Skills for Nursing Students, 136

- Career Development and Mentoring for Nursing Students, 136

Unit III Approaches to Nursing Care**11 Critical Thinking in Nursing Practice, 140**

Original chapter by Patricia A. Potter, RN, MSN, PhD, FAAN
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Critical Thinking Defined, 141**A Critical Thinking Model for Clinical Decision Making, 141****Levels of Critical Thinking in Nursing, 142**

- Basic Critical Thinking, 142
- Complex Critical Thinking, 142
- Commitment, 143

Components of Critical Thinking in Nursing, 143

- Specific Knowledge Base, 143
- Experience, 144

Critical Thinking Competencies, 144

- General Critical Thinking Competencies, 144
- Specific Critical Thinking Competencies in Clinical Situations, 145
- Nursing Process as a Critical Thinking Competency, 147
- Attitudes for Critical Thinking, 147
- Standards for Critical Thinking, 148

Developing Critical Thinking Skills, 148

- Reflective Journal Writing, 148
- Concept Mapping, 149

Critical Thinking Synthesis, 149**12 Nursing Assessment and Diagnosis, 153**

Original chapter by Patricia A. Potter, RN, MSN, PhD, FAAN
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Critical Thinking Approach to Assessment, 154**Data Collection, 155**

- Types of Data, 156
- Sources of Data, 156
- Methods of Data Collection, 158
- Cultural Considerations in Assessment, 160
- Nursing Health History, 160
- Family History, 160
- Documentation of History Findings, 160
- Physical Examination, 160
- Data Documentation, 162
- Concept Mapping, 162

Nursing Diagnosis, 162**Critical Thinking and the Nursing Diagnostic Process, 165**

- Formulation of the Nursing Diagnosis, 166
- Components of a Nursing Diagnosis, 166

Concept Mapping for Nursing Diagnoses, 168**Sources of Diagnostic Errors, 169**

- Errors in Data Collection, 170
- Errors in Interpretation and Analysis of Data, 170
- Errors in Data Clustering, 170
- Errors in the Diagnostic Statement, 170
- Documentation, 170

Nursing Diagnoses: Application to Care Planning, 170**13 Planning and Implementing Nursing Care, 173**

Original chapter by Patricia A. Potter, RN, MSN, PhD, FAAN
Canadian content written by Willena I. Nemeth, RN, MN,

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Planning Nursing Care, 173**Establishing Priorities, 174****Critical Thinking in Establishing Goals and Expected Outcomes, 175**

- Goals of Care, 176
- Expected Outcomes, 177
- Combining Goals and Outcome Statements, 177
- Guidelines for Writing Goals and Expected Outcomes, 177

Types of Interventions, 178**Selection of Interventions, 178**

- Nursing Interventions Classification, 179

Planning Nursing Care, 182

- Institutional Care Plans, 182
- Concept Maps, 182

Consulting Other Health Care Professionals, 184

- Implementing Nursing Care, 185

Critical Thinking in Implementation, 185**Standard Nursing Interventions, 185**

- Clinical Practice Guidelines and Protocols, 185
- Medical Directives or Standing Orders, 186
- Nursing Intervention Classifications System, 186

Implementation Process, 186

- Reassessing the Client, 187
- Reviewing and Revising the Existing Nursing Care Plan, 187
- Organizing Resources and Care Delivery, 187
- Anticipating and Preventing Complications, 187
- Implementation Skills, 188

Direct Care, 189

- Activities of Daily Living, 189
- Instrumental Activities of Daily Living, 189
- Physical Care Techniques, 189
- Life-Saving Measures, 189
- Counselling, 189
- Teaching, 189
- Controlling for Adverse Reactions, 190
- Preventive Measures, 190

Indirect Care, 190

- Communicating Nursing Interventions, 190
- Delegating, Supervising, and Evaluating the Work of Other Staff Members, 190

Achieving Client-Centred Goals, 190**14 Evaluation of Nursing Care, 193**

- Original chapter by Patricia A. Potter, RN, MSN, PhD, FAAN
- Canadian content written by Debbie A. Brennick, RN, MN, Willena I. Nemeth, RN, MN, and S. Helen Fraser, RN, MN

Critical Thinking and Evaluation, 194**The Evaluation Process, 195**

- Identifying Criteria and Standards, 195
- Collecting Evaluative Data, 196
- Interpreting and Summarizing Findings, 197
- Documenting Findings, 198
- Care Plan Revision, 198
- Discontinuing a Care Plan, 199
- Modifying a Care Plan, 199
- Goals and Expected Outcomes, 199
- Interventions, 199

15 Documenting and Reporting, 202

- Original chapter by Frank Lyerla, RN, PhD
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Confidentiality, 203

- Personal Information Protection and Electronic Documents Act, 203

Multidisciplinary Communication Within the Health Care Team, 203**Purposes of Records, 204**

- Communication and Care Planning, 204
- Legal Documentation, 204
- Education, 204
- Funding and Resource Management, 206

Research, 206

Auditing-Monitoring, 206

Guidelines for Quality Documentation and Reporting, 206

- Factual, 206
- Accurate, 206
- Complete, 207
- Current, 208
- Organized, 208
- Compliant With Standards, 208

Common Documentation Systems, 208

- Narrative Documentation, 208
- Problem-Oriented Medical Records or Health Care Records, 208
- Source Records, 209
- Charting by Exception, 210
- Case Management Plan and Critical Pathways or Care Maps, 210

Common Record-Keeping Forms, 213

- Admission Nursing History Forms, 213
- Flow Sheets and Graphic Records, 213
- Patient Care Summary or Kardex, 213
- Acuity Records or Workload Measurement Systems, 219
- Standardized Care Plans, 219
- Discharge Summary Forms, 219

Home Health Care Documentation, 220**Long-Term Health Care Documentation, 220****Computerized Documentation, 220**

- Nursing Information Systems, 222
- Clinical Information Systems, 223

The Electronic Health Record, 223**Reporting, 223**

- Change-of-Shift Reports, 223
- Telephone Reports, 225
- Telephone or Verbal Orders, 225
- Transfer Reports, 225
- Incident Reports, 225

16 Nursing Informatics and Canadian Nursing Practice, 228

- Written by Kathryn J. Hannah, RN, PhD, and Margaret Ann Kennedy, RN, PhD, CPHIMS-CA

Nursing Informatics and the Canadian Health Care System, 229

- Defining Nursing Informatics, 229
- Evolution of Informatics in the Canadian Health Care System, 229

Standards in Health Informatics, 231

- Standards Development in Canada, 233
- Standardizing Nursing Language, 233
- Health Information: Nursing Components, 233
- International Classification for Nursing Practice®, 233

Canadian Privacy Legislation, 235**National e-Nursing Strategy, 237****Clinician Engagement and Informatics Communities, 239**

Unit IV Working With Patients and Families

17 Communication, 242

Written by Sonya L. Jakubec, RN, MN, PhD(c), and
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Communication and Interpersonal Relationships, 243

Developing Communication Skills, 243

Levels of Communication, 244

- Intrapersonal Communication, 244
- Interpersonal Communication, 245
- Transpersonal Communication, 245
- Small-Group Communication, 245
- Public Communication, 245

Basic Elements of the Communication Process, 245

- Referent, 245
- Sender and Receiver, 245
- Messages, 245
- Channels, 246
- Feedback, 246
- Interpersonal Variables, 246
- Environment, 246

Forms of Communication, 246

- Verbal Communication, 246
- Nonverbal Communication, 247
- Symbolic Communication, 248
- Metacommunication, 248

Professional Nursing Relationships, 248

- Nurse–Patient Helping Relationships, 248
- Nurse–Family Relationships, 250
- Interprofessional Team Relationships, 250
- Nurse–Community Relationships, 250

Elements of Professional Communication, 250

- Courtesy, 250
- Use of Names, 250
- Trustworthiness, 250
- Autonomy and Responsibility, 251
- Assertiveness, 251

Communication Within the Nursing Process, 251

- Assessment, 251
- Nursing Diagnosis, 253
- Planning, 253
- Implementation, 253
- Evaluation, 258

18 Caring in Nursing Practice, 262

Original chapter by Anne Griffin Perry, RN, EdD, FAAN
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Theoretical Views on Caring, 263

- Caring Is Primary, 263
- The Essence of Nursing and Health, 264
- Transpersonal Caring, 264
- Swanson's Theory of Caring, 264
- The Human Act of Caring, 265
- The Moral and Ethical Bases of Responsive Nurse–
Patient Relationships, 266
- Summary of Theoretical Views, 266

Patients' Perceptions of Caring, 267

Ethic of Care, 267

Caring in Nursing Practice, 268

- Providing Presence, 268
- Touch, 268
- Listening, 269
- Knowing the Patient, 269
- Spiritual Caring, 270
- Family Care, 270

The Challenge of Caring, 270

19 Family Nursing, 273

Written by Christina West, RN, PhD, and Sonya L. Jakubec,
RN, MN, PhD(c)

What Is a Family?, 274

Current Trends in the Canadian Family, 274

- Family Forms, 274
- Family Changes and Challenges: Understanding the
Influence of Sociocultural Contexts, 275

Teenage Pregnancy, 275

- Domestic Roles, 275
- Economic Status, 275
- Aboriginal Families, 275
- Family Caregivers, 275

The Family and Health, 276

- Attributes of Healthy Families, 276

Family Nursing Care, 277

- Family as Context, 277
- Family as Patient, 277
- Understanding Family in Context: Family Nursing as
Relational Inquiry, 277

Assessing the Challenges, Strengths, and Needs of the Family: The Calgary Family Assessment Model, 278

- Structural Assessment, 279
- Developmental Assessment, 282
- Functional Assessment, 282

Family Intervention: The Calgary Family Intervention Model, 284

- Asking Interventive Questions, 284
- Offering Commendations, 285
- Providing Information, 286
- Validating or Normalizing Emotional Responses, 286
- Encouraging Illness Narratives, 286
- Encouraging Family Support, 286
- Supporting Family Caregivers, 287
- Encouraging Respite, 287

Interviewing the Family, 287

20 Patient Education, 290

Original chapter by Amy M. Hall, RN, BSN, MS, PhD, CNE
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BN, MN, PhD

Goals of Patient Education, 291

- Maintaining and Promoting Health and Preventing
Illness, 291
- Restoring Health, 291
- Coping With Impaired Functioning, 291

Teaching and Learning, 292

- Role of the Nurse in Teaching and Learning, 292
- Teaching as Communication, 293

Domains of Learning, 293

- Cognitive Learning, 293
- Affective Learning, 294
- Psychomotor Learning, 294

Basic Learning Principles, 294

- Learning Environment, 294
- Ability to Learn, 294
- Learning Style and Preference, 295
- Motivation to Learn, 296

Integrating the Nursing and Teaching Processes, 297

- Assessment, 297
- Nursing Diagnosis, 298
- Planning, 299
- Implementation, 301
- Evaluation, 306

Unit V Caring Throughout the Lifespan**21 Developmental Theories, 309**

- Original chapter by Karen Balakas, RN, PhD, CNE
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Growth and Development, 310

- Physical Growth, 310
- Development, 310
- Factors Influencing Growth and Development, 310

Traditions of Developmental Theories, 310**Organicism, 311**

- Biophysical Developmental Theories, 311
- Cognitive Developmental Theories, 313
- Moral Developmental Theories, 313

Psychoanalytic and Psychosocial Tradition, 315

- Sigmund Freud, 315
- Erikson's Theory of Eight Stages of Life, 317
- John Bowlby, 319
- Patricia Crittenden, 319
- Havighurst's Developmental Tasks, 320

Mechanistic Tradition, 321**Contextualism, 321**

- Bioecological Theory, 321

Dialecticism, 322

- Keating and Hertzman's Population Health Theory, 322
- Resilience Theory, 323

Developmental Theories and Nursing, 323**22 Conception Through Adolescence, 326**

- Original chapter by Karen Balakas, RN, PhD, CNE
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Selecting a Developmental Framework for Nursing, 327**Conception, 327**

- Intrauterine Life, 327
- Health Promotion, 328

Transition From Intrauterine to Extrauterine Life, 328

- Physical Changes, 328
- Psychosocial Changes, 328
- Health Risks, 328

Newborn, 330

- Physical Changes, 330
- Cognitive Changes, 330
- Psychosocial Changes, 330

- Health Risks, 332
- Health Concerns, 332

Infant, 332

- Physical Changes, 332
- Cognitive Changes, 332
- Psychosocial Changes, 333
- Health Risks, 333
- Health Concerns, 335

Toddler, 339

- Physical Changes, 339
- Cognitive Changes, 340
- Psychosocial Changes, 340
- Health Risks, 340
- Health Concerns, 341

Preschooler, 341

- Physical Changes, 341
- Cognitive Changes, 341
- Psychosocial Changes, 344
- Health Risks, 344
- Health Concerns, 344

School-Age Children and Adolescents, 345**School-Age Child, 345**

- Physical Changes, 345
- Cognitive Changes, 348
- Psychosocial Changes, 348
- Health Risks, 349
- Health Concerns, 349

Adolescent, 352

- Physical Changes, 352
- Cognitive Changes, 354
- Psychosocial Changes, 355
- Health Risks, 356
- Health Concerns, 358

23 Young to Middle Adulthood, 361

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Young Adulthood, 362

- Physical Changes, 362
- Cognitive Changes, 362
- Psychosocial Changes, 362
- Hallmarks of Emotional Health, 364
- Social Support in Health and Illness, 364
- Health Risks, 364
- Health Concerns, 365

Middle Adulthood, 368

- Physical Changes, 368
- Cognitive Changes, 368
- Psychosocial Changes, 368
- Health Concerns, 370

24 Older Adulthood, 374

- Written by Wendy Duggleby, RN, PhD, AOCN
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Variability Among Older Adults, 375**Terminology, 375****Myths and Stereotypes, 375**

Nurses' Attitudes Toward Older Adults, 376**Theories of Aging, 376**

Developmental Tasks for Older Adults, 377

Aging Well and Quality of Life, 377**Community-Based and Institutional Health Care Services, 377****Assessing the Needs of Older Adults, 378**

Physiological Changes, 380

Functional Changes, 382

Cognitive Changes, 382

Psychosocial Changes, 384

Addressing the Health Concerns of Older Adults, 387

Health Promotion and Maintenance: Physiological

Health Concerns, 388

Health Promotion and Maintenance: Psychosocial

Health Concerns, 391

Older Adults and the Acute Care Setting, 392**Older Adults and Restorative Care, 393****Unit VI Psychosocial Considerations****25 Self-Concept, 396**

Original chapter by Victoria N. Folse, APN, PMHCN-BC, LCPC, PhD

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Scientific Knowledge Base, 397**Nursing Knowledge Base, 397**

Development of Self-Concept, 397

Components and Interrelated Terms of Self-Concept, 398

Stressors Affecting Self-Concept, 400

The Family's Effect on Development of Self-Concept, 403

The Nurse's Effect on the Client's Self-Concept, 403

Critical Thinking, 405**Self-Concept and the Nursing Process, 405**

Assessment, 405

Nursing Diagnosis, 407

Planning, 408

Implementation, 411

Evaluation, 412

26 Sexuality, 415

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Scientific Knowledge Base, 416

Sexual and Gender Identity, 416

Sexual Orientation, 416

Sexual Development, 416

Sexual Behaviour, 419

Sexually Transmitted Infections, 419

Contraception, 421

Abortion, 421

Nursing Knowledge Base, 422

Sociocultural Dimensions of Sexuality, 422

Discussing Sexual Issues, 423

Alterations in Sexual Health, 423

Patients With Particular Sexual Health Concerns, 424

Critical Thinking, 425**Sexuality and the Nursing Process, 426**

Assessment, 426

Nursing Diagnosis, 426

Planning, 427

Implementation, 430

Evaluation, 431

27 Spiritual Health, 433

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Historical Perspectives, 434**Spirituality and Health: Empirical Evidence, 434**

Mind–Body Connection and Psycho-Neuro-

Immunology, 435

Spirituality and Nursing Theory, 435**Conceptualizing Spirituality and Religion, 436****Spirituality and the Life Journey, 436****Critical Thinking, 438**

Understanding Patients' Spirituality, 438

Box 27-5: Procedural Guideline: Understanding a Patient's Spirituality, 439

Ethical Spiritual Care, 440

Providing Spiritual Care, 443

Facilitating Spiritual Practices, 444

Reflecting on Nurses' Spiritual Care, 444**28 The Experience of Loss, Death, and Grief, 447**

Original chapter by Valerie Yancey, RN, PhD

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Scientific Knowledge Base, 448

Loss, 448

Grief, 449

Nursing Knowledge Base, 451

Factors Influencing Loss and Grief, 451

Coping With Grief and Loss, 452

Critical Thinking, 453**The Nursing Process and Grief, 453**

Assessment, 453

Nursing Diagnosis, 458

Planning, 458

Implementation, 461

Box 28-10: Procedural Guideline: Care of the Body After Death, 468

Evaluation, 469

29 Stress and Adaptation, 472

Written by Marjorie Baier, RN, PhD, and Kathy Hegadoren, RN, PhD

Conceptualizations of Stress, 473

Physiological Conceptualizations, 473

Psychological Conceptualizations, 473

Stress Response Systems, 474

Sympathetic–Adrenal–Medullary System, 474

Hypothalamic–Pituitary–Adrenal Axis, 475

Stress and the Immune System, 475

The Relationship Between Type of Stressor and Health, 476

Stress-Related Disorders, 476

Nursing Knowledge Base, 477

Nursing Theory and the Role of Stress, 477

Situational, Maturation, and Sociocultural Factors, 477

Critical Thinking, 479

Nursing Process, 479

Assessment, 479

Nursing Diagnosis, 480

Planning, 481

Implementation, 484

Evaluation, 487

Unit VII Scientific Basis for Nursing Practice

30 Vital Signs, 489

Written by Shelley Jeske, RN, MN

Guidelines for Measuring Vital Signs, 490

Body Temperature, 491

Physiology, 491

Factors Affecting Body Temperature, 492

Nursing Process and Thermoregulation, 494

Assessment, 495

Skill 30-1: Measuring Body Temperature, 495

Box 30-5: Procedural Guideline: Measurement of Temporal Artery Temperature, 501

Box 30-6: Procedural Guideline: Use of a Glass Thermometer, 502

Nursing Diagnosis, 502

Planning, 503

Implementation, 503

Evaluation, 506

Pulse, 506

Physiology and Regulation, 506

Assessment of Pulse, 506

Skill 30-2: Assessing the Radial and Apical Pulses, 507

Character of the Pulse, 512

Nursing Process and Pulse Determination, 513

Respiration, 513

Physiological Control, 513

Mechanics of Breathing, 513

Assessment of Ventilation, 514

Skill 30-3: Assessing Respirations, 515

Assessment of Diffusion and Perfusion, 517

Skill 30-4: Measuring Oxygen Saturation (Pulse Oximetry), 518

Nursing Process and Respiratory Vital Signs, 520

Blood Pressure, 521

Physiology of Arterial Blood Pressure, 521

Factors Influencing Blood Pressure, 521

Hypertension, 522

Hypotension, 523

Measurement of Blood Pressure, 523

Skill 30-5: Measuring Blood Pressure, 524

Box 30-15: Procedural Guideline: Palpating the Systolic Blood Pressure, 530

Box 30-16: Procedural Guideline: Electronic Blood Pressure Measurement, 532

Nursing Process and Blood Pressure Determination, 533

Health Promotion and Vital Signs, 533

31 Health Assessment and Physical Examination, 537

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Social and Cultural Considerations, 538

Purposes of Physical Examination, 538

Gathering a Health History, 539

Developing Nursing Diagnoses and a Care Plan, 539

Managing Patient Problems, 539

Evaluating Nursing Care, 539

Skills of Physical Assessment, 539

Inspection, 539

Palpation, 540

Percussion, 540

Auscultation, 540

Olfaction, 541

Preparation for Examination, 541

Infection Control, 541

Environment, 542

Equipment, 542

Physical Preparation of the Patient, 542

Psychological Preparation of the Patient, 543

Assessment of Age Groups, 543

Organization of the Examination, 543

General Survey, 546

General Appearance and Behaviour, 546

Vital Signs, 548

Height and Weight, 548

The Integumentary System: Skin, Hair, and Nails, 550

Skin, 550

Hair and Scalp, 553

Nails, 555

Head and Neck, 557

Head, 557

Eyes, 559

External Eye Structures, 559

Position and Alignment, 559

Ears, 563

Nose and Sinuses, 565

Mouth and Pharynx, 568

Neck, 570

Thorax and Lungs, 573

Posterior Thorax, 574

Lateral Thorax, 577

Anterior Thorax, 577

Heart, 578

Inspection and Palpation, 580

Auscultation, 581

Vascular System, 582

Blood Pressure, 583

Carotid Arteries, 583

Jugular Veins, 584

Peripheral Arteries and Veins, 584

Lymphatic System, 589

Breasts, 589

Female Breasts, 589

Male Breasts, 594

Abdomen, 594

Inspection, 594

Auscultation, 596

Palpation, 597

Female Genitalia and Reproductive Tract, 597

Preparation of the Patient, 598

External Genitalia, 599

Speculum Examination of Internal Genitalia, 599

Male Genitalia, 600

Sexual Maturity, 601

Penis, 601

Scrotum, 601

Inguinal Ring and Canal, 602

Rectum and Anus, 603

Inspection, 603

Digital Palpation, 603

Musculoskeletal System, 603

General Inspection, 604

Palpation, 604

Range of Joint Motion, 604

Muscle Tone and Strength, 607

Neurological System, 608

Mental and Emotional Status, 609

Intellectual Function, 611

Cranial Nerve Function, 611

Sensory Function, 611

Motor Function, 613

Reflexes, 614

After the Examination, 615

Integration of Physical Assessment With Nursing Care, 615

32 Infection Control, 618

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Scientific Knowledge Base, 619

Chain of Infection, 619

Infectious Process, 622

Defences Against Infection, 622

Health Care–Associated Infections, 624

Nursing Process in Infection Control, 626

Assessment, 626

Nursing Diagnosis, 629

Planning, 630

Implementation, 632

Skill 32-1: Handwashing/Hand Hygiene, 636

Box 32-13: Procedural Guideline: Caring for a Patient on Isolation Precautions, 641

Box 32-15: Procedural Guideline: Donning a Surgical-Type Mask, 645

Skill 32-2: Preparation of a Sterile Field, 650

Skill 32-3: Surgical Handwashing/Hand Hygiene:

Preparing for Gowning, 652

Skill 32-4: Applying a Sterile Gown and Performing Closed Gloving, 655

Skill 32-5: Open Gloving, 657

Evaluation, 659

33 Medication Administration, 662

Written by Sharon Kaasalainen, RN, PhD

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Scientific Knowledge Base, 663

Pharmacological Concepts, 663

Medication Legislation and Standards, 664

Pharmacokinetics as the Basis of Medication Actions, 666

Types of Medication Action, 667

Medication Interactions, 668

Medication Dose Responses, 668

Routes of Administration, 669

Systems of Medication Measurement, 671

Nursing Knowledge Base, 672

Clinical Calculations, 672

Prescriber's Role, 675

Types of Orders, 676

Pharmacist's Role, 677

Distribution Systems, 677

Nurse's Role, 678

Critical Thinking, 679

Knowledge, 679

Experience, 679

Cognitive and Behavioural Attributes, 681

Standards, 681

Nursing Process and Medication Administration, 684

Assessment, 684

Nursing Diagnosis, 686

Planning, 686

Implementation, 686

Evaluation, 690

Medication Administration, 691

Oral Administration, 691

Topical Medication Applications, 692

Skill 33-1: Administering Oral Medications, 693

Box 33-16: Procedural Guideline: Giving Medications Through a Nasogastric Tube, Intestinal Tube, Gastrostomy Tube, or Small-Bore Feeding Tube, 698

Box 33-17: Procedural Guideline: Administering Nasal Instillations, 699

Skill 33-2: Administering Ophthalmic Medications, 700

Box 33-18: Procedural Guideline: Administering Ear Medications, 704

Administering Medications by Inhalation, 705

Box 33-19: Procedural Guideline: Administering Vaginal Medications, 705

Box 33-20: Procedural Guideline: Administering Rectal Suppositories, 707

Skill 33-3: Using Metered-Dose or Dry Powder Inhalers, 708

Administering Medications by Irrigations, 711

Administering Parenteral Medications, 711

Skill 33-4: Preparing Injections, 714

Box 33-23: Procedural Guideline: Mixing Two Kinds of Insulin in One Syringe, 721

Administering Injections, 721

Skill 33-5: Administering Injections, 722

Skill 33-6: Adding Medications to Intravenous Fluid Containers, 727

Skill 33-7: Administering Medications by Intravenous Bolus, 737

Skill 33-8: Administering Intravenous Medications by Piggyback, Intermittent Intravenous Infusion Sets, and Mini-Infusion Pumps, 742

Box 33-26: Procedural Guideline: Subcutaneous Butterfly Catheters and Hypodermoclysis, 748

34 Complementary and Alternative Therapies, 751

Written by Jean McClennon-Leong, RN, MN, FNP-BC, APNP

Complementary and Alternative Medicine Therapies in Health Care, 752

Public Interest in Complementary and Alternative Medicine Therapies, 752

Complementary and Alternative Medicine Therapies and Holistic Nursing, 755

Nursing-Accessible Therapies, 756

Relaxation Therapy, 757

Meditation and Breathing, 759

Imagery, 759

Training-Specific Therapies, 760

Biofeedback, 760

Therapeutic Touch, 761

Chiropractic Therapy, 761

Traditional Chinese Medicine, 762

Acupuncture, 762

Role of Nutrition in Disease Prevention and Health Promotion, 762

Herbal Therapies, 763

Clinical Applications of Natural Health Products (NHPs), 764

Nursing Role in Complementary and Alternative Therapies, 766

Unit VIII Basic Physiological Needs

35 Activity and Exercise, 769

Written by Donna J. Gill, RN(EC), BScN, MSc, CRN(C)

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Scientific Knowledge Base, 770

Physiology of Movement, 770

Principles of Body Mechanics, 773

Pathological Influences on Body Mechanics and Movement, 774

Exercise and Activity, 774

Nursing Knowledge Base, 775

Developmental Changes, 775

Behavioural Aspects, 775

Environmental Issues, 776

Cultural and Ethnic Influences, 776

Family and Social Support, 777

Critical Thinking, 777

Nursing Process, 777

Assessment, 777

Nursing Diagnosis, 779

Planning, 779

Implementation, 781

Evaluation, 787

36 Safety, 790

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Scientific Knowledge Base, 790

Environmental Safety, 790

Nursing Knowledge Base, 793

Risks at Developmental Stages, 793

Individual Risk Factors, 794

Risks in the Health Care Agency, 794

Critical Thinking, 796

Safety and the Nursing Process, 797

Assessment, 797

Nursing Diagnosis, 799

Planning, 799

Implementation, 801

Box 36-7: Procedural Guideline: Interventions for Accidental Poisoning, 805

Skill 36-1: Applying Physical Restraints, 815

Evaluation, 820

Skill 36-2: Seizure Precautions, 821

37 Hygiene, 825

Original chapter by Deborah Marshall, MSN

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Scientific Knowledge Base, 825

The Skin, 826

The Feet, Hands, and Nails, 826

The Oral Cavity, 827

The Hair, 827

The Eyes, Ears, and Nose, 827

Nursing Knowledge Base, 827

Social Practices, 828

Personal Preferences, 828

Body Image, 828

Socioeconomic Status, 828

Health Beliefs and Motivation, 828

Cultural Variables, 828

Physical Condition, 828

Critical Thinking, 829

Nursing Process, 829

Assessment, 829

Nursing Diagnosis, 837

Planning, 838

Implementation, 841

Skill 37-1: Bathing a Patient, 843

Skill 37-2: Performing Nail and Foot Care, 852

Skill 37-3: Providing Oral Hygiene, 856

Skill 37-4: Performing Mouth Care for an Unconscious or Debilitated Patient, 858

Box 37-12: Procedural Guideline: Care of Dentures, 860

Box 37-13: Procedural Guideline: Shampooing the Hair of a Bed-Bound Patient, 862

Skill 37-5: Making an Occupied Bed, 868

Evaluation, 873

Box 37-16: Procedural Guideline: Making an Unoccupied Bed, 874

38 Cardiopulmonary Functioning and Oxygenation, 877

Original chapter by Paulette M. Archer, RN, EdD

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Scientific Knowledge Base, 878

Cardiovascular Physiology, 878

Respiratory Physiology, 880

Factors Affecting Oxygenation, 882

Alterations in Cardiac Functioning, 884

Alterations in Respiratory Functioning, 887

Nursing Knowledge Base, 887

Developmental Factors, 887

Lifestyle Risk Factors, 888

Environmental Factors, 889

Critical Thinking, 889

Nursing Process, 890

Assessment, 890

Nursing Diagnosis, 894

Planning, 896

Implementation, 899

Skill 38-1: Suctioning, 905

Skill 38-2: Care of an Artificial Airway, 913

Skill 38-3: Care of Patients With Chest Tubes, 921

Skill 38-4: Applying a Nasal Cannula or Oxygen Mask, 925

Skill 38-5: Using Home Oxygen Equipment, 929

Evaluation, 933

39 Fluid, Electrolyte, and Acid-Base Balances, 936

Written by Darlaine Jantzen, RN, MA, PhD

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Scientific Knowledge Base, 937

Distribution of Body Fluids, 937

Composition of Body Fluids, 937

Movement of Body Fluids, 938

Regulation of Body Fluids, 938

Regulation of Electrolytes, 940

Regulation of Acid-Base Balance, 941

Disturbances in Electrolyte, Fluid, and Acid-Base Balances, 942

Types of Acid-Base Imbalances, 945

Knowledge Base of Nursing Practice, 945

Critical Thinking, 947

Nursing Process, 947

Assessment, 947

Nursing Diagnosis, 954

Planning, 954

Implementation, 955

Skill 39-1: Initiating a Peripheral Intravenous Infusion, 959

Skill 39-2: Regulating Intravenous Flow Rates, 974

Skill 39-3: Maintenance of Intravenous System, 978

Skill 39-4: Changing a Peripheral Intravenous Dressing, 983

Evaluation, 987

40 Sleep, 992

Original chapter by Patricia A. Stockert, RN, BSN, MS, PhD

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Scientific Knowledge Base, 993

Definition of Sleep, 993

Physiology of Sleep, 993

Functions of Sleep, 995

Physical Illness, 995

Sleep Disorders, 996

Nursing Knowledge Base, 999

Sleep and Rest, 999

Normal Sleep Requirements and Patterns, 1000

Factors Affecting Sleep, 1001

Critical Thinking, 1002

Nursing Process, 1003

Assessment, 1003

Nursing Diagnosis, 1005

Planning, 1006

Implementation, 1010

Evaluation, 1014

41 Pain Assessment and Management, 1017

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Scientific Knowledge Base, 1018

Nature of Pain, 1018

Physiology of Pain, 1018

Types of Pain, 1021

Nursing Knowledge Base, 1022

Knowledge, Attitudes, and Beliefs, 1022

Factors Influencing Pain, 1023

Critical Thinking, 1026

Nursing Process and Pain, 1026

Assessment, 1026

Nursing Diagnosis, 1032

Planning, 1033

Implementation, 1036

Box 41-13: Procedural Guideline: Massage, 1038

Evaluation, 1046

42 Nutrition, 1050

Written by Kathryn Weaver, RN, PhD

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Scientific Knowledge Base, 1051

Nutrients: The Biochemical Units of Nutrition, 1051
Anatomy and Physiology of the Digestive System, 1053
Dietary Guidelines, 1056

Nursing Knowledge Base, 1059

Nutrition During Human Growth and
Development, 1059
Alternative Food Patterns, 1065

Critical Thinking, 1067**Nursing Process and Nutrition, 1067**

Assessment, 1067
Nursing Diagnosis, 1072
Skill 42-1: Aspiration Precautions, 1072
Planning, 1074
Implementation, 1077
Evaluation, 1081

Self-Monitoring of Blood Glucose, 1081**Enteral Tube Feeding, 1082**

Skill 42-2: Blood Glucose Monitoring, 1082
Initiating Enteral Tube Feedings, 1087
*Skill 42-3: Inserting a Small-Bore Nasoenteric or
Oral Tube for Enteral Feeding, 1088*
*Skill 42-4: Administering Enteral Feedings via
Nasoenteric Tube, 1093*
*Skill 42-5: Administering Enteral Feedings via
Gastrostomy or Jejunostomy Tube, 1097*
Preventing Complications, 1099
*Box 42-13: Procedural Guideline: Discontinuing
Enteral Feedings via Nasogastric Tube, 1100*

**Large-Bore Tube and Nasogastric or Orogastric
Suctioning, 1100**

*Box 42-15: Procedural Guideline: Obtaining
Gastrointestinal Aspirate for pH Measurement,
Large- and Small-Bore Feeding Tubes:
Intermittent and Continuous Feeding, 1101*
*Box 42-17: Procedural Guideline: Providing
Suction, 1104*
*Skill 42-6: Inserting a Large-Bore Nasoenteric or
Orogastric Tube for Gastric Suctioning, 1104*
Medication, 1107

Parenteral Nutrition, 1107

Initiating Parenteral Nutrition, 1107
Preventing Complications, 1108

43 Urinary Elimination, 1112

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Scientific Knowledge Base, 1113

Upper Urinary Tract, 1113
Lower Urinary Tract, 1114
Act of Urination, 1115
Factors Influencing Urination, 1115
Common Alterations in Urinary Elimination, 1117

Nursing Knowledge Base, 1119

Infection Control and Hygiene, 1119
Growth and Development, 1119
Psychosocial and Cultural Considerations, 1120

Critical Thinking, 1120**Nursing Process and Alterations in Urinary
Function, 1120**

Assessment, 1120
*Skill 43-1: Collecting a Midstream (Clean-Voided)
Urine Specimen, 1125*
Nursing Diagnosis, 1130
Planning, 1130
Implementation, 1133
*Skill 43-2: Inserting a Straight or In-Dwelling
Catheter, 1139*
Skill 43-3: In-Dwelling Catheter Care, 1147
*Skill 43-4: Closed and Open Catheter
Irrigation, 1149*
*Box 43-11: Procedural Guideline: Condom
Catheter, 1153*
Evaluation, 1156

44 Bowel Elimination, 1159

Original chapter by Lori Klingman, RN, MSN

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Scientific Knowledge Base, 1160

Mouth, 1160
Esophagus, 1160
Stomach, 1160
Small Intestine, 1161
Large Intestine, 1162
Anus and Rectum, 1162

Nursing Knowledge Base, 1163

Process of Defecation, 1163
Factors Affecting Normal Bowel Elimination, 1164

Critical Thinking, 1165**Nursing Process and Bowel Elimination, 1165**

Assessment, 1165
*Box 44-1: Procedural Guideline: Measuring Fecal
Occult Blood, 1170*
Nursing Diagnosis, 1171
Planning, 1175
Implementation, 1176
Skill 44-1: Administering a Cleansing Enema, 1182
*Box 44-10: Procedural Guideline: Digital Removal
of Stool, 1185*
Evaluation, 1188
Skill 44-2: Pouching an Ostomy, 1189

Unit IX Patients With Special Needs**45 Mobility and Immobility, 1195**

Written by Donna J. Gill, RN(EC), BScN, MSc, CRN(C)

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Scientific Knowledge Base, 1196

Physiology and Principles of Body Mechanics, 1196
Regulation of Movement, 1196

Pathological Influences on Mobility, 1196

Nursing Knowledge Base, 1198

Mobility–Immobility, 1198

Critical Thinking, 1202

Nursing Process for Impaired Body Alignment and Mobility, 1202

Assessment, 1203

Nursing Diagnosis, 1212

Planning, 1213

Implementation, 1216

Box 45-7: Procedural Guideline: Application of Sequential Compression Stockings, 1218

Box 45-8: Procedural Guideline: Application of Elastic Stockings, 1219

Skill 45-1: Moving and Positioning Patients in Bed, 1223

Skill 45-2: Using Safe and Effective Transfer Techniques, 1233

Evaluation, 1246

46 Skin Integrity and Wound Care, 1250

Written by Rosemary Kohr, RN, MScN, PhD, Tertiary Care Nurse Practitioner Certificate (UWO, 1998)

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Scientific Knowledge Base, 1251

Skin, 1251

Pressure Ulcers, 1251

Nursing Knowledge Base, 1253

Prediction and Prevention of Pressure Ulcers, 1253

Skill 46-1: Assessment for Risk of Pressure Ulcer Development, 1254

Critical Thinking, 1257

Nursing Process, 1258

Assessment, 1258

Nursing Diagnosis, 1271

Planning, 1272

Implementation: Preventing Skin Breakdown, 1274

Skill 46-2: Treating Pressure Ulcers, 1278

Skill 46-3: Applying Dry and Moist Dressings, 1282

Skill 46-4: Performing Wound Irrigation, 1291

Skill 46-5: Applying an Abdominal or Breast Binder, 1295

Skill 46-6: Applying an Elastic Bandage, 1296

Evaluation, 1298

47 Sensory Alterations, 1301

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Scientific Knowledge Base, 1302

Normal Sensation, 1302

Sensory Alterations, 1303

Nursing Knowledge Base, 1305

Factors Affecting Sensory Function, 1305

Critical Thinking, 1306

Nursing Process, 1307

Assessment, 1307

Nursing Diagnosis, 1311

Planning, 1311

Implementation, 1312

Evaluation, 1322

48 Care of Surgical Patients, 1325

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History of Surgical Nursing, 1326

Same-Day (Ambulatory) Surgery, 1327

Scientific Knowledge Base, 1327

Classification of Surgery, 1327

Nursing Knowledge Base, 1327

Critical Thinking, 1327

The Nursing Process in the Preoperative Surgical Phase, 1328

Assessment, 1329

Nursing Diagnosis, 1338

Planning, 1338

Implementation, 1341

Skill 48-1: Demonstrating Postoperative Exercises, 1343

Evaluation, 1354

Transport to the Operating Room, 1355

Intraoperative Surgical Phase, 1355

Preoperative (Holding) Area, 1355

Admission to the Operating Room, 1355

The Nursing Process in the Intraoperative Surgical Phase, 1355

Assessment, 1355

Nursing Diagnosis, 1356

Planning, 1356

Implementation, 1356

Evaluation, 1357

Postoperative Surgical Phase, 1357

Immediate Postoperative Recovery, 1357

Discharge From the Postanaesthesia Care Unit, 1358

Recovery in Ambulatory Surgery, 1359

Postoperative Convalescence, 1359

The Nursing Process in Postoperative Care, 1359

Assessment, 1360

Nursing Diagnosis, 1362

Planning, 1362

Implementation, 1363

Evaluation, 1368

Appendix A: Practical Nursing in Canada, 1371

Appendix B: Laboratory Values, 1388

References, 1400

Review Question Rationales, 1455

Index, 1475

Preface to the Student

Canadian Fundamentals of Nursing provides you with all of the fundamental nursing concepts and skills you will need in a visually appealing, easy-to-use format. As you begin your nursing education, it is very important that you have a resource that includes all of the information required to prepare you for lectures, classroom activities, clinical assignments, and examinations. We've designed this text to meet all of those needs.

Check out the following special learning aids featured in *Canadian Fundamentals of Nursing*.

Learning Objectives begin each chapter to help you focus on the key information that follows.

1 Health and Wellness

Written by Linda Reutter, RN (Ret.), PhD, and Kaysi Eastlick Kushner, RN, PhD

objectives

Mastery of content in this chapter will enable you to:

- Define the key terms listed.
- Discuss ways that definitions of health have been conceptualized.
- Describe key characteristics of medical, behavioural, and socioenvironmental approaches to health.
- Identify factors that have led to each approach to health.
- Discuss contributions of the following Canadian publications to conceptualizations of health and health determinants: *Lalonde Report*, *Ottawa Charter*, *Epp Report*, *Strategies for Population Health*, *Jakarta Declaration*, *Bangkok Charter*, *Toronto Charter*.
- Discuss key health determinants and their interrelationships and how they influence health.
- Contrast distinguishing features of health promotion and disease prevention.
- Describe the three levels of disease prevention.
- Identify and give examples of the five health promotion strategies discussed in the *Ottawa Charter*.
- Analyze how the nature and scope of nursing practice are influenced by different conceptualizations of health and health determinants.

media resources

Evolve WEBSITE

<http://evolve.elsevier.com/Canada/Potter/fundamentals/>

- Audio Chapter Summaries
- Examination Review Questions
- Glossary
- Student Learning Activities
- Test-Taking Skills
- Weblinks

Key Terms are listed at the beginning of each chapter and are boldfaced and defined in the text. Page numbers help you quickly find where each term is defined.

key terms

- Behavioural approach, p. 3
- Behavioural risk factors, p. 3
- Determinants of health, p. 7
- Disease, p. 2
- Disease prevention, p. 10
- Health, p. 2
- Health as actualization, p. 2
- Health as actualization and stability, p. 2
- Health as stability, p. 2
- Health disparities, p. 6
- Health field concept, p. 3
- Health promotion, p. 10
- Health promotion strategies, p. 11
- Population health approach, p. 5
- Prerequisites for health, p. 4
- Psychosocial risk factors, p. 4
- Social determinants of health, p. 6
- Socioenvironmental approach, p. 4
- Socioenvironmental risk conditions, p. 4
- Wellness, p. 2

Evolve Resources detail what electronic resources are available to you for every chapter.

Concepts of health and what determines health have changed significantly since the 1970s. This conceptual change has major implications for Canadian nursing in the twenty-first century because how you perceive health—and what determines it—influences the nature and scope of nursing practice. The importance of health to nursing is reflected in nursing models and frameworks, in which health is one of the “metaparadigm” concepts along with *person*, *environment*, *nursing*, and, more recently, *social justice* (see Chapter 4). In each framework, health concepts are congruent with the assumptions and focus of the model.

✦ REVIEW QUESTIONS

- Canada has undertaken an effort to reduce wait times, reduce duplication of tests, and support coordination of care through which agency?
 1. Canada e-Health
 2. Canada Infloway
 3. Canada m-Health
 4. Electronic Health Records
2. Which of the following people are insured under the *Canada Health Act*?
 1. Aboriginal peoples
 2. RCMP members
 3. Members of military services
 4. Persons in transit between provinces
3. Public health focuses on
 1. Treatment
 2. Promotion
 3. Intervention
 4. Institutionalization
4. The *Canada Health Act* embraces the following five principles:
 1. Public administration, comprehensiveness, universality, portability, accessibility
 2. Social justice, equity, acceptability, efficiency, effectiveness
 3. Accountability, equality, economy, collaboration, coordination
 4. Insured health services, provider compensation, hospital services, community care, and pharmaceuticals
5. An adult day support program is an example of a(n)
 1. Home care agency
 2. Institutional agency
 3. Community agency
 4. Ambulatory care centre
6. What are the five levels of health care services?
 1. Promotive, preventive, curative, rehabilitative, supportive
 2. Prevention, protection, diagnosis, treatment, palliative care
 3. Promotion, prevention, treatment, PHC, diagnosis
 4. Assessment, diagnosis, planning, implementation, evaluation
7. Which trend is most critical in the future health human resources planning?
 1. Keeping sufficient physicians
 2. Ensuring adequate providers in rural and remote areas
 3. Ensuring ethical recruitment and retention
 4. Increasing number of health providers to respond to emerging health needs
8. Which is not a cause of Canada's increasing health care costs?
 1. Workplace injuries
 2. Aging population
 3. New technologies and pharmaceuticals
 4. Chronic and emerging diseases

9. A nurse organizes a blood pressure screening program as a _____ strategy.
1. Health promotion
 2. Disease prevention
 3. Continuing care
 4. Rehabilitation
10. Provision of specialized medical services by a physician specialist or a hospital is _____.
1. Primary care
 2. Primary health care
 3. Secondary care
 4. Tertiary care

RECOMMENDED WEB SITES

Canadian Health Services Research Foundation: Research Theme: Primary Health Care: http://www.chsrf.ca/research_themes/ph_e.php

This site addresses initiatives of the foundation that relate to PHC reform and research.

Canada Health Infoway: <https://www.infoway-inforoute.ca/>

A not-for-profit corporation created by Canada's First Ministers to foster and accelerate development and adoption of EHR systems with compatible standards and communication technologies.

Canadian Institute of Health Information: <http://www.cihi.ca>
A not-for-profit organization seeking to improve the health care system and the health of Canadians by providing health information.

Canadian Public Health Association: <http://www.cpha.ca>

A national, not-for-profit association seeking excellence in public health nationally and internationally.

Health Canada: <http://www.hc-sc.gc.ca>

This site provides links to information about the Canadian health care system, such as the *Canada Health Act* legislation, and federal reports.

Canadian Patient Safety Institute: <http://www.patient-safetyinstitute.ca>

This institute was established to build and advance a safer health care system for Canadians. It reports on activities in leadership across health sectors and health care systems, highlights promising practices, and raises awareness with stakeholders and the public about patient safety.

Health Quality Council (Saskatchewan): <http://www.hqc.sk.ca>
The Saskatchewan Health Quality Council was established in 2002 through provincial legislation to improve health care in Saskatchewan by encouraging the use of best evidence.

Health Council of Canada: <http://www.healthcouncilcanada.ca/>
The Health Council of Canada fosters accountability and transparency by assessing, monitoring, and reporting progress in improving quality, effectiveness, and sustainability of the health care system for the well-being of Canadians.

Review Questions Answers

1. 2; 2. 4; 3. 2; 4. 1; 5. 3; 6. 1; 7. 3; 8. 1; 9. 2; 10. 3

Rationales for the Review Questions appear at the end of the book.

diverse range of environments, a situation that challenges quality issues and affects recruitment and retention. Sustainable and quality workforces, organizational efficiencies, and improved patient care are related to improved work environments (Health Canada, 2010c). The Pan-Canadian Health Human Resource Strategy (PC HHRS) articulates approaches to enhancing work and learning conditions necessary to maintain an experienced, dedicated and skilled workforce for high quality, safe, and timely care (Health Canada, 2010c).

Privatization of Services. Governments are struggling to maintain the principle of universality against the benefits and challenges of privatization. At present, not all health care services are available and accessible to all Canadians. For example, infertility treatments and laser eye surgical procedures are performed in private offices, available to clients who can afford them. Discussions persist about what constitutes "medically necessary services" and what makes up universal "core services," with many experts contending that the survival of medicare depends on privatizing more parts of the health care system.

Health Care Human Resources. In 2006, more than 1 million people (about 6% of the total workforce) in Canada worked directly in health-related occupations (Chui et al., 2007). Despite these numbers, accessibility to health care services is compromised by shortages of physicians, nurses, and other health care professionals. Health Canada (2010c) states health and human resources planning must occur within the broader health care system, recognizing systemic challenges of wait times, patient safety, and bed closures.

Aboriginal peoples are significantly under-represented in health professions. Health Canada established a five-year initiative, known as the Aboriginal Health Human Resources Initiative (AHHRI), focusing on increasing Aboriginal representation in health professions and retention of health care providers successfully working with Aboriginal peoples as part of the PC HHRS. The AHHRI-Phase II was extended in December 2010.

Review Questions at the end of each chapter help you review and evaluate what you have learned. Answers and rationales are provided at the back of the book.

Recommended Web Sites list up-to-date online resources and are annotated to give you some information about each.

Key Concepts appear at the end of each chapter to help you review important content.

The Canadian Health Care Delivery System 27

Nursing's Future in the Emerging Health Care System

This chapter provided extensive discussion about restructuring and challenges within the Canadian health care system. Within the context of restructuring and complexities within the Canadian system, nursing roles continue to evolve and diversify. In the future, nurses will increasingly be regarded as critical stakeholders, partners, and providers within the emerging health care system. Nurses will continue to draw on their historical legacy, forge ahead, and use evidence to inform their pursuit of excellence and quality in care, while advocating and innovating for the benefit of their clients.

KEY CONCEPTS

- Medicare is a key component of Canada's social safety net.
- Government plays a major role in the Canadian health care system by co-funding national health insurance and by setting health care policy in accordance with the *Canada Health Act*.
- The *Canada Health Act* forbids extra billing and user fees while articulating the principles of public administration, comprehensiveness, universality, portability, and accessibility.
- Health care services are provided in institutional, community, and home settings; across all age groups; and for individual, family, group, community, and population clients.
- Five levels of health care are promotive, preventive, curative, rehabilitative, and supportive.
- Escalating costs and consumer expectations challenge the health care system to seek and deliver innovative, efficient, and quality care.
- Issues of equality, access, interprofessional approaches, and continuity of care challenge the health care system.
- The rise of PHC and home care is a result of health care reforms.
- Successful health promotion and disease prevention programs help clients achieve healthier lifestyles and achieve a decent standard of living.
- Demographic, geographical, and technological realities affect the functioning and restructuring of the Canadian health care system.
- The existence of sufficient, diverse, and qualified human health resources is a key challenge to the Canadian health care system.
- Enhancing the health of Aboriginal peoples in Canada is a significant challenge to society and to the health care system.
- Nurses must continually seek out information and evidence to remain responsive to providing quality, culturally competent, and safe care.

CRITICAL THINKING EXERCISES

1. Debate the following issues respecting the future of the Canadian health care system: escalating costs, privatization, continuity of care, electronic health records.
2. Consider and describe how the national economy and technology have changed the Canadian health care system. What are the implications for nursing?
3. Mr. W., a 68-year-old widower with no immediate family supports, is scheduled to have major surgery to replace the joint in his hip. He is generally in good health and lives in a seniors-only apartment complex in the centre of town. After surgery, he will need extensive therapy in order to walk. Describe the types of health care services, patient safety issues, and technological supports that might play a part in his care.

Critical Thinking Exercises encourage you to think creatively and effectively to apply essential content.

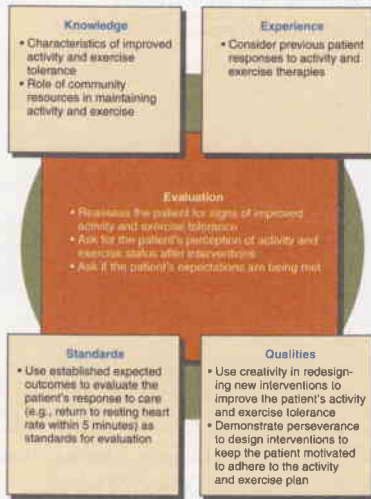


Figure 35-9 Critical thinking model for activity and exercise evaluation.

- The best program of physical activity includes a combination of exercises that produce different physiological and psychological benefits.
- Coordinated body movement to move, lift, bend, stand, sit, lie down, and complete daily activities requires integrated functioning of the skeletal system, skeletal muscles, and nervous system.
- Muscles primarily associated with movement are located near the skeletal region, where movement results from leverage, which is characteristic of the upper extremities.
- Coordination and regulation of muscle groups depend on muscle tone and activity of antagonistic, synergistic, and anti-gravity muscles.
- Balance is assisted by nervous system control in the cerebellum and by inner ear function.
- Body balance is achieved when a wide base of support exists, the centre of gravity is within the base of support, and the centre of gravity is vertically aligned with the base of support.
- Developmental changes, behavioural aspects, environmental issues, cultural and ethnic influences, and family and social support affect the patient's perception of and motivation to engage in physical activity and exercise.
- Ability to engage in normal physical activity and exercise depends on intact and functioning nervous and musculoskeletal systems.
- Use the nursing process to provide care for patients who are experiencing or are at risk for activity intolerance and impaired physical mobility.

BOX 35-16 NURSING STORY

Activity and Exercise

I have been in nursing for over 40 years. For more than 30 years of that time, before moving into teaching, I worked as a hospital staff nurse providing direct care to patients. I worked mainly in areas where patients were unable to assist themselves very much, such as in the birthing and critical care units. As is the case with most nurses, the wear and tear of lifting, turning, and transferring patients took a toll on my body, primarily on my back, knees, and feet. But for as long as it was part of my role, I was able to do work.

Several years later, after I began teaching a nursing fundamentals course, my physical activity related to nursing consisted of demonstrating fundamental skills in the laboratory setting and of providing assistance to students with their practice. During my fifth year of teaching that course, I was taken by surprise at how difficult I found it to lift, position, or transfer my volunteer "patients," and at how extremely tired and sore I was at the end of each day. What was happening to me?

Upon reflection, I realized that two factors were involved. The first was normal change resulting from aging: the decrease in strength and endurance that occurs after age 40 among women. The second factor was the relatively sedentary lifestyle I had led since I had left bedside nursing. Mine was a classic case of functional decline from disuse, a major concern as aging occurs. As I thought further about it, I remembered that I had noticed groceries becoming heavier and stair climbing feeling more difficult. At the rate I was changing, I had little hope of maintaining my independence well into old age. In the shorter term, if I expected to keep teaching for a few more years, I would need to do something about my fitness level quickly!

My strategies? To use my gym membership (neglected for months and never attended routinely) four times per week from June through August and at least three times per week throughout the academic year, and to walk for no less than 30 minutes every day. No more avoiding stairs, either! I decided to walk up one floor and down two

The unique **Critical Thinking Model** clearly shows how the nursing process and critical thinking come together to help you provide the best care for your patients.

Concept Maps show you the association among multiple nursing diagnoses and their relationship to medical diagnoses.

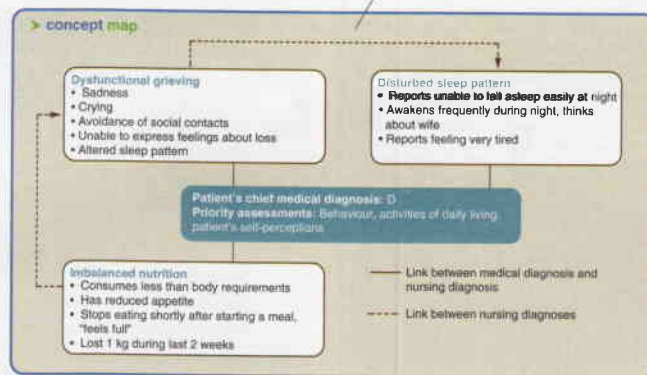


Figure 26-4 Concept map for a patient with depression after the death of his wife.

As a result of the patient's medical condition, associated health problems include the nursing diagnoses *dysfunctional grieving*, *disturbed sleep pattern*, and *imbalanced nutrition: less than body requirements*. You must determine which of the three diagnoses necessitates greater attention. The continuing grief experienced by the patient might be the focus. Until the patient is able to accept his loss and begin resolving his grief, he may be unable to attend to interventions that will improve his nutritional intake and sleep status.

Patients' conditions always change. In the ongoing assessment of a patient's condition, you can quickly discover a new problem. You must always consider which of the patient's most urgent physical or psychological needs require immediate intervention. You consider the patient's expectations and preferences in regard to the priorities of care. If a terminally ill patient's priorities include controlling pain and maintaining self-esteem, pain control is the priority when analgesics become ineffective and the patient experiences acute distress. If the patient is progressing as desired, you may refocus priorities to address unmet needs. For example, the patient suffering depression caused by his wife's death also has problems of imbalanced nutrition and disturbed sleep pattern. If the patient reports improved appetite and has shown weight stabilization since the last clinic visit, you can focus more attention on the sleep pattern disturbance. You must remember that the patient's expectations, clinical condition, and preferences influence priorities. If a terminally ill patient places more emphasis on spiritual support than on other priorities such as learning about planned treatments, you must attend to the patient's priorities. Meeting patient priorities may allow you to then address other needs more effectively with less effort.

Continuity of Care

Primary teams help identify and meet the needs of patients experiencing losses. Dietitians, clergy, physicians, nurses, physiotherapists, psychologists, chaplains, and other health care providers can assist a patient and

family in their grief. A coordinated team approach to managing a patient's needs results in a well-managed care plan. When a patient dies, the loss that you and your colleagues experience can be shared within the interprofessional group. Support is needed to promote healing for all who worked with the dying patient and the family. Conflicts and differences can be discussed openly and solutions found in a healthy manner with the patient as the primary focus. For example, ethical conflicts may have arisen related to proposed or performed medical treatments or interventions. Through working together, the sharing of experiences, feelings, alternatives, and solutions becomes the basis for dealing with future losses.

Many terminally ill patients return home and require continued intensive nursing care. Home care nurses collaborate closely with family members to meet the patient's ongoing needs. Important interventions to include in planning a return home are arranging for main-floor access, arranging appropriate medical equipment, and providing sufficient family respite. When it is realistic for the patient to remain independent, therapeutic strategies should bolster the patient's sense of autonomy and the ability to function as independently as possible (Smith & Kautz, 2007). For example, judicious application of orthotic devices, along with physiotherapy and occupational therapy, can often bolster a patient's functional capacity. In the home, safety issues related to the environment may exist, and patients often benefit from nurse-initiated referrals to community occupational therapists.

Implementation

Health Promotion

Although a return to full function is not an expected outcome for a terminally ill patient or even for a patient who has significant disability, optimal physical and emotional functioning is a realistic goal. The goal of nursing care is to help patients and families cope with the stressors in their lives and to achieve healthy grief resolution. You help patients and families in

The five-step **Nursing Process** provides a consistent framework for presentation of content in clinical chapters.

In Canada, the CNA (2010a) advocates in its position statement that culturally competent care can and should be practised in all clinical settings. The "underlying values for cultural competence are inclusivity, respect, valuing differences, equity and commitment" (Registered Nurses' Association of Ontario, 2007, p. 19). Cultural competence is viewed as a key concept in the application of knowledge, skill, attitudes, and personal attributes by nurses in the provision of appropriate care and services in relation to the cultural characteristics of patients. A nurse practising in this way, for instance, would hold the belief of valuing diversity, be interested in and seek out knowledge as appropriate about cultural mores and traditions from diverse patients being served, and be sensitive to these while caring for the cultural diverse person. Although nurses are responsible for providing culturally competent care, nursing regulatory bodies, professional associations, educational institutions, governments, health service agencies, and accreditation organizations share the responsibility of supporting culturally competent care. You are in a position to build partnerships with other health care providers, patients, and funding agencies in order to establish culturally diverse practices that optimize patients' health outcomes.

The provision of culturally competent care has been promoted since the 1960s. Only since 2000, however, have Canadian nurse scholars begun to question the limitations of such an approach (Anderson et al., 2003; Kirkham, 2003) and to examine, critically, the concept of **cultural safety** as another approach to providing care to diverse groups, in contrast to the conceptual notion of transcultural nursing (Ramsden, 2002). The College of Registered Nurses of British Columbia's (2006) profile of newly graduated registered nurse practice focuses on the therapeutic caring and culturally safe relationships between patients and health care team members. The cultural safety literature is framed within a critical social theory and postcolonial framework. The concept of cultural safety evolved over a number of years in New Zealand, as nurses tried to identify a way in which health care providers could more effectively address the inequity in the health status of Maori people. This was combined with an analysis of the historical, political, social, and economic situations influencing the health of Maori people (Ramsden, 2002). Cultural safety involves considering the redistribution of power and resources in a relationship. The notion "is based on the premise that the term 'culture' is used in its broadest sense to apply to any person or group of people who may differ from the nurse, midwife because of socio-economic status, age, gender, sexual orientation, ethnic origin, migrant/refugee status, religious belief or disability" (Ramsden, 2002, Chapter 8, p. 3). In contrast to transcultural nursing, the term *culture* refers to ethnicity. As a result, the philosophy of cultural care has shifted from a notion of cultural sensitivity underpinning the provisions of care irrespective of culture to one of cultural safety with the recognition of power imbalances, the understanding of the nature of interpersonal relationships, and the awareness of institutional discrimination (Baker, 2007; Browne & Finkle, 2001; Brown et al., 2009; CNA, 2010a; Racine, 2009) (Box 9-3). Thus, understanding and providing culturally competent and safe care have the potential to make a difference to the health of many culturally diverse groups, especially Canada's Aboriginal population of First Nations, Inuit, and Métis peoples.

Ramsden (2002) articulated that *cultural awareness* and *cultural sensitivity* are separate concepts and that those terms are not interchangeable with *cultural safety*. Achieving cultural

BOX 9-3 RESEARCH HIGHLIGHT

Globalization and the Cultural Safety of an Immigrant Muslim Community

Research Focus

The social health of Muslims who reside in smaller areas of Canada is not clearly understood by health care providers. The concept of cultural safety has been used in studies of both Aboriginal peoples and immigrants in a large metropolitan centre, but the dichotomy between culturally safe and unsafe groups was found to be blurred. To further understand the concept of cultural safety, Baker (2007) focused on the social health of a small immigrant community of Muslims in a relatively homogeneous region of Canada after the terrorist attacks in the United States on September 11, 2001 ("9/11").

Research Abstract

Many Muslims living in North America and Western Europe were negatively affected by the events of 9/11. A qualitative approach based on the constructivist paradigm was used to guide the study, and 26 in-depth interviews were conducted with Muslims (10 women and 16 men) of Middle Eastern, Pakistani, or Indian origin. The participants resided in the province of New Brunswick, Canada, between 2002 and 2003. Data collection and analysis were conducted simultaneously. Steps of utilizing, categorizing, and pattern seeking were used to dissect the interviews until saturation was obtained. Many participants reported that after 9/11, their Islamic faith and experiences of being Muslim suddenly became significant to society at large. The research findings revealed that these participants talked about a sudden transition from cultural safety to cultural risk after 9/11. Their positive experiences of cultural safety included invisibility as a minority and a sense of social integration in the community. Cultural risk was found to stem from intensive international media attention that highlighted their precarious minority status.

Research Highlight boxes provide abstracts of current nursing research studies and explain the implications for your daily practice.

Nursing Care Plans feature a format that helps you understand the process of assessment, the relationship between assessment findings and nursing diagnoses, the identification of goals and outcomes, the selection of interventions, and the process for evaluating care.

BOX 13-4 NURSING CARE PLAN

Acute Pain

Assessment

Ms. Devine is a 52-year-old woman who was injured in a fall two months ago that caused rupture of a lumbar disc. She is scheduled for a lumbar laminectomy this afternoon. Ms. Devine is the office manager for a realty business she runs with her husband. She was

not able to work regularly over the first month after the injury. She has sciatic pain that is sharp and burning, radiating down from her right hip to her right foot. The pain worsens when she sits. Her vital signs are as follows: temperature 37.3°C; blood pressure, 138/82 mm Hg; pulse, 84 beats per minute; and respirations, 24 breaths per minute.

Assessment Activities

Observe client's body movements.

Findings and Defining Characteristics*

Client limps slightly with right leg. Turns in bed slowly.

Observe client's facial expression.

Client grimaces when she attempts to sit down.

Ask client to rate pain at its worst.

Client rates pain on a scale of 0 to 10 at an 8 or 9 at its worst.

*Defining characteristics are in italic type.

Nursing Diagnosis: Acute pain related to pressure on spinal nerves

Planning

Goal (Nursing Outcomes Classification)¹

Pain Control

Client will achieve improved pain control before surgery.

Expected Outcomes

Knowledge of Treatment

Client's self-report of pain will

Client's facial expressions reveal

¹Outcomes classification labels from Moorhead, S., Johnson, M., Maas, M., & Swanson, E. (Eds.). (4th ed.) St. Louis, MO: Mosby.

Interventions (Nursing Interventions Classification)¹

Analgesic Administration

Set positive expectations regarding effectiveness of analgesics.

Rationale

Optimizes client's response to medication (Bulechek et al., 2008).

Give analgesic 30 minutes before turning or positioning client and before pain increases in severity.

Medication will exert peak effect when client increase movement.

Pain Management

Reduce environmental factors in client's room (e.g., noise, lighting, temperature extremes).

Pleasurable sensory stimuli reduce pain perception.

Offer client information about any procedures and efforts at reducing discomfort.

Information satisfies client's interests and enables client to evaluate and communicate pain (McCaffery & Pasero, 1999).

Progressive Muscle Relaxation

Direct client through progressive muscle relaxation exercise. Coach client through exercise.

Relaxation techniques enable self-control when pain develops, reversing the cognitive and affective-motivational component of pain perception.

¹Intervention classification labels from Bulechek, G. M., Butcher, H. K., & Dochterman, J. M. (2008). *Nursing interventions classification (NIC)* (5th ed.). St. Louis, MO: Mosby.

Evaluation

Nursing Actions

Ask client to report severity of pain 30 minutes after analgesic administration.

Client Response and Finding

Ms. Devine reports pain at a level 5 on a scale of 0 to 10.

Achievement of Outcome

Pain is reduced, necessitates further nonpharmacological intervention to achieve outcome.

Observe client's facial expressions.

Ms. Devine is observed to have a relaxed facial expression.

Client's level of comfort is improving.

Evaluation explains how to evaluate and determine whether the outcomes have been achieved.

Rationales for each of the interventions in the care plans help you to understand why a specific step or set of steps is performed.

2008). Extra weight, particularly in obese and moderately obese individuals, is believed to increase intrapelvic pressure; in one study, women who lost an average of 15 kg experienced a 51% reduction in incontinent episodes (Hunnskaar, 2008).

Caffeine contributes to urinary incontinence as it has a diuretic action and irritant effect (Cassel & Skelly, 2006). You can play an important role in educating, counselling, and supporting the patient to enable lifestyle modification that reduces the risk factors for incontinence.

Pelvic Floor Muscle Exercises. The pelvic floor musculature (PFM) spans the opening in the bony pelvis and combines with connective tissue to provide structural support for the pelvic organs. A well-toned PFM maintains the bladder neck in position to ensure that any increase in intra-abdominal pressure, as occurs with coughing, is transmitted not only to the bladder but also to the bladder neck to maintain closure. Contraction of the PFM results in urethral compression as the urethra is pulled forward toward the symphysis pubis (Ashton-Miller & Delancey, 2007). Weakened PFMs can result from muscle wasting caused by prolonged immobility, frequent straining in association with urinary or fecal elimination, stretching of muscles during childbirth, menopausal muscle atrophy, or traumatic damage.

Pelvic floor muscle exercises (PFMEs), also known as **Kegel exercises**, improve the strength of PFMs through hypertrophy and recruitment of additional muscle fibres associated with repetitive contractions (Ashton-Miller & Delancey, 2007). These exercises have demonstrated effectiveness in treating stress incontinence, overactive bladders, and mixed causes of urinary incontinence (Dolman, 2007). Patients begin these exercises during voiding to learn the technique: if they are able to slow the urinary stream, they are contracting the proper muscles. The exercises are then practised at nonvoiding times (Box 43-13). Patients should be alert and motivated to perform the exercises. They also should be aware that it may take 12 to 16 weeks to notice appreciable change, but that maintaining the exercises is important to obtain a positive outcome.

Bladder Training. The goal of bladder training is to increase gradually the interval between voids and to decrease voiding frequency (Eustice, 2007). The overall purpose is to restore a normal pattern of voiding. For bladder training to be successful, patients must be alert, motivated, and physically able to follow a training program. The program includes education, scheduled voiding, and positive reinforcement.

The first step in bladder training is establishing a baseline. The patient or caregiver completes a urinary diary to assess maximum voiding intervals. It is not uncommon for the patient with frequency or an overactive bladder to void small amounts hourly or more often. An initial training schedule for such a patient might involve a voiding schedule of every 75 minutes while awake, increasing every one to three weeks by 15-minute increments toward a three-hour schedule. The rate of incremental changes will depend on the patient's progress and on his or her ability to adhere to a rigid schedule. Urge-suppression techniques, such as counting backward from 100 when the urge to void is felt and performing pelvic floor muscle contractions, are helpful. You must be aware that the patient who has experienced an episode of incontinence in public will be particularly hesitant to deter voiding for even brief periods.

Habit Retraining and Prompted Voiding. Habit

Evidence-Informed Practice Guideline

boxes provide examples of recent state-of-the-science guidelines for nursing practice.

BOX 43-13 PATIENT TEACHING

Pelvic Floor Muscle Exercises (Kegels)

Objectives

The patient who is cognitively alert and motivated will achieve continence or experience fewer episodes of incontinence as a result of increased pelvic floor muscle tone and strength.

Teaching Strategies

- Explain the method used to identify proper muscle contraction: female patient sits on the toilet with knees apart and tightens muscles to stop the flow of urine; a male patient tries to stop the flow of urine midstream.
- After muscle is identified, instruct the patient to lie down with knees bent and apart, or to sit.
- Instruct the patient to contract the pelvic floor muscle gradually and hold the contraction for 3 to 10 seconds without tensing the muscles of the legs, buttocks, back, or abdomen. Remind the patient to breathe during the exercise.
- Instruct the patient to relax the muscle gradually for an equal time period between each contraction.
- The patient should repeat this exercise at least two or three times, and work up to 10 repetitions as it becomes easier. The patient should do this exercise two or three times a day, or as often as possible.
- Explain that within the first week of exercises, the patient and nurse can assess whether proper muscle contraction is occurring by patient placing two fingers in the vagina (or, for men, one finger in rectum) while contracting the pelvic floor muscle. The patient should feel tightening in the vagina or anus during the contraction.
- Teach the patient and the caregiver to keep a 24- to 72-hour urinary diary to identify changes in patterns of urinary elimination.



BOX 43-14 EVIDENCE-INFORMED PRACTICE GUIDELINE

Prompted Voiding for People With Urinary Incontinence

- Approach the patient at scheduled prompted voiding times.
- Wait five seconds for the patient to initiate a request to toilet.
- Ask the patient if he or she is wet or dry.
- Physically assess the patient to determine continence status.
- Provide positive feedback if the patient is dry.
- Prompt the patient to toilet.
- Offer assistance with toileting.
- Provide feedback.
- Inform the patient of the next scheduled prompted voiding session.
- Encourage the patient to self-initiate requests to toilet.
- Record the result of the prompted voiding session.

Source: Adapted from Wyman, J. (2008). Prompted voiding. In B. Ackley, B. Swan, G. Ludwig, & S. Tucker (Eds.), *Evidence-based nursing care guidelines: Medical-surgical interventions* (pp. 696-698). St Louis, MO: Mosby.

self-catheterization. In general, the goal is to have patients perform self-catheterization every six to eight hours, but the schedule should be individualized.

Evaluation

Patient Care

The patient is the best source of evaluation of outcomes and responses to nursing care (Figure 43-18). However, you will also evaluate the effectiveness of nursing interventions through comparisons with baseline data. You should evaluate for changes in the patient's voiding pattern, the presence of urinary tract alteration, and the patient's physical condition. Actual outcomes are compared with expected outcomes to determine the patient's health status. Continuous evaluation allows you to determine whether new or revised therapies are required or if any new nursing diagnoses have developed.

Patient Expectations

If you have developed a trust relationship with the patient, indications of the patient's degree of satisfaction with his or her care will be evident. The patient may smile or nod in appreciation. However, you need to confirm whether the patient's expectations have been met to full satisfaction. You may need to ask specifically about the patient's degree of urinary control and comfort. If simply asked, "How are you feeling today?" the patient may reply with a noncommittal "Okay." However, you need specific information about how well an intervention has met the patient's need in order to continue or to revise the care plan. You can also assist the patient in redefining unrealistic expectations when impairment in function is not likely to be altered as completely as he or she might like.

KEY CONCEPTS

- The act of micturition, or voiding, is influenced by voluntary control from higher brain centres and involuntary control from the spinal cord.

Patient (Client) Teaching boxes highlight what and how to teach patients and how to evaluate learning.

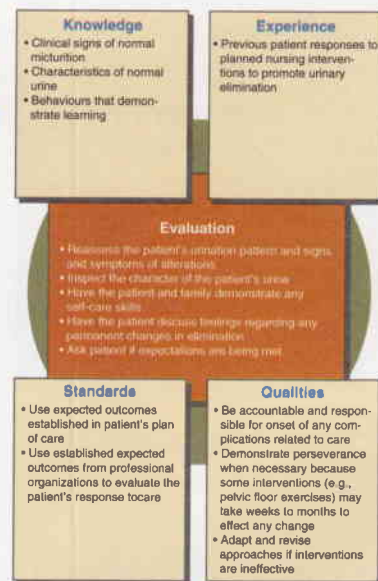


Figure 43-18 Critical thinking model for urinary elimination evaluation.

- Symptoms common to urinary disturbances include urgency, frequency, dysuria, polyuria, oliguria, and difficulty in starting the urinary stream.
- When collected properly, a clean-voided urine specimen does not contain bacteria from the urethral meatus.
- Methods of promoting the micturition reflex assist patients in sensing the urge to urinate and in controlling urethral sphincter relaxation.
- An increased fluid intake results in increased diluted urine formation that reduces the risk of urinary tract infections.
- An in-dwelling urinary catheter remains in the bladder for an extended period, making the risk of infection greater than with intermittent catheterization.
- Catheter irrigation is necessary when the catheter becomes occluded with sediment or blood clots.
- A catheter drainage system should be a closed system positioned to allow free drainage of urine by gravity.
- Incontinence is classified as transient, urge, stress, mixed, functional, overflow, reflex, or total. Each type has specific nursing interventions.
- Specific guidelines for catheter selection should be followed so that the catheter does not cause harm.

assessment should result in the formulation of nursing diagnoses appropriate for alterations in urinary elimination. You should be alert to individual needs related to normal aging that predispose older adults to certain elimination problems (Box 43-2).

* BOX 43-2 FOCUS ON OLDER ADULTS

- Physiological changes in the lower urinary tract occur in continent as well as incontinent older adults.
- Dilute urine discourages bacterial growth; therefore, older adults should be encouraged to increase their fluid intake to at least six glasses a day, unless medically contraindicated (Dubeau et al., 2009).
- Fluids that promote an acidic urine (e.g., cranberry juice) should be made available as part of the patient's fluid intake because an acidic urine also helps to inhibit bacterial growth and may prevent UTIs (Nguyen, 2008).
- Restriction of fluids two hours before sleep, combined with elevating the legs to allow for venous return and bladder emptying before bedtime (leg elevation for at least one hour) may decrease the incidence of nocturia (Dubeau et al., 2009).
- In-dwelling catheters should not be used routinely in older adults unless other options have been tried. The risk of infection increases dramatically for catheterized patients (Duthani-Mehta, 2007).
- Treating asymptomatic bacteriuria in older adults is not recommended.
- Incontinence is not a normal part of aging, and efforts should be made to assess incontinence and provide interventions to promote return to continence.



Health History

The nursing health history includes a review of the patient's urinary elimination patterns and symptoms of urinary alterations and an assessment of factors that may affect the ability to urinate normally.

Pattern of Urination. Ask the patient about usual daily voiding patterns and any recent changes. Information about voiding symptoms such as hesitancy (Table 43-1) and the overall pattern of urination, including average time between voids and episodes of urgency and incontinence, is important to a nursing assessment and establishes a baseline for comparison.

A **urinary diary** is an important diagnostic tool (Figure 43-7), particularly because many adults are not aware of how often they void throughout the day. A diary is kept by the patient or the caregiver; it records approximate times of urination, times of leakage and estimates of the amount lost (dribbled, wet pad, wet clothing), and types and amount of fluids ingested. Measuring two or more voids (not including the first void of the morning) will provide useful information about the volume of urine that a patient generally stores. Recording factors that precipitated urination or leakage, such as a strong urge or a cough, is particularly helpful. The number of pad changes per day is also useful information. A three-day (72-hour) voiding diary helps in evaluating lifestyle habits (e.g., fluid intake) in relation to the voiding pattern and symptoms (Ermer-Selton, 2006).

Factors Affecting Urination. It is important to summarize the factors associated with the patient's medical history, surgical history, and current environment that may affect urination. Medical history includes disease conditions that can affect elimination, such as multiple sclerosis, spinal cord injury, stroke, and diabetes. Another factor to consider is the patient's

► TABLE 43-1 Common Symptoms of Urinary Alterations

Symptom	Description	Common Cause
Incontinence	Involuntary loss of urine	Multifactorial
Urgency	Sudden and compelling urge to void that cannot be postponed	Overactive bladder
Dysuria	Painful or difficult urination	Bladder infection
Frequency	Voiding more than eight times in 24 hours	Increased bladder activity
Hesitancy	Difficulty initiating urination	Hypotension
Polyuria	Voiding large amounts of urine	Excessive fluid intake
Oliguria	Diminished urinary output relative to intake (usually 400 mL/24 hours)	Dehydration
Nocturia	Getting up at night to void	Excessive fluid intake
Dribbling	Leakage of urine despite voluntary control of urination	Stress incontinence
Hematuria	Blood in the urine	Nephritis
Retention	Accumulation of urine in the bladder, with inability of bladder to empty fully	Urethral obstruction
Elevated postvoid residual urine	Elevated volume of urine remaining after voiding (>100 mL)	Neurogenic bladder

1078 Unit VIII Basic Physiological Needs

parental knowledge of health, both of which relate to income status (Riediger et al., 2007). At the same time, lower socioeconomic status is associated with physical inactivity in Canadian adolescents (Janseen et al., 2006).

Approximately 3.7 million (15%) Canadians rely on food banks that are unable to supply recommended amounts of fresh fruits, vegetables, dairy products, and meats and alternatives (Irwin et al., 2007). The problem is worsened when children cannot access nutritional programs at schools (Henry et al., 2003). In Atlantic Canada, low-income lone mothers and their older children have poor diet quality (Glanville & McIntyre, 2006).

Although mandatory fortification of staple foods with micronutrients has helped to reduce income-related disparities (Ricciotti & Tarasuk, 2006), other interventions are also needed to counter the threat to good nutrition and health from lack of purchasing power at individual and collective levels. For those on limited budgets, food preparation can be modified for substances that need to be used sparingly; for example, bean or cheese dishes can often replace meat. Menu planning a week in advance helps patients comply with a specific diet, eat nutritiously, and stay within their budget. A nurse or dietitian may check menus for content. Often, simple tips can help, such as baking rather than frying to reduce fat intake, using lemon juice or spices to add flavour to low-sodium diets, and

Focus on Older Adults boxes prepare you to address the special needs of older adults.

avoiding grocery shopping when hungry because it can lead to spontaneous purchases of foods not included in meal plans. Strategies to help financially disadvantaged groups improve their nutrition include collective kitchens and gardens (Engler-Stringer & Berenbaum, 2005), coalitions with community-based organizations, antipoverty advocacy, and political commitment to policies of full employment (Power, 2005). Also important are public-awareness forums (Chapman, 2006) and a rights-based approach to food security at federal and provincial levels (Rideout et al., 2007) with support to families that have inadequate resources to meet their daily nutritional needs (Kurtz Landy, 2007). See Box 42-8 for an example of an innovative program that aims to increase food security for individuals, families, and communities.

safety alert Food safety is also an important public health issue. Food-borne illnesses can occur from poor hygiene practices and improper food storage or preparation. Nurses should educate patients about reducing the risks of food-borne illnesses (Table 42-7 and Box 42-9).

Acute Care

Many factors influence nutritional intake in acute care settings. Ill or debilitated patients often have loss of appetite (**anorexia**). The ketosis that accompanies starvation can further suppress

Focus on Primary Health Care boxes draw attention to principles of primary health care and their application.

* BOX 42-8 FOCUS ON PRIMARY HEALTH CARE

Case Study

Foodshare (Toronto) is a nonprofit community organization that promotes "good healthy food for all" while reducing costs to the health care system. Since 1985, Foodshare has worked with communities to improve nonstigmatizing access to affordable, nutritious, sustainably produced food through innovative programs, food markets, and policy recommendations. Food security is facilitated through the creation and distribution of resources, training workshops, networks, and coalitions. Food issues are addressed from the growing and processing of food to its distribution, purchasing, cooking, and consumption. The Foodshare programs try to rebuild food skills that are quickly being lost in Canadian society as people abandon the family meal tradition and turn increasingly to fast foods and eating on the run. Foodshare partners (e.g., the Government of Ontario, Public Health Services, community clinics and shelters, school boards, and the Volunteer Action Online program), professionals, teachers, parents, and volunteers work together to promote a locally sourced, grow-your-own-food lifestyle in various ways:

- **FoodLink Hotline:** Telephone referral 416-392-6655 available Monday to Friday 10 A.M. to 4 P.M. for those seeking information on food programs.
- **Community gardening programs:** Information, training (e.g., composting workshops), and resources provided to individuals and groups in preparing gardens and harvesting the produce.
- **Incubator Kitchen:** A fully equipped kitchen that provides groups without access to a commercial kitchen the opportunity to come together to plan and prepare low-cost nutritious meals in bulk.
- **The Good Food Box:** This food distribution system provides fresh fruit and vegetables at wholesale prices to over 200 community drop-off sites across the City of Toronto reaching 12,000 people. Individuals and families who are part of neighbourhood-based groups pay for and order food in advance. The program workers purchase foods in bulk to support local farmers; volunteers and

staff pack and deliver the food boxes to the drop-off sites. All boxes are accompanied by a newsletter offering nutrition information and economical food preparation tips. The "Reach for 5" basket, geared to seniors, contains prepared, cut-up fruit and vegetables.

- **Power Soups and Power Meals:** Foodshare makes dense soups, meals, and nutrition/training workshops available at a heavily subsidized price to Toronto shelters and drop-ins serving the homeless, which enables the underprivileged to have access to a wholesome meal.
- **Baby Nutrition:** Food-related activities for families with infants and preschoolers include workshops on making homemade baby food from fresh affordable food and cooking with kids.
- **Partners for Student Nutrition:** Foodshare works with Toronto Public Health and other community agencies to sponsor 300 student nutrition programs in Toronto.
- **Focus on Food:** A training program for marginalized youth focusing on community service and developing cooking, gardening, and nutrition skills.
- **Field to Table Wholesale Produce:** A community development project that makes fresh fruit and vegetables available and affordable to schools (e.g., the "Salad Bar" project) in order to promote increased consumption of fresh, nutritious foods among children.
- **Partnership with Canadian Mental Health Association:** Individuals living with mental health challenges earn minimum wage and gain valuable job skills producing sprouts and seedlings for sale.
- **Online food security resource centre:** An interactive library of electronic and print newsletters, food program manuals, community resource sites such as sustainable agriculture and anti-poverty issues with links to key Web sites, listservs, e-bulletins, and archived, current, and upcoming workshops.



SKILL 45-1 Moving and Positioning Patients in Bed

Delegation Considerations

The skills of moving and positioning patients in bed can be delegated to unregulated care providers (UCPs). The nurse is responsible for assessing the patient's level of comfort and for any potential hazards. It is important to instruct the UCP on any limitations affecting movement and positioning of the patient in bed.

Procedure

STEPS

1. Assess patient's body alignment and comfort level while patient is lying down.
2. Assess for risk factors that may contribute to complications of immobility:
 - A. Paralysis: Hemiparesis resulting from cerebrovascular accident; decreased sensation
 - B. Impaired mobility: Traction or arthritis or other contributing disease processes
 - C. Impaired circulation
 - D. Age: Very young, older adults
 - E. Level of consciousness and mental status
 - F. Assess condition of patient's skin.
3. Assess patient's physical ability to help with moving and positioning:
 - A. Age
 - B. Level of consciousness and mental status
 - C. Disease process
 - D. Strength, coordination
 - E. ROM
4. Assess physician's orders. Clarify whether any positions are contraindicated because of the patient's condition (e.g., spinal cord injury, respiratory difficulties, certain neurological condition, presence of incisions, drain, or tubing).
5. Perform hand hygiene.
6. Assess for the presence of tubes, incisions, and equipment (e.g., traction).
7. Assess the ability and motivation of the patient, family members, and primary caregiver to participate in moving and positioning the patient in bed in anticipation of discharge to home.
8. Raise level of bed to a comfortable working height, and get extra help if needed.
9. Perform hand hygiene.
10. Explain procedure to patient.
11. Position patient flat in bed if this is tolerated.

Critical Decision Point: Before flattening the bed, account for all tubes in the mattress or bed frame as bed is lowered.

Equipment

- Pillows
- Drawsheet or friction-reducing device
- Positioning devices as required (e.g., trochanter roll, extra pillows, hand rolls)

RATIONALE

- Provides baseline data for later comparisons. Determines ways to improve position and alignment.
- Increased risk factors require patient to be repositioned more frequently.
- Paralysis impairs movement and causes muscle-tone changes; sensation can be affected. Because of difficulty in moving and poor awareness of the involved body part, the patient is unable to protect and position the affected body part.
- Traction or arthritic changes of affected extremity result in decreased range of motion (ROM).
- Decreased circulation predisposes the patient to pressure sores.
- Premature and young infants require frequent turning because their skin is fragile. Normal physiological changes associated with aging predispose older adults to greater risks for developing complications of immobility.
- Patients who are comatose or semicomatose are unable to convey areas of skin pressure, increasing the risk for skin breakdown.
- Provides a baseline to determine effects of positioning.
- Enables nurse to use patient's mobility and strength. Determines need for additional help. Ensures patient's and nurse's safety.
- Older adult patients may move more slowly and with less strength.
- Determines need for special aids or devices.
- Patients with altered levels of consciousness may not understand

Nursing Skills are presented in a clear, two-column format that includes Steps and Rationales to help you learn how and why a skill is performed.

Video icons indicate video clips associated with specific skills that are available on the free *Evolve Student Learning Resources*.

Delegation Considerations guide you in delegating tasks to assistive personnel.

Critical Decision Points alert you to critical steps within a skill to ensure safe and effective client care.

Clear, close-up **photos and illustrations** show you how to perform important nursing techniques.

Recording and Reporting sections provide guidelines for what to chart and report with each skill.

Home Care Considerations explain how to adapt skills for the home setting.

SKILL 45-1 Moving and Positioning Patients in Bed—cont'd

- (3) Position two nurses on side of bed to which the patient will be turned. Position third nurse on the other side of bed (see Step 12K[3] illustration).
- (4) Fanfold or roll the drawsheet or pull sheet.
- (5) Move the patient as one unit in a smooth, continuous motion on the count of 3 (see Step 12K[5] illustration).



Step 12K(3) Position nurses on each side of patient.

- (6) The nurse on the opposite side of the bed places pillows along the length of the patient (see Step 12K[6] illustration).
- (7) Gently lean the patient as a unit back toward the pillows for support (see Step 12K[7] illustration).



Step 12K(6) Place pillows along patient's back for support.

13. Perform hand hygiene.
14. Evaluate patient's level of comfort and ability to assist in position change.
15. After each position change, evaluate patient's body alignment and presence of any pressure areas. Observe for areas of erythema or breakdown involving skin.

Unexpected Outcomes

Joint contractures

Skin erythema and breakdown

Patient avoids moving

Recording and Reporting

- Record procedure and observations (e.g., condition of skin, joint movement, patient's ability to assist with positioning).
- Report observations at change of shift and document in nurses' notes.

Home Care Considerations

- Teach the family about the importance of body mechanics for themselves and the patient.
- Teach the patient and family about the signs of skin breakdown and the importance of safety during positioning patients with decreased sensation or mobility.

- Distributes weight equally among nurses.

- Provides strong handles to grip the drawsheet or pull sheet without slipping.
- Maintains proper alignment by moving all body parts at the same time, preventing tension or twisting of the spinal column.

Step 12K(5) Move patient as a unit, maintaining proper alignment.

- Pillows keep the patient aligned.

- Ensures continued straight alignment of spinal column, preventing injury.

Step 12K(7) Gently lean patient as a unit against pillows.

- Reduces transmission of microorganisms.
- Patients with reduced activity tolerance and increased levels of pain may find position changes very tiring and will need post-position change interventions to restore their level of comfort.
- Prompt identification of poor alignment reduces risks to the patient's skin and musculoskeletal systems.

Related Interventions

- Improper positioning results in shortening of muscles.
- Frequency of repositioning is inadequate.
- Place turning schedule above patient's bed.
- Frequency of repositioning is inadequate.
- Place turning schedule above patient's bed.

benefits for patients with acute respiratory distress syndrome and acute lung injury (Marklew, 2006).

Assess for and correct any of the following potential trouble points for patients in the prone position (see Skill 45-1 for preventive measures):

- Neck hyperextension
- Hyperextension of the lumbar spine
- Plantar flexion of the ankles
- Unprotected pressure points at the chin, elbows, hips, knees, and toes

Side-Lying Position. In the side-lying (or lateral) position, the patient is resting on the side with the major portion of body weight on the dependent hip and shoulder. A 30-degree lateral position is recommended for patients at risk for pressure ulcers (see Chapter 46). Trunk alignment should be the same as in standing. For example, the structural curves of the spine should be maintained, the head should be supported in line with the midline of the trunk, and rotation of the spine should be avoided. The following trouble points are common in the side-lying position (see Skill 45-1 for preventive measures):

- Lateral flexion of the neck
- Spinal curves out of normal alignment
- Shoulder and hip joints internally rotated, adducted, or unsupported
- Lack of support for the feet
- Lack of protection for pressure points at the ear, shoulder, anterior iliac spine, trochanter, and ankles
- Excessive lateral flexion of the spine if the patient has large hips and a pillow is not placed superior to the hips at the waist

Sims' Position. Sims' position differs from the lateral position in the distribution of the patient's weight. In Sims' position, the weight is placed on the anterior ilium, humerus, and clavicle. Trouble points common in Sims' position include the following (see Skill 45-1 for preventive measures):

- Lateral flexion of the neck
- Internal rotation, adduction, or lack of support to the shoulders and hips
- Lack of support for the feet
- Lack of protection for pressure points at the ilium, humerus, clavicle, knees, and ankles

Transfer Techniques. Nurses often provide care for patients who must be assisted to change positions, who must be moved up in bed, or who must be transferred from a bed to a chair or from a bed to a stretcher. Use of proper body mechanics will enable you to position, move, or transfer patients safely and also protect you from injury to the musculoskeletal system (see Chapter 35). Although many transfer techniques are used, the following general guidelines should be followed in any transfer procedure:

- Raise the side rail on the side of the bed opposite you to prevent the patient from falling out of bed.
- Elevate the level of the bed to a comfortable working height.
- Assess the patient's mobility and strength to determine what assistance the patient can offer during transfer.
- Determine the need for assistance from other care providers or mechanical lifts.
- Explain the procedure to the patient and describe what is expected of the patient.
- Assess for correct body alignment and pressure areas after each transfer.

safety alert Recognition of your own personal strengths and limits is crucial. Moving a patient who is completely immobilized alone is dangerous and not allowed in many agencies. If you are attempting transfer or moving techniques for the first time, you should request help to reduce the risk of injury to yourself and to the patient.

Moving Patients. Patients require various levels of assistance to move up in bed, move to the side-lying position, or sit up at the side of the bed. For example, a young, healthy woman may need only a little support as she sits at the side of the bed for the first time after childbirth, whereas an older person may need help from one or more nurses to do the same task one day after abdominal surgery.

Always enlist the patient's help to the fullest extent possible. To determine what the patient is able to do alone and how many people are needed to help move the patient in bed, you need to assess the patient to determine whether the illness contradicts exertion (e.g., cardiovascular disease).

Next, determine whether the patient comprehends what is expected. For example, a patient recently medicated for postoperative pain may be too lethargic to understand instruction. To ensure safety, two nurses would be needed to move the patient in bed. You must then determine the comfort level of the patient and evaluate personal strength and knowledge of the procedure.

Finally, determine whether the patient is too heavy or immobile for you to complete the procedure alone (see Skill 45-1). If in doubt, always request assistance from another person. Collaborate with the physiotherapist, occupational therapist, and physician to plan for mobilizing the bariatric patient (Box 45-9). Use of mechanical transfer devices may be warranted (Figure 45-18), and agency lifting and transferring policies must be followed (Worksafe BC, 2006).

Assessment criteria and tools have been developed to help you gather data and to assess and plan for the safe transfer of patients. An example of a patient mobility assessment form is shown in Table 45-4.

Transferring a Patient from a Bed to a Chair. Transfer of a patient from a bed to a chair by one nurse requires assistance from the patient and should not be attempted with a patient who cannot help (Skill 45-2). Explain the procedure to the patient before the transfer. Moving obstacles out of the way also prepares the environment. The chair is placed next to the bed with the chair back in the same plane as the head of the bed. Placement of the chair allows you to pivot with the patient and to transfer the patient's weight in a controlled manner.

A safe transfer is the first priority. If you are doubtful about personal strength or the patient's ability to help, you should request assistance. A transfer belt should be used with all patients being transferred for the first time and thereafter as deemed necessary. Use of a transfer belt (called a gait belt when used for walking with a patient) helps prevent caregiver back injuries and aids in the safe transfer of the patient. The belt encircles the patient's waist and has handles attached for the nurse to hold. It is applied over the patient's clothing, never over bare skin. The belt is tightened so that it is snug but does not cause discomfort or impair breathing, and the buckle is placed off-centre in the front or in the back. The buckle should not be over the spine.

The patient should sit and dangle the feet at the side of the bed for a minute before standing. The patient should then stand at the side of the bed for another minute so that he or

over the past several decades, many nurses became dissatisfied with a purely medical approach to care, partly because people realized that scientific research could not answer all the existential questions raised by patients (McSherry, 2001). Nurses felt a spiritual gap in the profession and began to find ways to articulate and incorporate spirituality into practice and research. Spirituality was conceptualized as broader than any particular religion or culture. Between 1980 and 2000, renewed interest in spirituality was reflected by an increase in nursing literature on spirituality, as well as a growing interest in parish nursing as a way for faith communities in Canada to reclaim their healing mission (Miller, 2004; Olson et al., 1998).

Canadian nursing scholarship has made important contributions by emphasizing the relationship between spirituality, religion, health, and culture (Kulig et al., 2004; Labun & Emblen, 2007; Pesut et al., 2008). For example, in their study of spirituality and health in Punjabi Sikh living in British Columbia, Labun and Emblen (2007) stated that an understanding of the interplay of spirituality, religion, and health informs culturally competent care. Just as Canadian nurses must understand cultural influences in health and illness, they must also recognize the need for sensitive, safe, and ethical nursing care in which patients' spiritual needs and resources are recognized and supported (Box 27-1). Because Canada is a pluralistic society in which diversity is valued, Canadian nurses must recognize how diverse views influence the way patients (and nurses) view spirituality (Pesut, 2006; 2009).

Spirituality and Health: Empirical Evidence

Spiritual health has been defined as "a connectedness with self, others, and the sacred that transcends and empowers the self" (Como, 2007, p. 226). Spiritual needs may increase as health declines (Bruce et al., 2011; Carson & Koenig, 2008; McSherry, 2006). There is increasing evidence that spirituality

Safety Alerts indicate techniques you can use to ensure patient and nurse safety.

Cultural Aspects of Care boxes prepare you to care for patients of diverse populations and suggest actions needed to meet different cultural needs and preferences.

BOX 27-1 CULTURAL ASPECTS OF CARE

In caring for patients from different cultures, it is important that you take into account their cultural understandings of spirituality and religion. You must determine what is important in their lives and what provides them with inner strength and meaning. Patients are often attempting to find meaning in the changing circumstances of their health and illness but that meaning will differ depending on their values and beliefs. For example, Shih et al. (2009) explored the spiritual needs of older Taiwanese patients with terminal cancer using participant observation and in-depth interviews. They suggested that caring for the body and transcending worldly being were common patterns and emphasized, among other things, the important role of the funeral ceremony in purifying the soul and contributing positively to the afterlife. Similarly, Mok, Wong, and Wong (2010) explored through interviews the meaning of spirituality and spiritual care among Hong Kong Chinese terminally ill. An important finding from this study was that all participants had difficulty understanding and expressing spirituality. Further, they did not expect spiritual care from nurses but desired quality interpersonal care. Reimer-Kirkham (2009) explored the negotiation of religious and spiritual plurality in health care encounters and used the example of Sikh patients to highlight how lived religion is a moral code that informs all of life and has important implications for ethical nursing care.

Implications for Practice

- Explore the spirituality of patients within the contexts and meanings of their own cultures. Spirituality may not be the language that is most familiar to them. It is always appropriate to explore the meaning of health and how patients achieve balance, stability, peace, or comfort in their lives.
- Offer a universal and holistic approach to patients by demonstrating caring and by using therapeutic communication techniques.
- Promote an environment during assessment in which human rights, values, customs, and spiritual beliefs are respected.
- Include appropriate spiritual or religious care providers.
- Avoid the use of language that alienates patients or discriminates between different religions (e.g., asking whether the patient wants someone from his or her "faith community" to visit, rather than "temple," "church," or "synagogue").
- Understand that different cultures and religions have ethical codes that are an important part of ethical nursing care.

References: Mok, E., Wong, F., & Wong, D. (2010). The meaning of spirituality and spiritual care among the Hong Kong Chinese terminally ill. *Journal of Advanced Nursing*, 66(2), 360-370. Reimer-Kirkham, S. (2009). Sikhism as lived religion: Implications for healthcare ethics. *Nursing Ethics*, 16(4), 410-421. Shih, F., Lin, H., Gau, M., Chen, C., Hsiao, S., Shih, S., & Sheu, S. (2009). Spiritual needs of Taiwan's older patients with terminal cancer. *Oncology Nursing Forum*, 36(1), E31-38.

has the potential to mobilize personal capacities, illness-coping strategies, and positive health behaviours (Como, 2007; Krok, 2008; Lawler-Row & Elliott, 2009; Levin, 2010; Vespa et al., 2011; Whelan-Gales et al., 2009). For example, research involving 263 patients with cancer found that those who reported healthy inner spirituality, spiritual coping, and spiritual well-being were less likely to experience depression and intrapersonal/interpersonal conflicts (Vespa et al., 2011). Positive spiritual and religious coping has also been linked to a

factors during an admission nursing assessment. Many interventions reduce the risk of thrombus formation in the patients who are immobilized. Leg exercises, encouragement of fluids, position changes, and teaching of such preventive measures should begin when the patient becomes immobile. Preoperative patients should be given this information before surgery (see Chapter 48). Other interventions such as intermittent pneumatic compression (IPC) and sequential compression devices (SCDs) require a physician's order. Maintenance and administration of prophylaxis is a nursing role, and nurses can determine when the patient is fully mobile postoperatively, decreasing the continued risk for DVT.

Medications also require a physician's order. Subcutaneous heparin and low-molecular-weight heparin (LMWH), such as tinzaparin, enoxaparin, and dalteparin, are the most widely used drugs in the prophylaxis of DVT. The recent approval of rivaroxaban and dabigatran, in addition to the long-standing availability of warfarin, means more oral options for DVT prophylaxis and anticoagulation therapy. Heparin is considered the gold standard for treatment because it has been well studied and validated. Common dosage for heparin therapy is 5000 units given subcutaneously every 12 hours until the patient is fully mobile or discharged (Geerts et al., 2008). Anticoagulants suppress clot formation and thus you must continually assess the patient for signs of bleeding, such as increased bruising, guaiac-positive stools, and bleeding gums. Although most patients receiving prophylactic doses of anticoagulants do not experience side effects, the risk of bleeding is present.

SCDs and IPCs consist of sleeves or stockings made of fabric or plastic that are wrapped around the leg and secured with Velcro (Box 45-7). The sleeves are then connected to a pump that alternately inflates and deflates the stocking around the leg. A typical cycle is inflation for 10 to 15 seconds and deflation for 45 to 60 seconds. Inflation pressures average 40 mm Hg. Use of SCDs or IPCs on the legs decreases venous stasis by increasing venous return through the deep veins of the legs. For optimal results, use of SCDs or IPCs is begun as soon as possible and maintained until the patient becomes fully ambulatory. Graduated compression stockings can help prevent DVT, but patients must receive the right size, and the SCD or IPC must be used correctly.

Elastic stockings (sometimes called *thromboembolic device (TED) hose* or thigh-high antiembolic stockings) also aid in maintaining external pressure on the muscles of the lower extremities and thus may promote venous return (Box 45-8). When considering applying elastic stockings, first assess the patient's suitability for wearing them. The stockings should not be applied if any local condition affects the leg (e.g., any skin lesion, gangrenous condition, or recent vein ligation) because application may compromise circulation. You will need to measure the patient's legs with a tape measure to determine proper stocking size. The stockings must be applied properly, and they must be removed and reapplied at least once per shift. Assess circulation at the toes to ensure that the hose are not too tight. In addition, the stockings should always be clean and dry; it may be useful for the patient to have two pairs.

Positioning techniques aid in reducing compression of the leg veins. Proper positioning used with other therapies (e.g., heparin or elastic stockings) aids in reducing the patient's risk of thrombus formation. When positioning patients, use caution to prevent pressure on the posterior knee and deep veins in the lower extremities. Patient teaching should include avoiding

Nursing Story boxes tell a real-life story concerning one or more topics in the chapter.

BOX 45-7 Procedural Guideline

Application of Sequential Compression Stockings

Delegation Considerations:

The skill of applying sequential compression stockings (SCSs) can be delegated to unregulated care providers (UCPs). The nurse is responsible for assessing circulation in the extremities; therefore, when application of the SCSs is delegated, it is important to instruct the UCP to do the following:

- Notify the nurse if the patient complains of pain in the leg
- Notify the nurse if discoloration develops in the extremities

Equipment:

Tape measure, sequential compression stockings, stockinette, hygiene supplies

Procedure:

1. Assess the patient for the need for sequential compression stockings.
 2. Obtain baseline assessment data about the status of circulation, pulse, and skin integrity on the patient's lower extremities before initiating application of sequential compression stockings.
 3. Measure the patient for proper-size stocking by measuring around the largest part of the patient's thigh. Review the manufacturer's directions regarding measuring for proper fit.
 4. Perform hand hygiene. Provide hygiene to lower extremities if needed.
 5. Place a protective stockinette over the patient's leg.
 6. Wrap the stocking around the leg, starting at the ankle, with the opening over the patella (see Step 6 illustration).
- A. Attach the stockings to the insufflator and verify that the intermittent pressure is between 35 and 45 mm Hg.



Procedural Guidelines provide streamlined, step-by-step instructions for performing basic skills.

Chapter 45 Mobility and Immobility 1199

BOX 45-1 NURSING STORY

Patient Rehabilitation

When Grace Lo was admitted to the inpatient rehabilitation unit, it was difficult for me to imagine her living independently in a condominium, driving her car, going out to lunch, shopping, or playing bridge with her friends. She looked so frail and tired, and she needed assistance with everything. Grace was a 66-year-old widow with a diagnosis of uterine cancer. After being diagnosed, Grace was started on chemotherapy to help shrink the size of the tumour before having surgery to remove it. She experienced side effects from the chemotherapy—anaemia and neutropenia. Unfortunately, she also developed recurrent pneumonia and had been immobilized in the intensive care and oncology units for over five weeks.

When Grace was admitted to the rehabilitation unit, she was significantly deconditioned. She had never enjoyed exercising and was feeling regret about not maintaining her physical fitness before her cancer diagnosis. Her ability to complete her chemotherapy treatments depended on her regaining her strength, endurance, mobility, and independence for her ADLs. Grace was very motivated to work with the rehabilitation team, but she was also afraid. What if she couldn't get strong enough to finish her chemotherapy?

At the beginning of rehabilitation, Grace needed assistance from two people for all her transfers. She had a Foley catheter in place, and she fatigued quickly with minimal exertion. Her respiratory status had been compromised by recurrent pneumonia and her past behaviour of cigarette smoking. The first goal was to increase her upper and lower extremity strength for transferring from the bed to a commode at the bedside. It took a coordinated interdisciplinary approach to work on Grace's pace at exercising and her ability to practise ADLs independently. Once Grace was able to safely transfer from the bed with a one-person, minimally assisted standing pivot transfer, the team was able to focus on the goal of urinary continence. Because she had been immobilized for an extended period of time, Grace often felt lightheaded and dizzy when sitting at the bedside before a transfer. These experiences contributed to her feelings of apprehension about falling and to a loss of confidence. It was important to raise the head of Grace's bed in increments before attempting transfers to minimize postural hypotension. After two weeks of exercising and practice, Grace was continent, using the bathroom in her room. However, she still had a long way to go.

Four months after she had been discharged from rehabilitation, I heard my name being called. A fit-looking woman was calling out to me—I barely recognized a radiant Grace. She had continued outpatient rehabilitation and was exercising regularly. Grace excitedly told me that she had finished her last cycle of chemotherapy. Her computerized tomography (CT) scan showed that the tumour in her uterus had decreased in size and she no longer needed surgery. Grace told me that while the diagnosis of cancer scared her, the experiences of being immobilized and dependent on others for all her ADLs had "terrified" her. Her story reminded me of the impact of immobility on all aspects of a person's life and of the importance of setting small, attainable goals in promoting independence and hope.

may result from a fecal impaction (accumulation of hardened feces). This finding is not normal diarrhea, but rather liquid stool passing around the area of impaction (see Chapter 44). Left untreated, fecal impaction can result in a mechanical bowel obstruction that may partially or completely occlude the intestinal lumen, blocking normal propulsion of liquid and gas. The resulting fluid in the intestine produces distension and increases intraluminal pressure. Over time, intestinal

function becomes depressed, dehydration occurs, absorption ceases, and fluid and electrolyte disturbances worsen.

Respiratory Changes. Regular aerobic exercise is known to enhance respiratory functioning. Conversely, lack of movement and exercise places patients at higher risk for respiratory complications. Patients who have recently had surgery or are immobile are at high risk for developing pulmonary complications. The most common respiratory complications are **atelectasis** (collapse of alveoli) and **hypostatic pneumonia** (inflammation of the lung from stasis or pooling of secretions). Both conditions decrease oxygenation, prolong recovery, and add to the patient's discomfort (Black & Hawks, 2009). In atelectasis, secretions block a bronchiole or a bronchus, and the distal lung tissue (alveoli) collapses as the existing air is absorbed, producing hypoventilation. The site of the blockage determines the extent of atelectasis. A lung lobe or even a whole lung may collapse. At some point in the development of these complications, the patient's ability to cough productively declines proportionately. Ultimately, the distribution of mucus in the bronchi increases, particularly when the patient is in the supine, prone, or lateral position. Mucus accumulates in the dependent regions of the airways. Because mucus is an excellent medium for bacterial growth, hypostatic pneumonia may result.

Cardiovascular Changes. The cardiovascular system is also affected by immobilization. The three major changes are orthostatic hypotension, increased cardiac workload, and thrombus formation.

Orthostatic hypotension is a drop of 20 mm Hg or more in systolic blood pressure and of 10 mm Hg in diastolic blood pressure within three minutes of when the patient rises from a lying or sitting position to a standing position (Medow et al., 2008). Decreased circulating fluid volume, pooling of blood in the lower extremities, and decreased autonomic response occur when a patient is immobile. These factors result in decreased venous return, followed by a decrease in cardiac output, which is reflected by a decline in blood pressure (McCance & Huether, 2010).

As the workload of the heart increases, its oxygen consumption does as well. The heart therefore works harder and less efficiently during periods of prolonged rest. As immobilization increases, cardiac output falls, further decreasing cardiac efficiency and increasing workload.

Patients are also at risk for thrombus formation. A **thrombus** is an accumulation of platelets, fibrin, clotting factors, and the cellular elements of the blood attached to the interior wall of a vein or artery, sometimes occluding the lumen of the vessel (Figure 45-1). Three factors contribute to venous thrombus formation: (1) loss of integrity of the vessel wall (e.g., injury), (2) abnormalities of blood flow (e.g., slow blood flow in calf veins associated with bed rest), and (3) alterations in blood constituents (e.g., a change in clotting factors or increased platelet activity). These three factors are sometimes referred to as **Virchow's triad** (McCance & Huether, 2010). A dislodged venous thrombus, called an **embolus**, may travel through the circulatory system to the lungs and impair circulation and oxygenation. Venous emboli that travel to the lungs are called **pulmonary emboli** and may be life-threatening. More than 90% of all pulmonary emboli begin in the legs or pelvis (Copstead-Kirkhorn & Banaski, 2011).

Musculoskeletal Changes. The effects of immobility on the musculoskeletal system can include temporary or permanent impairment. Restricted mobility may result in loss of

Preface to the Instructor

The future of nursing in Canada is promising. Dynamic change and ongoing development of the discipline point to the need for extensive and wide-ranging knowledge as the foundation for nursing practice. The nurses of tomorrow will continue to need to practise outstanding nursing and demonstrate its importance in maintaining and improving the health of Canadians within the context of global health challenges. Nursing practice will be characterized by (a) critical thinking, (b) patient/client advocacy, (c) excellence in clinical decision making, and (d) client/patient/community teaching within a broad spectrum of health services. Moreover, nursing practice will involve engaging in knowledge translation and leadership development and advocating for health policy change at the local, national, and global level. *Canadian Fundamentals of Nursing* is designed for students at all levels of undergraduate nursing programs. The text provides comprehensive coverage of fundamental nursing concepts, knowledge, research, and skills essential for nursing practice.

The fifth edition of *Canadian Fundamentals of Nursing* has been extensively revised and thoroughly edited to include the most current evidence, issues, and future directions for nursing in Canada. All 48 chapters have been written or revised so that they reflect Canadian standards, traditions, research, and practice. *Canadian Fundamentals of Nursing* includes content covering the entire scope of primary, secondary, tertiary, rehabilitation, and end-of-life care. The focus is on the central role of primary health care in all areas of nursing practice. Emphasis is also placed on evidence-informed practice in skills and care plans to foster understanding of how research findings should guide clinical decision making. The book includes concept maps that demonstrate the relationships among nursing assessment, diagnosis, planning, intervention, and evaluation. First-person accounts, in the form of Nursing Story boxes, of issues that have arisen in nursing practice are designed to engage the student's attention and encourage more detailed reading and understanding.

For this edition, we have chosen to use both the terms “evidence-based practice” and “evidence-informed practice.” *Evidence-based practice* refers to the use of research findings in everyday practice. *Evidence-informed practice* reflects the need to be context-sensitive and to consider use of the best available evidence in dealing with everyday circumstances based on clinical judgement.

This textbook is the result of the combined efforts of many expert professionals committed to excellence. Expert contributors from across Canada approached the revisions with enthusiasm and worked hard to ensure that the content is current and reflects the Canadian health care system, Canadian health and social organizations, and uniquely Canadian health care issues. Reviewers scrutinized the chapters and made many helpful suggestions. We appreciate the conscientiousness and enthusiasm of all these dedicated professionals.

Classic Features

- **Comprehensive** coverage and readability of all fundamental nursing content are provided.
- **Full-colour** text is used to enhance visual appeal and instructional value.
- **Primary health care and health promotion** issues are discussed throughout the text.
- **Focus on Primary Health Care** boxes highlight how the principles of primary health care can be applied to the topic of the

chapter; the context of each of these boxes pertains uniquely to Canadian health care.

- **Research Highlight** boxes are integrated throughout the text to provide current nursing research studies and explain the implications for daily nursing practice.
- **Patient/client education** is highlighted in boxes that list teaching objectives, strategies, and evaluation for clinical topics throughout the text.
- **Evidence-informed/based practice** is discussed throughout the text.
- **Evidence-Informed Practice Guidelines** boxes provide examples of recent state-of-the-science guidelines for nursing practice.
- **Nursing principles** specific to the older adult are addressed throughout the text.
- **Historical boxes** entitled **Milestones in Canadian History** provide information about nursing leaders and critical events in Canadian nursing history.
- **Nursing Story** boxes present first-person accounts of issues in relation to chapter content.
- **Nursing Care Plans** guide students on how to conduct an assessment and analyze the defining characteristics that indicate nursing diagnoses. The plans include Nursing Interventions Classification (NIC) and Nursing Outcomes Classification (NOC) to familiarize students with this important nomenclature. The evaluation sections of the plans show students how to determine the expected outcomes and evaluate the results of care.
- **Concept Maps** demonstrate the relationship between nursing assessment, diagnosis, planning, intervention, and evaluation.
- **Procedural Guidelines** boxes provide step-by-step instructions and photos about how to perform basic skills.
- **Video icons** indicate video clips associated with specific skills that are available in the Evolve Student Learning Resources.
- **End-of-chapter review questions** assist students to critically review what they have learned. Answers and rationales are provided at the end of this textbook.
- The annotated **Recommended Web Sites** sections at the end of each chapter direct the student to current resources.
- The **Laboratory Values** appendix (Appendix B) is a concise, up-to-date source of current laboratory values for use in clinical practice.

New Features

- A new addition to **Global Health, Culture, and Diversity** (Chapter 9) is the evolving area of global health relative to social justice and global health inequities. To contribute to nurses' understanding of global health, key concepts of global citizenship, health equity, cultural safety, and diversity in relation to nursing practice are discussed.
- The revised **Community Health Nursing Practice** chapter (Chapter 4) now includes discussions of environmental health.
- The updated **Family Nursing** chapter (Chapter 19) includes consideration of family *in context*, or family nursing as relational inquiry. This extends the previous chapter's discussion of family *as context* and family *as client*. The new content emphasizes the need for nurses to explore the geopolitical, economic, and social influences that are at play when families encounter illness or other life transition challenges.

- A revised chapter on **Older Adulthood** (Chapter 24) includes the concepts of aging well and quality of life for older adults.
- Updates to the chapter on **Spiritual Health** (Chapter 27) include empirical evidence supporting the relationship of spirituality to health, and the chapter has been augmented with a section on the mind-body connection. Current evidence on spiritual care practices and what patients expect from nurses has been added. A theoretical shift is a focus away from nursing assessment towards understanding and reflecting on spirituality in a deeper sense for both nurses and patients. This shift is in keeping with the assumption that spirituality in practice is a co-created learning rather than one in which nurses take an expert role. A section on spirituality and ethics has been added to support students' considerations of the ethical dimensions of care in the area of spiritual health.
- An updated **Sensory Alterations** chapter (Chapter 47) includes the addition of a substantial amount of content on sensory changes, particularly content on vision and hearing. New Canadian resources have been added.
- **References** have been updated throughout to include Canadian research and practice standards, such as the best nursing practice guidelines of Health Canada, Statistics Canada, the Canadian Nurses Association (CNA), and the Registered Nurses Association of Ontario (RNAO). References have been organized by chapter and compiled at the end of the text.
- **Media Resources** listed at the beginning of each chapter detail the available Evolve resources.
- An updated **Practical Nursing in Canada** appendix (Appendix A) provides important information on this nursing role in Canada.

Learning Supplements for Students

- The **Evolve Student Resources** are available online at <http://evolve.elsevier.com/Canada/Potter/fundamentals/> and include the following valuable learning aids, organized by asset:
 - Animations
 - Audio Glossary
 - Calculation Tutorial
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 - Fluids and Electrolytes Tutorial
 - Interactive Learning Activities
 - Key Term Flashcards
 - Printable versions of Chapter Key Points
 - Skills Performance Checklists for each skill in the text
 - Video Clips highlighting common skills
- A thorough **Study Guide With Skills Performance Checklists** provides an ideal supplement to help students understand and apply the content of the text. Each chapter includes multiple sections:
 - **Preliminary Reading** includes a chapter assignment from the text.
 - **Comprehensive Understanding** provides a variety of activities to reinforce the topics and main ideas from the text.
 - **Review Questions** are multiple-choice, requiring students to provide rationales for their answers. Answers and rationales are provided in the answer key.
 - **Clinical chapters** include critical thinking models that expand the case study from the chapter's care plan. Students are asked to develop a step in the model on the basis of the actions of the nurse and patient in the scenario. This helps

students learn to apply both content learned and the critical thinking synthesis model.

- **Skills Performance Checklists** are included so that students can evaluate skill competency.
- The handy **Clinical Companion: Just the Facts** complements, rather than abbreviates, the textbook. Content is presented in tabular, list, and outline formats that equip your students with a concise, portable guide to all of the facts and figures they'll need to know in their early clinical experiences.
- **Virtual Clinical Excursions** is an exciting workbook and CD-ROM package that brings learning to life in a virtual hospital setting. The workbook guides students as they care for patients, providing ongoing challenges and learning opportunities. Each lesson in *Virtual Clinical Excursions* complements the textbook content and provides an environment for students to practice what they are learning. This CD/workbook is available separately or packaged at a special price with the textbook.

Teaching Supplements for Instructors

- The **Evolve Instructor Resources** (available online at <http://evolve.elsevier.com/Canada/Potter/fundamentals/>) are a comprehensive collection of the most important tools instructors need, including the following:
 - **TEACH for Nurses** ties together every chapter resource you need for the most effective class presentations, with sections dedicated to objectives, teaching focus, instructor chapter resources, answers to chapter questions, and an in-class case study discussion. Teaching strategies include content highlights, student activities, online activities, and large group activities.
 - The revised **Test Bank** contains more than 900 multiple-choice questions with text page references and answers coded for CRNE competencies and cognitive level. The ExamView software allows instructors to create new tests; edit, add, and delete test questions; sort questions by category, cognitive level, and question type; and administer and grade online tests.
 - **Revised PowerPoint Presentations** include over 1500 slides for use in lectures.
 - The **Image Collection** contains more than 1100 illustrations from the text for use in lectures.
 - **Simulation Learning System** is an online toolkit that helps instructors and facilitators effectively incorporate medium- to high-fidelity simulation into their nursing curriculum. Detailed patient scenarios promote and enhance the clinical decision-making skills of students at all levels. The system provides detailed instructions for preparation and implementation of the simulation experience, debriefing questions that encourage critical thinking, and learning resources to reinforce student comprehension. Each scenario in the Simulation Learning System complements the textbook content and helps bridge the gap between lectures and clinicals. This system provides the perfect environment for students to practise what they are learning in the text for a true-to-life, hands-on learning experience.

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instructionally designed lessons focus on topics that are difficult to master and pose a high risk to the patient if done incorrectly. Lesson quizzes allow students to check their learning curve and review as needed, and the module exams feed out to an instructor grade book. Modules cover Airway Management, Blood Therapy, Bowel Elimination/Ostomy Care, Chest Tubes, Enteral Nutrition, Infection Control, Injections, IV Fluid Administration, IV Fluid Therapy Management, IV Medication Administration, Nonparenteral Medication Administration, Safe Medication Administration, Safety, Specimen Collection,

Urinary Catheterization, Vascular Access, Vital Signs, and Wound Care. It is available alone or packaged with the text.

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Health and Wellness

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objectives

Mastery of content in this chapter will enable you to:

- Define the key terms listed.
- Discuss ways that definitions of health have been conceptualized.
- Describe key characteristics of medical, behavioural, and socioenvironmental approaches to health.
- Identify factors that have led to each approach to health.
- Discuss contributions of the following Canadian publications to conceptualizations of health and health determinants: *Lalonde Report*, *Ottawa Charter*, *Epp Report*, *Strategies for Population Health*, *Jakarta Declaration*, *Bangkok Charter*, *Toronto Charter*.
- Discuss key health determinants and their interrelationships and how they influence health.
- Contrast distinguishing features of health promotion and disease prevention.
- Describe the three levels of disease prevention.
- Identify and give examples of the five health promotion strategies discussed in the *Ottawa Charter*.
- Analyze how the nature and scope of nursing practice are influenced by different conceptualizations of health and health determinants.

key terms

- | | |
|---|--|
| Behavioural approach, p. 3 | Illness, p. 2 |
| Behavioural risk factors, p. 3 | Medical approach, p. 3 |
| Determinants of health, p. 7 | Physiological risk factors, p. 3 |
| Disease, p. 2 | Population health approach, p. 5 |
| Disease prevention, p. 10 | Prerequisites for health, p. 4 |
| Health, p. 2 | Psychosocial risk factors, p. 4 |
| Health as actualization, p. 2 | Social determinants of health, p. 6 |
| Health as actualization and stability, p. 2 | Socioenvironmental approach, p. 4 |
| Health as stability, p. 2 | Socioenvironmental risk conditions, p. 4 |
| Health disparities, p. 6 | Wellness, p. 2 |
| Health field concept, p. 3 | |
| Health promotion, p. 10 | |
| Health promotion strategies, p. 11 | |

media resources

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Concepts of health and what determines health have changed significantly since the 1970s. This conceptual change has major implications for Canadian nursing in the twenty-first century because how you perceive health—and what determines it—influences the nature and scope of nursing practice. The importance of health to nursing is reflected in nursing models and frameworks, in which health is one of the “metaparadigm” concepts along with *person*, *environment*, *nursing*, and, more recently, *social justice* (see Chapter 4). In each framework, health concepts are congruent with the assumptions and focus of the model.

Conceptualizations of Health

Discussion about the nature of health revolves around its relationship to *disease*, *illness*, and *wellness*. Often, debates focus on whether health is defined in negative or positive terms. When health is negatively defined as the absence of disease, health and illness are represented on a continuum, with maximum health at one end and death at the other. When health is positively defined, however, health and illness are viewed as distinct but interrelated concepts. Therefore, a person can have disease, such as a chronic pathological condition, and have healthy characteristics as well.

Many people use the words *illness* and *disease* interchangeably. Others suggest that **disease** is an objective state of ill health, the pathological process of which can be detected by medical science, whereas **illness** is a subjective experience of loss of health (Jensen & Allen, 1993; Labonte, 1993). Figure 1-1 shows the relationships among health, illness, and disease.

Definitions of health beyond the absence of disease usually have multidimensional components, including physical, mental, social, and spiritual health. Some scholars have considered this broad definition of health to be synonymous with wellness (Labonte, 1993; Pender, Murdaugh, & Parsons, 2006). Others have argued that **health** is an objective process characterized by functional stability, balance, and integrity, whereas **wellness** is a subjective experience (see discussion by Mackey, 2009). The word *health* is derived from the Old English word *hoelth*, meaning whole of body. Historically, physical wholeness was important for social acceptance, and people with contagious or disfiguring diseases were often ostracized. Good health was considered natural, whereas disease was considered unnatural. As science progressed, disease was regarded less negatively because it could be countered by scientific medicine. After World War II, the World Health Organization (WHO) (1947) in its constitution defined health as “a state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity.” This is still the most commonly cited definition of health.

Classifications of Health Conceptualizations

Pender et al. (2006) classified health in three ways:

- **Health as stability.** Health is defined as the maintenance of physiological, functional, and social norms, and it relates to concepts of adaptation and homeostasis.
- **Health as actualization.** Health is defined as the actualization of human potential. Scholars and researchers who adhere to this definition often use the terms *health* and *wellness* interchangeably.
- **Health as actualization and stability.** Both actualization and stability concepts are incorporated in the definition of health as “the actualization of inherent and acquired human potential through goal-directed behaviour, competent self-care and satisfying relationships with others, while making adjustments as needed to maintain structural integrity and harmony with relevant environments” (Pender et al., 2006, p. 23).

In 1984, the WHO updated its conceptualization of health as:

the extent to which an individual or group is able, on the one hand, to realize aspirations and satisfy needs; and, on the other hand, to change or cope with the environment. Health is, therefore, seen as a resource for everyday life, not the objective of living; it is a positive

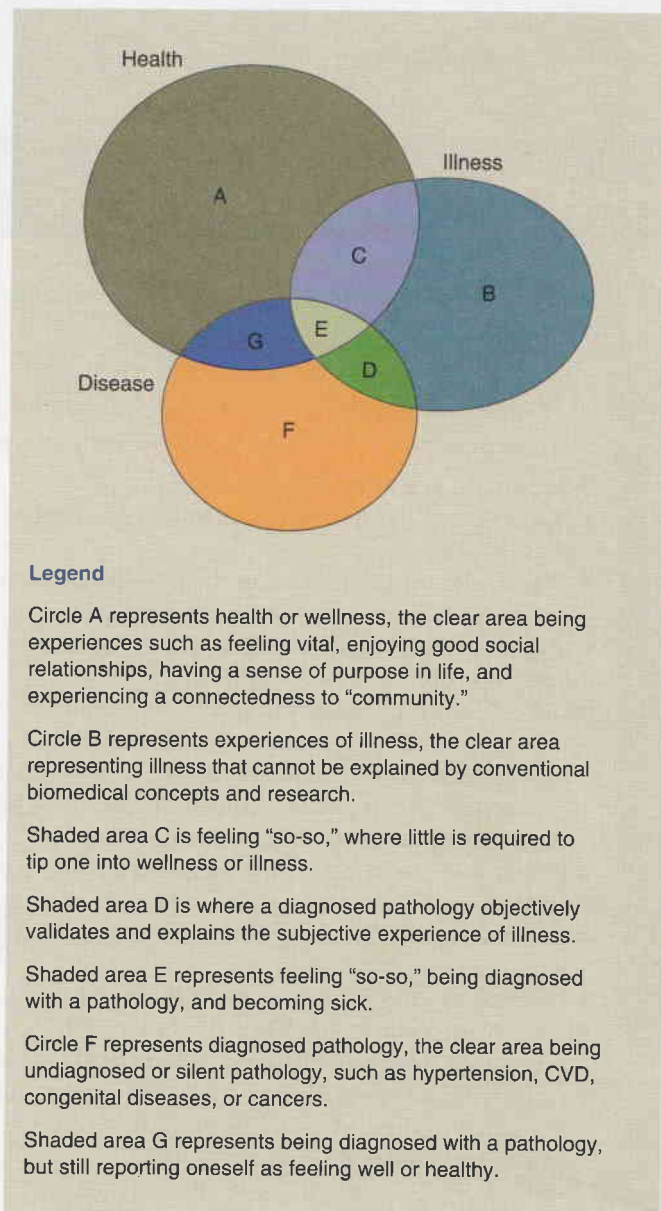


Figure 1-1 Health, illness, and disease. **Source:** From Labonte, R. (1993). *Issues in health promotion series. 3. Health promotion and empowerment: Practice frameworks* (p. 18). Toronto: Centre for Health Promotion, University of Toronto, & ParticipACTION.

concept emphasizing social and personal resources, as well as physical capacities. (p. 3)

Rather than viewing health as an ideal state of well-being (as in the 1947 WHO definition), this definition, incorporating both actualization and stability dimensions, suggests that people in a variety of situations—even those with physical disease or nearing death—could be considered healthy.

Labonte (1993) developed a multidimensional conceptualization of health that reflects both actualization and stability perspectives. Aspects include the following qualities:

- Feeling vitalized and full of energy
- Having satisfying social relationships
- Having a feeling of control over one’s life and living conditions

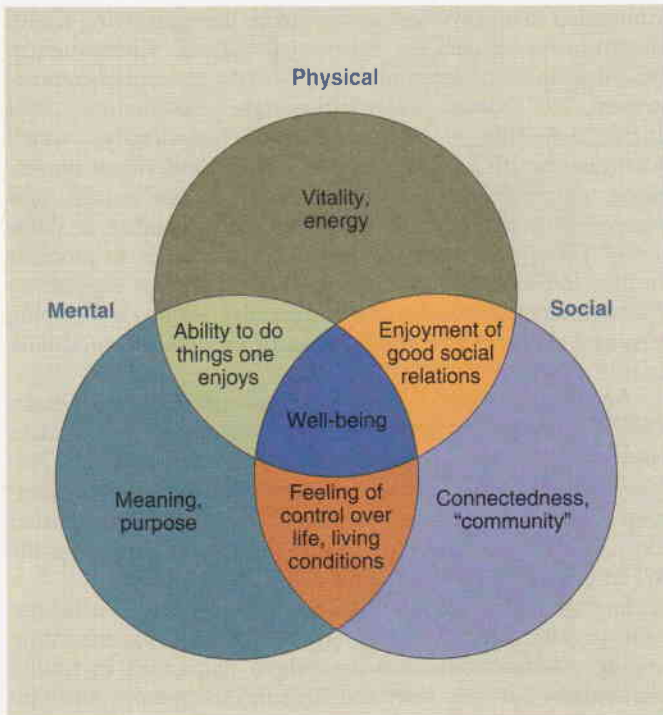


Figure 1-2 Dimensions of health and well-being. **Source:** From Labonte, R. (1993). *Issues in health promotion series. 3. Health promotion and empowerment: Practice frameworks* (p. 20). Toronto: Centre for Health Promotion, University of Toronto, & ParticipACTION.

- Being able to do things that one enjoys
- Having a sense of purpose
- Feeling connected to community

Using the WHO dimensions of physical, mental, and social well-being, Labonte (1993) categorized these characteristics using a Venn diagram (Figure 1-2). The diagram clearly depicts the concept of holism, whereby health is more than the sum of the component parts in that the interrelationships between and among different components result in different aspects of health.

Nurse scholars conceptualize health in different ways (see Chapter 5). For example, the McGill Model of Nursing concept of health as coping and development is very congruent with the WHO (1984) definition (Gottlieb & Gottlieb, 2007). Jones and Meleis (1993) articulated health as empowerment: “Health is being empowered to define, seek, and find conditions, resources, and processes to be an effective agent in meeting the significant needs perceived by individuals” (p. 12). This conceptualization is congruent with Labonte’s (1993) focus and reflects the essence of health promotion, to be discussed later. In a review of the concept of health, Raeburn and Rootman (2007) suggested that in view of current realities of the twenty-first century, a definition of health needs to be positive (not based on pathology or deficit), comprehensive (with a broad set of determinants), particularly attentive to the mental health dimension, and inclusive of quality of life and spirituality.

Historical Approaches to Health in Canada

Definitions of health emerge from different contexts. In modern times, the three major approaches to health have been medical,

behavioural, and socioenvironmental (Labonte, 1993). These approaches offer a useful framework for examining the evolution of health orientations in Canada.

Medical Approach

The **medical approach**, which represents a stability orientation to health, dominated Western thinking for most of the twentieth century. It emphasizes that medical intervention restores health. Health problems are defined primarily as **physiological risk factors**—physiologically defined characteristics that are precursors to or risk factors for disease. Examples include hypertension, hypercholesterolemia, genetic predispositions, and obesity. The biopsychosocial view of health (Engel, 1977) includes psychological and social elements; however, in practice, a medical focus on pathology was retained (Antonovsky, 1987). In the medical approach, the health care system is paramount to ensuring that populations remain healthy.

Focusing on treatment of disease was strongly supported after World War II, when new technological and scientific medical advances facilitated the medical approach. In Canada, postwar economic growth increased funding to build new hospitals. National health insurance was created to remove financial barriers to care. Many people believed that scientific medicine could solve most health problems and that accessible and quality health care (or, more correctly, illness care) would improve the health of Canadians. Within this approach, less emphasis was given to health promotion and disease prevention.

Behavioural Approach

By the early 1970s, increasingly large amounts of money were spent on health care, but the health status of the population did not improve proportionately. To better understand what contributed to illness and death, the Minister of Health and Welfare, Marc Lalonde, commissioned a study that resulted in the 1974 report *A New Perspective on the Health of Canadians*. This so-called *Lalonde Report* shifted emphasis from a medical to a **behavioural approach** to health. The report concluded that the traditional medical approach to health care was inadequate and that “further improvements in the environment, reductions in self-imposed risks, and a greater knowledge of human biology” were necessary to improve the health status of Canadians (p. 6). The *Lalonde Report* was the first modern government document in the Western world to acknowledge the inadequacy of a strictly biomedical health care system.

The *Lalonde Report* broadly defined health determinants as *lifestyle, environment, human biology, and the organization of health care*. This **health field concept** was widely used, modified, and expanded by other countries, and its release was a turning point in broadening Canadians’ attitudes about factors that contribute to health, along with the role of government in promoting health (Health Canada, 1998). Of the four determinants, lifestyle received the most attention, perhaps because lifestyle behaviours contributed to chronic diseases (such as cancer and heart disease) and to injuries—both of which are the leading causes of morbidity and mortality in Canada (Labonte, 1993). In addition, greater understanding of behavioural social psychology revealed factors that motivated individuals to engage in healthy or unhealthy behaviours. In 1978, the Canadian government established the Health Promotion Directorate in the Department of National Health and Welfare, the first official health promotion undertaking of its kind. Its aim was to decrease **behavioural risk factors** such as smoking,

substance abuse, lack of exercise, and an unhealthy diet. Public health programs such as Operation Lifestyle and ParticipACTION were developed through this department.

The behavioural approach places responsibility for health on the individual, thereby favouring health promotion strategies such as education and social marketing. Strategies are often based on the assumption that if people know the risk factors for disease, then they will engage in healthy behaviours. Indeed, health-enhancing practices among Canadians increased during this time. With the ParticipACTION initiative, for instance, many people increased their physical activity. Antismoking campaigns led to a substantial decrease in tobacco use.

Socioenvironmental Approach

By the mid-1980s, however, the behavioural approach to health and illness prevention fell into disfavour. Studies showed that lifestyle improvements were made primarily by well-educated, well-employed, and higher-income Canadians. The *Lalonde Report* was criticized for deflecting attention from the environment and for how environment and lifestyle were defined. Lifestyle was viewed as being within an individual's control, with health risks as "self-imposed" behaviours. This supported "victim-blaming" and views that health was largely an individual responsibility. Critics suggested that health-related behaviours could not be separated from the social contexts (environments) in which they occurred. For example, living and working conditions were perceived as barriers to engaging in healthy behaviours (Labonte, 1993).

In the **socioenvironmental approach**, health is closely tied to social structures. For example, poverty and unhealthy physical and social environments, such as air pollution, poor water quality, and workplace hazards, are recognized as influencing health directly. Thus, Canadian public health providers expanded Lalonde's (1974) health field concept to emphasize the social context of health and the relationship between personal health behaviours and social and physical environments (Hancock & Perkins, 1985).

Internationally, more attention was also given to the social context of health. The WHO Regional Conference in Europe produced a discussion paper identifying the social conditions that influence health (WHO, 1984). Just as Canada led the behavioural approach to health with the *Lalonde Report*, it was now instrumental in focusing on social and environmental conditions. In 1986, the First International Conference on Health Promotion was held in Ottawa, sponsored by the WHO, the Canadian Public Health Association (CPHA), and Health and Welfare Canada. It produced a watershed document—the *Ottawa Charter for Health Promotion*—that supported a socioenvironmental approach. This document has since been translated into more than 40 languages.

Ottawa Charter. The *Ottawa Charter for Health Promotion* (WHO, 1986) identified **prerequisites for health** as peace, shelter, education, food, income, a stable ecosystem, sustainable resources, social justice, and equity. These prerequisites clearly go beyond lifestyles or personal health practices to include social, environmental, and political contexts. They place responsibility for health on society rather than only on individuals. The *Charter's* focus on social justice and equity also incorporated the concept of *empowerment*—a person's ability to define, analyze, and solve problems—as an important goal for health care providers (Registered Nurses Association of British Columbia, 1994). Indeed, Wallerstein (1992)

contended that powerlessness could be the underlying health determinant influencing other risk factors. Consequently, health promotion literature emphasizes the concept of empowerment. The *Ottawa Charter* incorporated the then-new 1984 WHO definition of health (discussed previously), which identified health as having both social and individual dimensions, emphasized its dynamic and positive nature, and viewed it as a fundamental human right (Naidoo & Wills, 1994). The *Charter* outlined five major strategies to promote health: building healthy public policy, creating supportive environments, strengthening community action, developing personal skills, and reorienting health services (detailed later in this chapter).

Achieving Health for All. Concepts from the *Ottawa Charter* were incorporated into another important Canadian document, *Achieving Health for All: A Framework for Health Promotion* (Epp, 1986). This report, developed under the leadership of Jake Epp, Minister of National Health and Welfare from 1984 to 1989, became Canada's blueprint for achieving the WHO goal of "Health for All 2000" (Figure 1-3).

Epp's (1986) report identified three major health challenges: reducing inequities, increasing prevention, and enhancing coping mechanisms. It acknowledged disparities in health, particularly between low- and high-income people, and that living and working conditions were critical determinants of health. It emphasized the need for effective ways to prevent injuries, illnesses, chronic conditions, and disabilities. Enhancing coping was an acknowledgement that the dominant diseases in Canada were chronic conditions that could not be cured. Therefore, the challenge is assisting people to manage and cope with chronic conditions in order to live meaningful and productive lives. The *Epp Report* emphasized society's responsibility for providing supports for people experiencing chronic medical conditions, stress, mental illness, and problems associated with aging, as well as the need for supports for caregivers. The report identified self-care, mutual aid, and healthy environments as ways that these challenges could be addressed, which reflected both personal and social responsibility. Specific strategies to address the challenges included fostering public participation, strengthening community health services, and coordinating healthy public policy.

The *Ottawa Charter* and the *Epp Report* each reflect a **socioenvironmental approach** in which health is seen as more than just the absence of disease and engaging in healthy behaviours; rather, this approach emphasizes connectedness, self-efficacy, and capacity to engage in meaningful activities (see Figure 1-2).

Risk Factors and Risk Conditions. Labonte (1993) categorized the major determinants of health in a socioenvironmental approach as psychosocial risk factors and socioenvironmental risk conditions:

- **Psychosocial risk factors** are complex psychological experiences resulting from social circumstances that include isolation, lack of social support, limited social networks, low self-esteem, self-blame, and low perceived power.
- **Socioenvironmental risk conditions** are social and environmental living conditions that include poverty, low educational or occupational status, dangerous or stressful work, dangerous physical environments, pollution, discrimination, relative political or economic powerlessness, and inequalities of income or power.

According to a socioenvironmental approach to health, political, social, and cultural forces affect health and well-being

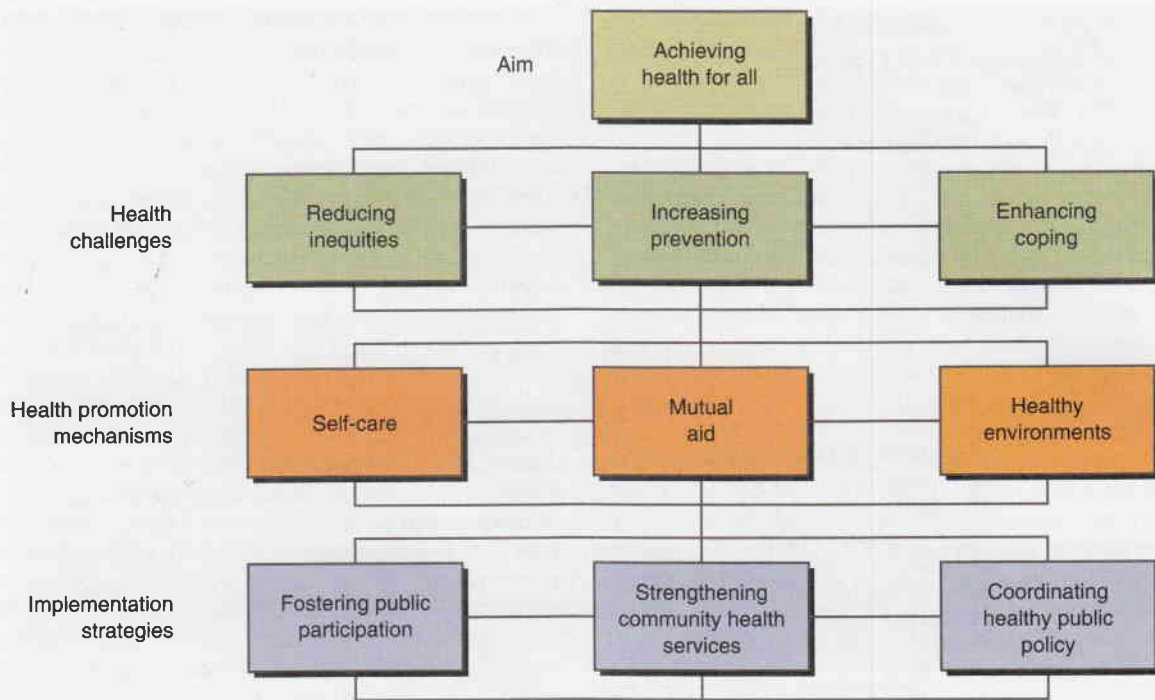


Figure 1-3 Achieving health for all: A framework for health promotion. **Source:** From Epp, J. (1986). *Achieving health for all: A framework for health promotion* (p. 8). Ottawa: Health and Welfare Canada. Reproduced with the permission of the Minister of Public Works and Government Services Canada, 2012.

both directly and indirectly through their influence on personal health behaviours. Socioenvironmental risk conditions can contribute to psychosocial risk factors, which can then result in unhealthy behaviours (Figure 1-4). This means that health care providers should recognize the influence of environment on personal behaviours and that “health-inhibiting” behaviours could be coping strategies for managing the stress created by living and working conditions that decrease access to resources. In other words, “to change behaviour it may be necessary to change more than behaviour” (Wilkinson, 1996, p. 64). For example, in addition to working “downstream” to assist people who are experiencing the negative health effects of socioenvironmental conditions, nurses need to work “upstream” by advocating for policies that ensure affordable housing, financial support to patients with low incomes, and safe, fulfilling work environments.

Strategies for Population Health. In Canada, the determinants of health have been further emphasized through the **population health approach**. This approach, initiated by the Canadian Institute for Advanced Research, was officially endorsed by the federal, provincial, and territorial ministers of health in the report titled *Strategies for Population Health: Investing in the Health of Canadians* (Federal, Provincial, and Territorial Advisory Committee on Population Health [ACPH], 1994). In a population health approach, “the entire range of known individual and collective factors and conditions that determine population health status, and the interactions among them, are taken into account in planning action to improve health” (Health Canada, 1998). The population health approach emphasizes the use of epidemiological data to determine the etiology of health and disease.

The key health determinants identified in the *Strategies for Population Health* report are as follows:

- Income and social status
- Social support networks
- Education
- Employment and working conditions
- Physical environments
- Biology and genetic endowment
- Personal health practices and coping skills
- Healthy child development
- Health services

In 1996, Health Canada added *gender, culture, and social environments* to this list. Note that the list includes determinants at the individual level (personal health practices and coping skills; biology and genetic endowment) and at the population level (education, employment, and income distribution).

Jakarta Declaration. The *Jakarta Declaration on Health Promotion Into the 21st Century* (WHO, 1997) emerged from the 4th International Conference on Health Promotion, the first to be held in a developing country and to involve the private sector. The *Jakarta Declaration* affirmed the *Ottawa Charter* prerequisites for health; added four other prerequisites (*empowerment of women, social security, respect for human rights, and social relations*); and declared poverty to be the greatest threat to health. The Declaration identified the following priorities for action: promoting social responsibility for health in public and private sectors; increasing investments for health in all sectors; consolidating and expanding partnerships for health to all levels of government and the private sector; increasing community capacity and empowering the individual; and securing adequate infrastructure for health promotion.

Bangkok Charter. The *Bangkok Charter for Health Promotion in a Globalized World* (WHO, 2005) affirmed health as a human right and emphasized mental and spiritual well-being

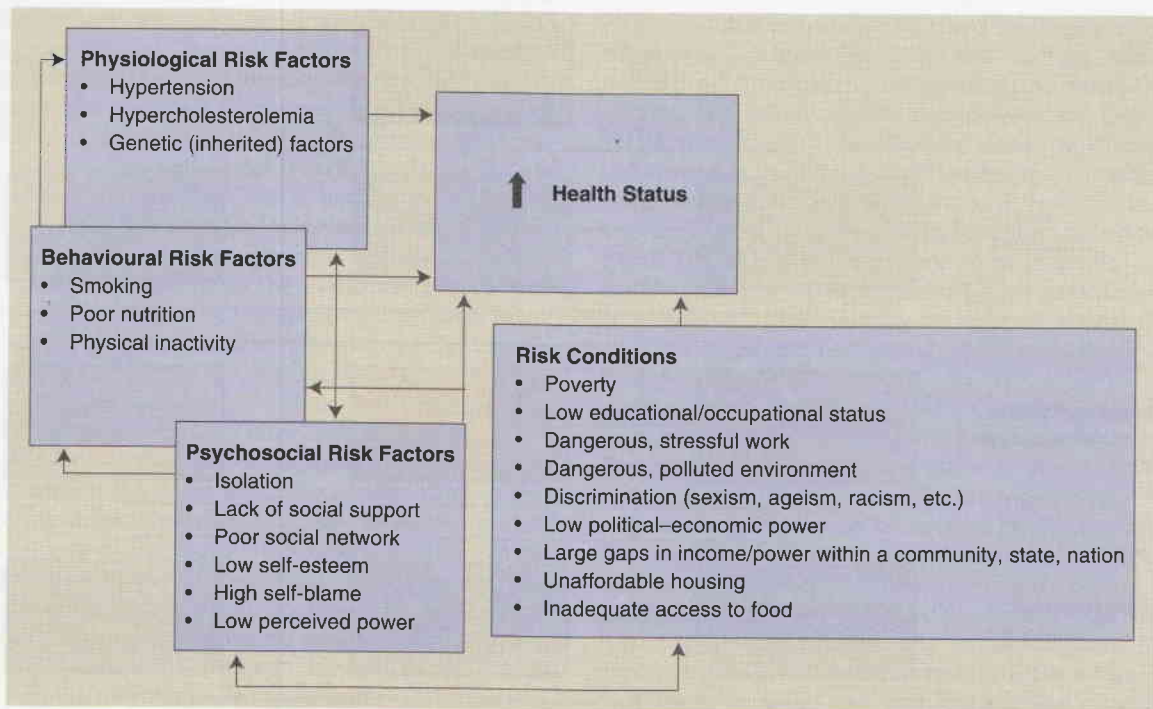


Figure 1-4 Socioenvironmental approach to health. **Source:** From Labonte, R. (1993). *Issues in health promotion series. 3. Health promotion and empowerment: Practice frameworks* (p. 11). Toronto: Centre for Health Promotion, University of Toronto, & ParticipACTION.

as important elements. It identified critical factors influencing health, such as the increasing inequalities within and between countries, global environmental change, and urbanization. The *Charter* emphasized strong political action and sustained advocacy, empowering communities with adequate resources, and corporate sector commitment to healthy workplaces and ethical business practices.

Toronto Charter. In the early to middle 1990s, Canadian social and health policies resulted in increased social and economic inequalities (Bryant, 2002; Raphael, 2009a) and health disparities. These concerns culminated in the *Toronto Charter on the Social Determinants of Health*, which identified the following social determinants as particularly important for health: Aboriginal status, early life, education, employment and working conditions, food security, gender, health care services, housing, income and its distribution, social safety net, social exclusion, and unemployment and employment security. **Social determinants of health** can be defined as “the economic and social conditions that shape the health of individuals, communities, and jurisdictions as a whole . . . [and] determine the extent to which a person possesses the physical, social, and personal resources to identify and achieve personal aspirations, satisfy needs, and cope with the environment” (Raphael, 2009a, p. 2; italics ours). This conceptualization of health determinants emphasizes societal responsibility for reducing health disparities because it focuses on how a society distributes economic and social resources through its economic and social policies. A social determinants of health perspective calls attention to the political, economic, and social forces that shape policy decisions, thereby reflecting a critical/structural approach to health (Bryant, 2009b). The social determinants of health identified in the *Toronto Charter* were chosen because they (a) are important to the health of Canadians, (b) are

understandable to Canadians, (c) have clear policy relevance to decision makers and citizens, and (d) are especially timely and relevant (Raphael, 2009a).

Concern about **health disparities** (i.e., differences in health status among different population groups) has been raised worldwide. The WHO Commission on Social Determinants of Health (WHO, 2008a) was charged with developing strategies to narrow health disparities through action on the social determinants of health. Nationally, the Health Disparities Task Group (2005), commissioned by the Public Health Agency of Canada (PHAC), identified socioeconomic status, Aboriginal identity, gender, and geographic location as the most important factors contributing to health disparities. In 2007, the Senate Subcommittee on Population Health was established to examine the impact of social determinants of health on disparities and inequities in health (Senate Subcommittee on Population Health, 2009). The *Report on the State of Public Health in Canada* (PHAC, 2008) by Canada’s first chief public health officer also underscored health inequalities.

Health disparities are associated with inequitable access (unfair or unjust lack of access) to health determinants resulting from economic and social policies; therefore, the term *health inequities* (rather than *health inequalities* or *disparities*) may more accurately reflect the source and nature of health differences (Reutter & Kushner, 2010b).

Determinants of Health

The following section introduces you to some of the major determinants of health affecting Canadians (Health Canada, 1996). Although each determinant on its own contributes to health, the determinants are also interrelated and influence each other.

Income and Social Status (Income Distribution)

Income and social status is the greatest **determinant of health** because it influences most other determinants (Canadian Institute for Health Information [CIHI], 2004; Raphael, 2009a). According to Statistics Canada after-tax low-income cut-offs in 2008, 9% of Canadians lived in poverty, with much higher rates among single mothers (21%) and unattached nonelderly women (36%) and men (28%) (National Council of Welfare, 2008). Aboriginal peoples, Canadians of colour, people with disabilities, and recent urban immigrants also have much higher rates of poverty compared to the Canadian average (see summary by Raphael, 2006).

Poverty exerts its effect on health through lack of material resources that support health, through higher levels of psychosocial stress, and through health-threatening behaviours to cope with limited resources and stress (Raphael, 2009a). Low-income Canadians are more likely to die early and to suffer from most diseases, regardless of age, sex, race, culture, or place of residence (Phipps, 2003). It is estimated that 23% of Canadians' premature loss of life can be accounted for by income differences (Raphael, 2009a). People with lower incomes are more likely to have chronic health problems, particularly cardiovascular disease and type 2 diabetes (Raphael et al., 2003; Raphael & Farrell, 2002; Wilkins et al., 2002); lower self-esteem, lower sense of mastery and coherence; and higher levels of depression (Federal, Provincial, and Territorial ACPH, 1999). With each step up the economic ladder, Canadians' health status improves, suggesting that this "social gradient" of health is related to more than absolute material deprivation (Raphael, 2009b).

Low birth weight, an important marker for subsequent poor child and adult health, has a 43% higher incidence in poor neighbourhoods than in higher-income neighbourhoods (Wilkins et al., 2002). Children living in poverty are more likely to have chronic diseases such as asthma, to visit emergency rooms, and to die from injuries (Canadian Institute of Child Health, 2000) and are at greater risk for cognitive difficulties, delayed vocabulary development, and behavioural problems (CIHI, 2004).

Income inequality (i.e., the increasing gap between the rich and the poor [Curry-Stevens, 2009]) also influences population health. Countries with greater economic inequality have lower overall health and life expectancies (Wilkinson & Pickett, 2009). Although the mechanisms responsible for this association are complex and still being explored, one explanation suggests that income inequality may result in less public investment in sectors that affect health, such as education, health services, transportation, and housing (Auger & Alix, 2009).

Social Support Networks

Social support affects health, health behaviours, and health care utilization (Carpiano, 2007; Mikkonen & Raphael, 2010) through practical, emotional, informational, and affirmational support (House, 1981). Indeed, some experts believe that relationships may be as important to health as established risk factors such as obesity, smoking, and high blood pressure (Federal, Provincial, and Territorial ACPH, 1999). A strong body of research links social support with positive health outcomes (Carpiano, 2007; Richmond et al., 2007; Tomaka et al., 2006); whereas social isolation, exclusion, and lack of supportive relationships increase stress and vulnerability to disease directly, as well as indirectly through increased risk behaviours

such as smoking, substance abuse, and overeating (Mikkonen & Raphael, 2010).

In general, Canadians have reported high levels of support (Federal, Provincial, and Territorial ACPH, 1999). Four of five Canadians reported they had someone to confide in, whom they could count on in a crisis or for advice, and who made them feel loved and cared for. Nevertheless, men, single parents, and lower-income Canadians generally reported less support than did their respective counterparts. Support from families and friends and from informal and formal groups can provide practical aid during times of crisis and emotional support in times of distress and change. Social support assists coping and behavioural changes and can help individuals solve problems and maintain a sense of mastery and control over their lives. A Canadian population-based study found that higher levels of support and mastery were associated with lower psychological distress for men and women (Gadalla, 2009). A survey of young parents in Alberta identified spouses, family, and friends as major sources of support in encouraging healthy behaviours (exercise, diet) by providing emotional, affirmational, and practical support, including child care and financial assistance (Reutter et al., 2001). Support interventions helped mothers of very preterm infants gain confidence in their parenting skills and understand their infants' medical conditions (Preyde, 2007) and helped low-income women reduce or quit smoking (Stewart, Kushner, et al., 2010). It is important to address social support in relation to not only individual behaviours but also the broader social, political, and economic context that shapes community norms, values, and behaviours (Richmond, 2007; Richmond & Ross, 2009).

Education and Literacy

Education and literacy are important influences on health status because they affect many other health determinants. Literacy can influence health both directly (e.g., reading medication prescriptions, baby formula instructions, safety instructions in workplaces) and indirectly through use of services, personal health practices, income, work environments, and stress levels. For example, people with low literacy skills are more likely to be unemployed, receive income support, earn minimum wages in unskilled jobs, have higher stress levels, and make less use of preventive services (Ronson & Rootman, 2009). Education increases job opportunities and income security, which provide knowledge and skills to solve problems and gain a sense of control (PHAC, 2004). People with higher education levels tend to smoke less, be more physically active, and have access to healthier foods and physical environments (Federal, Provincial, and Territorial ACPH, 1999).

Employment and Working Conditions

Employment and working conditions significantly affect physical, mental, and social health. Paid work provides financial resources, a sense of identity and purpose, social contacts, and opportunities for personal growth (Smith & Polanyi, 2009). Unemployment is linked to material and social deprivation, adoption of health-threatening coping behaviours, psychological stress, and physical and mental health problems (Mikkonen & Raphael, 2010).

Working conditions can support health or pose health hazards. Smith and Polanyi (2009) identified available, adequate, appropriate, and appreciative work as pillars of workplace health. Healthy workplaces include job and employment security, safe physical conditions, reasonable work pace, low

stress, opportunities for self-expression and individual development, participation, and work-life balance (Jackson, 2009). Temporary employees, part-time workers, and people working in low-wage jobs have high levels of job insecurity and frequent periods of unemployment. Often such jobs do not provide benefits or pensions, which can lead to uncertainty and stress (Menendez et al., 2007; Tompa et al., 2007). In 2000, more than one in four Canadian workers believed that their place of work was not healthy (Canadian Policy Research Networks, 2008). One-third of Canadian workers in 2003 reported high stress at work, with even higher rates (45%) for health care workers (Wilkins, 2007). Indeed, the concern regarding negative workplace conditions in the health sector is considerable; nurses have had the highest or second-highest rates of absenteeism of all workers in Canada since the early 1990s (Villeneuve & MacDonald, 2006). Workplace stress is linked to increased risk of physical injuries, high blood pressure, cardiovascular disease, depression, and increases in tobacco and alcohol use (Jackson, 2009). In 2003, almost 10% of Canadian workers in trades, transport, and equipment operation sustained on-the-job injuries, which is more than four times the rate among workers in the “white-collar” sector (Wilkins & Mackenzie, 2007).

Physical Environments

Housing, indoor air quality, and community planning are important determinants of health. Contaminants in air, water, food, and soil also adversely affect health, sometimes contributing to cancer, birth defects, respiratory illness, and gastrointestinal ailments. Children from low-income families, who often live in substandard housing and in neighbourhoods near highways and industrial areas, are particularly likely to be exposed to these contaminants (Center for Quality Growth and Regional Development, 2006). Asthma, which is characterized by high sensitivity to airborne contaminants, is the most common chronic respiratory disease among children, accounting for 25% of all school absenteeism (Canadian Council on Social Development, 2006); children in poverty are particularly vulnerable to this disease (Lethbridge & Phipps, 2005).

Involuntary exposure to tobacco smoke (second-hand smoke) has received considerable attention in Canada. There is no safe level of exposure to second-hand tobacco smoke (WHO, 2009). It can increase children's risk for sudden infant death syndrome, acute respiratory infections, ear problems, and reduced lung development, and can increase adults' risk for coronary heart disease and lung cancer (US Department of Health and Human Services, 2006). Municipalities throughout Canada have incorporated smoking bans in public places (and in several jurisdictions, smoking bans in private cars when children are present). In 2005, 23% of nonsmokers reported regular exposure in at least one venue (public place, home, or vehicles), and children were at highest risk for exposure (Shields, 2007).

Another important aspect of the environment is affordable, suitable, and adequate housing. Homelessness in Canada is increasing, in part because of reduced government funding of social housing and lack of affordable rental accommodation (Bryant, 2009a; Khandor & Mason, 2007). Homeless populations are at greater risk for a variety of health problems, including mental illness, substance abuse, suicide, tuberculosis, injuries and assaults, chronic medical conditions (e.g., respiratory and musculoskeletal), and poor oral and dental health, and for early death (Frankish et al., 2005; Khandor & Mason,

2007). Inadequate and insecure housing can affect health *directly* (e.g., presence of lead, asbestos, poor heating systems, overcrowding, dampness) and *indirectly* through its influence on other determinants (Bryant, 2009a). Spending a disproportionate amount of income on rent, for example, reduces the amount of money that families can spend on food, clothing, recreation, and health care. The determinant of physical environment also includes the effects of climate change on the health of populations and the planet itself. The Canadian Nurses Association has produced several documents related to nursing's role in addressing climate change (2008, 2009), including an excellent video and educational module available on its Web site. The need for sustainable ecosystems, a prerequisite for health first identified in the *Ottawa Charter*, is clearly becoming more critical; however, the relationship between human and environmental health is a relatively recent focus for nursing (Hansen-Ketchum, et al., 2009).

Biological and Genetic Endowment

Heredity is strongly influenced by social and physical environments, and considerable effort has been expended to prevent congenital defects through monitoring and improved preconception and prenatal care (Federal, Provincial, and Territorial ACPH, 1999). This effort has led to substantial decreases in anomalies at birth. Yet, there is also increasing recognition that nature and nurture are not dichotomous influences on health but that “the social environment has a profound impact upon the function of one's genes, providing the context and stimulus for the variable expression of an inherited code” (Denburg & Daneman, 2010, p. 28).

Age is also a strong determinant of health. Many older people develop chronic diseases, although disability can be reduced with healthy aging (Healthy Aging and Wellness Working Group, 2006). Indeed, 70% of older people in Canada report good overall health, including good functional health and independence in activities of daily living (Shields & Martel, 2006). Nurses need to consider how much of the decline associated with aging is related to biological aging versus other determinants such as socioeconomic status, social support, and individual health practices.

Individual Health Practices and Coping Skills

Effective coping skills help people face challenges without resorting to risk behaviours such as substance abuse. Many so-called risk behaviours may, in fact, be coping strategies for stress and strain caused by living circumstances. For example, considerable evidence reveals that low-income women use smoking as a coping strategy (Stewart et al., 2011). Three risk behaviours with major detrimental health consequences are physical inactivity, poor nutrition, and tobacco use.

Physical inactivity is a major risk factor for some types of cancer, diabetes, cardiovascular disease, osteoporosis, obesity, hypertension, depression, stress, and anxiety. In 2004, just over half (52%) of Canadians aged 12 and older were at least moderately active during their leisure time (equivalent to walking at least 30 to 60 minutes a day). Those who were active were more likely to rate their health as excellent or very good and to report lower levels of stress and were less likely to be overweight, obese, or hypertensive (Gilmour, 2007). However, actual physical measures of activity using accelerometer technique revealed that only 15% of Canadian adults meet the recommendation of 150 minutes of MVPA (moderate to vigorous physical activity) weekly (Colley et al., 2011b) and only 7%

of children achieve the recommendation of 60 minutes of MVPA at least 6 days per week (Colley et al., 2011a). *Poor nutrition*, particularly overconsumption of fats, sugars, and salt, is linked to such diseases as some cancers, cardiovascular diseases, type 2 diabetes, hypertension, osteoarthritis, and gallbladder disease and to functional limitations and disabilities (Tjepkema, 2006). Obesity is considered to be a major public health threat, and in 2010, the federal government launched a country-wide intersectoral initiative to curb child obesity (PHAC, 2010). The 2004 Canadian Community Health Survey (CCHS) revealed that 23% of adult Canadians were obese (body mass index [BMI] of 30 or more) and 36% were overweight (Shields, 2006); as BMI increased, so did the likelihood of reporting high blood pressure, diabetes, and heart disease. About 26% of children (aged 2–17 years) were overweight or obese (Shields, 2006). The 2004 CCHS (Nutrition section) revealed that 70% of children aged 4–8 years ate fewer than the minimum five servings of vegetables and fruit daily. Moreover, 25% of Canadians overall (and one-third of teenagers aged 14–18) had eaten at fast-food outlets the previous day (Garriguet, 2007), which feature foods high in fats and salt. Several factors influence food consumption patterns, including household income, food advertising, and availability of nutritious choices. *Food insecurity* (the limited or uncertain availability of nutritious foods) is a growing problem in Canada. In 2004, more than 40% of households with low or lower middle incomes reported food insecurity (Ledrou & Gervais, 2005); those receiving social assistance were particularly vulnerable. In March 2010, over 800,000 Canadians were assisted by food banks, a 9% increase over 2009 and the highest level on record. Over half (51%) of these users were social assistance recipients, and 51% were families with children, half of whom were two-parent families (Food Banks Canada, 2010). Food insecurity is significantly associated with multiple chronic conditions, distress, and depression (Tarasuk, 2009).

Tobacco use remains the leading preventable cause of death and disease in Canada (Makamowski Illing & Kaiserman, 2004). It is the only legal consumer product that can harm everyone exposed to it—and it kills up to half of those who use it as intended (WHO, 2008b). For every person who dies from smoking, another 20 continue to suffer with at least one serious tobacco-related illness, such as coronary heart disease, lung diseases, and cancers (US Department of Health and Human Services, 2010). The smoking rate in Canada in 2009 was 18% (Health Canada, 2011b), but this burden is over-represented in more vulnerable populations, including those living in poverty (Physicians for a Smoke-free Canada, 2005) and Aboriginal people (Health Canada, 2011a). Half of all people with mental illness smoke, of whom 40% smoke more than 25 to 30 cigarettes per day, compared with 15% in the general population (de Leon & Diaz, 2005).

Clearly, many factors influence individual health behaviours (e.g., income, education, culture, and social support). Developing and maintaining health-enhancing behaviours requires not only health education but also social policies related to income security, product marketing, and supportive environments that make healthy choices the “easy” choices. In short, education is a necessary but not sufficient strategy.

Healthy Child Development

All determinants influence child development, but healthy child development is a separate determinant because of its importance to lifelong health. Increasing evidence reveals that

events during conception and through the age of 6 years influence children’s health for the rest of their lives (CIHI, 2004; Gluckman et al., 2010; Halfon et al., 2010; McCain et al., 2007). Three conditions for healthy child development are adequate and equitable income, effective parents and families, and supportive community environments (CIHI, 2004; Conroy et al., 2010).

Conception through the early years of childhood constitutes a critical period for biological and brain development that strongly shapes learning, behaviour, and health over the life course (McCain et al., 2007). Children raised in adverse environments are predisposed to coronary health disease, hypertension, type 2 diabetes, substance abuse, and mental health problems (McCain et al., 2007). Throughout the toddler, preschool, and school-age years, meeting a child’s development needs is crucial. Family environment is important, particularly establishing attachment to a primary caregiver who provides a basis for emotional and social well-being. Family conflict, violence, and poverty threaten healthy child development. Schools in which students feel secure, respected, challenged, and cared for help ensure that children succeed academically. Community support is also important (McCain et al., 2007).

Quality early childhood education and care are particularly important in early child development, so much so that they have been singled out by some researchers as a combined social determinant of health (Friendly, 2009). High-quality programs promote cognitive development and social competence and support parents in education and employment. Canada has acknowledged the importance of early childhood intervention through its Early Childhood Development Initiative (Health Council of Canada, 2006); however, Canada lacks a national child care program.

Health Services

Approximately 25% of a population’s health status is attributed to the health care services (Senate Subcommittee on Population Health, 2009). Quality and accessible primary care, hospital care, long-term care, home care, and public health services are therefore important. Prenatal care, well-child and immunization clinics, education services about health practices, and services that maintain older adults’ health and independence are important examples of preventive and primary health care services (discussed further in Chapters 2 and 4). Principles of the *Canada Health Act*—universality, portability, accessibility, comprehensiveness, and public administration—apply to hospital and physician services, which cover only 70% of total health care costs. Medicare does not cover drug costs or dental care, and home care coverage varies across provinces (Mikkonen & Raphael, 2010), contributing to inequitable access. Increasingly, the trends in health care service provision are from institutionalized care to community-based care, toward decision making that is based on the best available evidence, and toward more regional administration. Considerable monies have been invested in initiatives that incorporate principles of primary health care; however, the progress in this regard has been relatively slow (Health Council of Canada, 2011).

Gender

Gender is “the array of society-determined roles, personality traits, attitudes, behaviours, values, relative power, and influence that society ascribes to the two sexes on a differential basis” (PHAC, 2004) and must examine men’s as well as

women's experiences (Bates et al., 2009). Many health issues are a function of gender-based social roles, and gender can influence health status, behaviours, and care (Armstrong, 2009; Bates et al., 2009; Spitzer, 2005); gender also influences all other health determinants (Armstrong, 2009). In Canada, men are more likely than women to experience extreme forms of social exclusion and to die prematurely, largely as a result of heart disease, unintentional fatal injuries, cancer, and suicide. Women, however, are more likely to suffer from depression, stress (often resulting from efforts to manage paid and family work), chronic conditions such as arthritis and allergies, and injuries and death from family violence (Federal, Provincial, and Territorial ACPH, 1999; Mikkonen & Raphael, 2010). Moreover, gender influences men's and women's experience of sex-specific health concerns (e.g., pregnancy, prostate cancer, presentation of cardiovascular signs and symptoms), exposure to potential risk conditions (e.g., caregiving demands as traditionally women's responsibility), and interactions with health care providers (e.g., gender stereotypes, medicalization of health experience) (Pederson & Raphael, 2006).

Culture

Cultural and ethnic factors influence people's interactions with a health care system, their participation in prevention and health promotion programs, their access to health information, their health-related lifestyle choices, and their understanding of health and illness (Health Canada, 1996). Cultural factors also influence whether and how determinants are met (see Chapter 9). Among immigrants and refugees, health is negatively affected by unmet expectations, challenges to successful social integration, and difficulties arising from underemployment or unemployment, low income, and food and housing insecurity (Anderson et al., 2010; Dean & Wilson, 2009; Mikkonen & Raphael, 2010; Stewart, Makwarimba, et al., 2010). Language differences can lead to isolation and decreased social support networks. Prejudice can cause individuals to be denied opportunities for education, employment, and access to housing (Health Canada, 1996). Aboriginal peoples are much more likely to suffer acute and chronic diseases and experience higher infant mortality and shorter life expectancy than the general Canadian population (Mikkonen & Raphael, 2010). It is important to acknowledge the intersection of culture with other health determinants such as social support, employment, and income.

Social Environments

Social environments are defined as "the array of values and norms of a society [that] influence in varying ways the health and well-being of populations. In addition, social stability, recognition of diversity, safety, good working relationships, and cohesive communities provide a supportive society that reduces or avoids many potential risks to good health" (PHAC, 2004). The social environment is clearly related to other factors and expands on the social support determinant by incorporating broader community characteristics, norms, and values. Healthy social environments include freedom from discrimination and prejudice—particularly for people marginalized by income, age, gender, activity limitations, ethnicity, and sexual orientation. The determinant of social environment is also evident in the *Jakarta Declaration's* prerequisites of human rights, social security, and social relations (WHO, 1997). These prerequisites relate to social exclusion—the process by which people are denied opportunities to participate in many aspects

of cultural, economic, social, and political life (Galabuzi, 2004). People most likely to be excluded are poor citizens, Aboriginal people, new Canadians, and members of racialized or non-white groups. Social exclusion limits people's access to the resources that support health and their participation in community life (Stewart et al., 2008). A sense of community belonging has been linked to better self-rated general health and mental health (Shields, 2008).

Another important aspect of the social environment is the absence of violence, both in the home and in the community. In 2004, 7% of Canadians aged 15 years and older had experienced spousal violence in the previous five years; Aboriginal people were at a three-fold greater risk, and women were more likely to suffer from serious types of violence. Children accounted for 21% of cases of physical assault and 61% of cases of sexual assault, and close to 40% of elderly women suffered some kind of assault from family members (Canadian Centre for Justice Statistics, 2005). The health effects of family violence are devastating, for those experiencing or exposed to violence and for the perpetrators, and include psychological, physical, behavioural, academic, sexual, interpersonal, self-perceptual, or spiritual consequences, which may appear immediately or over time (Department of Justice Canada, 2009).

Violence is also experienced in other venues, particularly schools and workplaces. More than one-third (36%) of Canadian students in grades 6–10 reported being victims of bullying. Victimized children are at risk for anxiety, depression, loss of self-esteem, and somatic complaints; perpetrators are also at risk for long-term problems such as antisocial behaviour and substance use (Craig & Edge, 2008). Health care workers, including nurses, have experienced violence perpetrated by clients, family members, and co-workers (Duncan et al., 2001; Shields & Wilkins, 2009).

Strategies to Influence Health Determinants

Health Promotion and Disease Prevention

The understanding that health is qualitatively different from disease has led to a differentiation of the concepts of health promotion and disease prevention, although they are interrelated. Pender et al. (2006) differentiated between health promotion and disease prevention as follows: **health promotion** is "directed toward increasing the level of well-being and self-actualization" (p. 37); **disease prevention** (particularly primary prevention) is "action to avoid illness/disease" (p. 36). On the other hand, Leavell and Clark's (1965) initial conceptualization of levels of prevention considered health promotion as one aspect of primary prevention and not necessarily disease specific. In contrast, the *Ottawa Charter* views health promotion as the overarching concept, defined as "the process of enabling people to increase control over, and improve, their health" (WHO, 1986). The following more comprehensive definition was offered by Nutbeam (1998):

Health promotion represents a comprehensive social and political process, it not only embraces actions directed at strengthening the skills and capabilities of individuals, but also action directed towards changing social, environmental and economic conditions so as to alleviate their impact on public and individual health. Health promotion is the process of enabling people to increase control over the determinants of health and thereby improve their health. Participation is essential to sustain health promotion action. (p. 351)

Three levels of disease prevention correspond to the natural history of disease:

- *Primary prevention* activities protect against a disease before signs and symptoms occur (prepathogenesis stage of disease). Examples include immunization (to prevent infectious diseases) and reduction of risk factors (such as inactivity, smoking, and exposure to air pollution).
- *Secondary prevention* activities promote early detection of disease once pathogenesis has occurred, so that prompt treatment can be initiated to halt disease and limit disability. Examples include preventive screening for cancer (e.g., mammography, testicular self-examination); blood pressure screening to detect hypertension; and blood glucose screening to detect diabetes.
- *Tertiary prevention* activities are initiated in the convalescence stage of disease and are directed toward minimizing residual disability and helping people to live productively with limitations. An example is a cardiac rehabilitation program after a myocardial infarction.

Nursing strategies guided by a prevention framework focus on assessment and alleviation of risk factors for disease. On the other hand, health promotion may be viewed more broadly than disease prevention inasmuch as it emphasizes participation, empowerment, and equity and goes beyond individual health education to a broader ecological approach that incorporates community development and policy advocacy. Health promotion strategies, therefore, are often political because they emphasize addressing structural and systemic inequities and have a strong philosophy of social justice. Health promotion is guided by the following principles (CPHA, 1996):

- Health promotion addresses health issues in context.
- Health promotion supports a holistic approach.
- Health promotion requires a long-term perspective.
- Health promotion is multisectoral.
- Health promotion draws on knowledge from social, economic, political, environmental, medical, and nursing sciences, as well as from first-hand experiences.

Health Promotion Strategies

The *Ottawa Charter* identified five broad strategies to enhance health. The following is a brief introduction to each of these **health promotion strategies**. For further examples of each of these strategies see Reutter and Kushner (2010a).

1. Build Healthy Public Policy. Advocating healthy public policies is a priority strategy for health promotion in Canada. Indeed, some academics have suggested that this strategy is the foundation of all others because policies shape how money, power, and material resources are distributed to society (CPHA, 1996). Advocating healthy public policy means focusing on policies that create healthy living conditions. Because the determinants of health are broad, healthy public policy necessarily extends beyond traditional health agencies and government health departments to other sectors such as agriculture, education, transportation, labour, social services, energy, and housing. Therefore, policymakers in all government sectors and organizations should ensure that their policies have positive health consequences. This emphasis is reflected in national and international documents, including the recent *Adelaide Statement on Health in All Policies* (WHO, 2010). Advocating healthy public policy is best addressed through intersectoral collaboration. As a nurse, you might work with others to develop policy options, encourage public

BOX 1-1 NURSING STORY

Cathy Crowe: Advocating Healthy Public Policy

Cathy Crowe is a Toronto street nurse who has advocated for policies related to a variety of social determinants. Her work as an outreach street nurse in Toronto since the 1980s exemplifies nursing's role not only in attending to immediate health needs of people who are homeless but also advocating for policies that will provide more adequate and affordable housing to alleviate the root causes of these health problems. Crowe co-founded the Toronto Disaster Relief Committee (TDRC) in 1998, which declared homelessness a national disaster in Canada. The committee advocated a "1% solution," calling on the federal, provincial, and territorial governments to allocate an additional 1% of their budget to fully fund a national affordable housing program. The efforts of the TDRC increased awareness, both in large cities in Canada and at the United Nations, of Canada's housing problem. This awareness led to the appointment of a federal minister responsible for homelessness and federal emergency relief monies (e.g., for shelter beds, food banks, programs for homeless youth). Although monies were also made available to provide housing, the goal of a fully funded national housing strategy has not yet been realized, and homelessness continues to increase across Canada.

Crowe has fostered numerous coalitions and advocacy initiatives, working with homeless people and other organizations. The TDRC was involved in fighting the evictions of Toronto's Tent City in 2002 and succeeded in eventually securing housing for many residents. Crowe is currently on the board of directors of a nonprofit organization that is building affordable housing in Toronto. To raise awareness about children who are homeless, she co-produced the film *Home Safe*, set in several Canadian cities. As part of this initiative, a children's forum on homelessness was organized to provide children the opportunity to voice their concerns to the United Nations Special Rapporteur on Adequate Housing when he visited Canada. Crowe has also written a book, *Dying for a Home*, co-authored with activists who are homeless themselves.

Crowe has received numerous awards for her advocacy work. She sees advocacy as a critical nursing role and responsibility. You are encouraged to view her many speeches and activities on her Web site at <http://cathycrowe.ca>.

dialogue, persuade decision makers to adopt the healthiest option, and follow up to make sure the policy is implemented (CPHA, 1996). Cathy Crowe, a Toronto "street nurse," is an excellent example of a nurse who advocates for healthy public policy to reduce homelessness (Box 1-1).

Increasingly, policy advocacy is incorporated into nursing role statements (e.g., Canadian Public Health Association, 2010; International Council of Nurses, 2001) and nursing education curricula (Rains & Barton-Kriese, 2001; Reutter & Duncan, 2002; Reutter and Kushner, 2010b; Reutter & Williamson, 2000). In your nursing care, it is important to think about what policies have contributed to the health situations of your patients, what policies would help alleviate health problems, and how you can champion public policies. For example, how do current welfare incomes, which are lower than poverty "lines" (low-income cut-offs), influence recipients' abilities to obtain adequate food and shelter and participate meaningfully in Canadian society? An informative resource on policy implications arising from social determinants of health is *Social Determinants of Health: The Canadian Facts* (see website at the end of the chapter). Reutter and Kushner (2010b) provide suggestions

for the nursing role in policy advocacy, while Cohen and Reutter (2007) outline ways that nurses can engage in policy advocacy specifically related to child and family poverty.

2. Create Supportive Environments. The *Ottawa Charter* (WHO, 1986) states that “the overall guiding principle . . . is the need to encourage reciprocal maintenance, to take care of each other, our communities and our natural environment” (p. 2). This strategy helps ensure that physical environments are healthy and safe and that living and working conditions are stimulating and satisfying. Creating supportive environments also means protecting the natural environment and conserving natural resources (WHO, 1986).

An excellent example of an initiative that helps create supportive environments is the Comprehensive School Health Initiative, which focuses on improving school environments by providing health instruction, social support, support services, and positive physical environments (Mitchell & Laforet-Fliesser, 2003). Other examples of supportive environments include flexible workplace policies, quality child care programs that support early child development and parental employment, and baby- and senior-friendly community initiatives.

3. Strengthen Community Action. Strengthening communities is a requisite for successful health promotion and for community health nursing practices in Canada (Canadian Public Health Association, 2010). In this strategy, often referred to as *community development*, communities identify issues and work together to make changes that will enhance health. In a community development approach, health providers help community groups identify important issues and organize and implement plans and strategies to resolve these issues, often partnering with other community organizations (see Chapter 4). Public participation in all phases of community programming is key to community development. Examples of community development projects are community gardens and collective kitchens targeted to enhancing food security.

4. Develop Personal Skills. This strategy, which is probably most familiar to nurses, helps clients develop

personal skills, enhance coping strategies, and gain control over their health and environments so that they can make healthy lifestyle choices. Personal skills development includes health education, but it also emphasizes adequate support and resources. Some examples of interventions to enhance personal skills include early intervention programs for children, home visiting by public health nurses, parenting classes, and falls reduction programs for seniors. On a broader level, examples include province-wide health communication initiatives aimed at improving nutrition and physical activity (e.g., *Healthy U* [Alberta], *Act Now* [B.C.]).

5. Reorient Health Services. Health system reform has two objectives: to shift emphasis from treating disease to improving health and to make the health care system more efficient and effective (CPHA, 1996). A proactive approach to health requires improved access to primary health care services, increased community development, improved community-based care services, increased family-based care, and public participation. In Canada, there is considerable emphasis on developing the primary health care model, which nursing associations have advocated for many years (Reutter & Ogilvie, 2011; see also Chapters 2 and 4). Several Canadian documents have reiterated the urgency for the health sector to reorient its focus beyond provision of health care to reducing health inequities through action on the social determinants of health (e.g., Health Council of Canada, 2010; Health Disparities Task Group, 2005).

Population Health Promotion Model: Putting It All Together

This chapter has presented two major approaches to health: health promotion and population health. Hamilton and Bhatti (1996) integrated these two concepts into one model that shows their relationship to each other (Figure 1-5). Aimed at developing actions to improve health, the model explores four major questions: “On *what* can we take action?”; “*How* can we

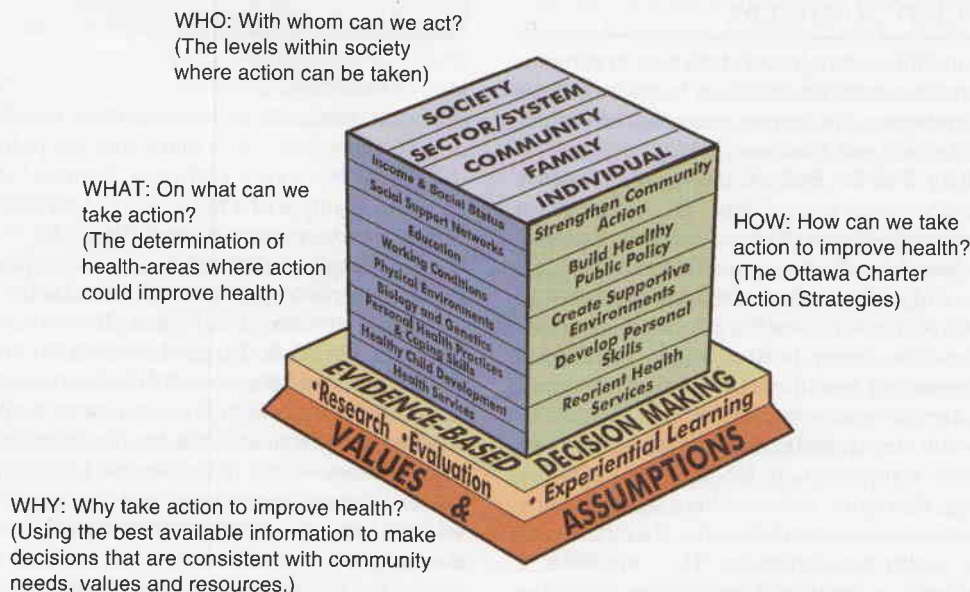


Figure 1-5 Population health promotion model. **Source:** From Hamilton, N., & Bhatti, T. (1996). *Population health promotion: An integrated model of population health and health promotion*. Ottawa: Health Promotion Development Division, Health Canada. Copyright © 1996 by Minister of Public Works and Government Services Canada.

take action?"; "With *whom* can we act?"; and "Why take action?" (Saskatchewan Health, Population Health Branch, 2002).

The document *Strategies for Population Health* (Federal, Provincial, and Territorial ACPH, 1994) indicates health determinants actions that could be taken (the "what"). The *Ottawa Charter* provides a comprehensive set of five strategies to enhance health (the "how"). Together, these documents suggest that to enhance population health, action must be taken on a variety of levels (the "who"). Clearly, nurses must direct these strategies toward individuals and families, communities, individual sectors of society (such as health or environmental sectors), and society as a whole. For example, to promote the health of lower-income clients, you can help them access resources and supports that will enhance their personal skills. Community programs such as school lunch programs, recreational activities, collective kitchens, and support groups can be provided. You can lobby government sectors responsible for housing and employment to implement healthy public policies pertaining to affordable housing, job creation, child care, income security, and financially accessible health services. On a societal level, nurses can raise awareness about the negative effects of poverty on health and well-being and can advocate for policies that will decrease poverty. The population health promotion model shows how evidence-informed decision making is a foundation to ensure that policies and programs focus on the right issues, take effective action, and produce successful results (Hamilton & Bhatti, 1996), the "why" of action (Saskatchewan Health, Population Health Branch, 2002). Evidence is informed by research, experiential learning, and evaluation of programs, policies, and projects. Values and assumptions that are the foundation of the model include the following:

- Stakeholders representing the various determinants must collaborate to address health determinants.
- Society is responsible for its members' health status.
- Health status is a result of people's health practices and their social and physical environments.
- Opportunities for healthy living are based on social justice, equity, and relationships of mutual trust and caring, rather than on power and status.
- Health care, health protection, and disease prevention complement health promotion.
- Active participation in policies and programs is essential.

Summary

This chapter has introduced you to different ways of viewing health and health determinants, including the historical development of these concepts within the Canadian context. The content of the chapter challenges you to approach health situations broadly by identifying the myriad determinants that influence health. An increased understanding of health determinants should enable you to provide more sensitive care at the individual level and to consider strategies at the community and policy levels that will address the root causes of health situations.

❖ KEY CONCEPTS

- Health conceptualizations and determinants influence the nature and scope of professional practice.
- Definitions of health can be classified in several ways; recent definitions reflect a multidimensional perspective and a positive orientation.

- Three recent approaches to health are medical, behavioural, and socioenvironmental.
- Behavioural approaches focus primarily on health practices.
- Socioenvironmental approaches emphasize psychosocial factors and socioenvironmental conditions.
- Health determinants are interrelated.
- Canada is a leader in ever-changing views of health and health determinants.
- Health promotion differs from disease prevention.
- Three levels of disease prevention are primary (protection against disease), secondary (activities that promote early detection), and tertiary (activities directed toward minimizing disability from disease and helping clients learn to live productively with their limitations).
- The *Ottawa Charter* identifies five major categories of health promotion strategies: building healthy public policies; creating supportive environments; strengthening community action; developing personal skills; and reorienting health care services.

❖ CRITICAL THINKING EXERCISES

1. Describe your current level of health. What criteria did you use? Which definition of health discussed in this chapter best matches your understanding of health? Consider another definition of health discussed in this chapter. Does your current level of health change on the basis of this definition? How might your nursing practice differ depending on which conceptualization of health you choose to guide your practice? How might your definition of health change as you experience different life transitions (e.g., aging, parenthood)?
2. What do you consider to be the three most important health problems facing Canadians today? What are the major determinants of these problems? Which health promotion strategies would you consider the most appropriate to address them?
3. Imagine you are a community health nurse working in an area where many low-income women smoke. In a socioenvironmental approach to health, what questions would you need to address to decrease smoking behaviour in your area? How would your approach differ if you were using a behavioural approach to health?

❖ REVIEW QUESTIONS

1. The *Lalonde Report* is significant in that it was the first to emphasize
 1. A behavioural approach to health
 2. A medical approach to health
 3. A socioenvironmental approach to health
 4. Physiological risk factors
2. The "watershed" document that marked the shift from a life-style to a socioenvironmental approach to health was the
 1. Lalonde Report
 2. Adelaide Statement on Health in All Policies
 3. Toronto Charter
 4. Ottawa Charter
3. From a socioenvironmental perspective, the major determinants of health are
 1. Psychosocial risk factors and socioenvironmental risk conditions
 2. Physiological risk factors and behavioural risk factors
 3. Behavioural and psychosocial risk factors
 4. Behavioural and socioenvironmental risk factors

4. The main reason that intersectoral collaboration is a necessary strategy to reach the goal of "Health for All" is
 1. The determinants of health are broad
 2. Intersectoral collaboration is cost-effective
 3. Intersectoral collaboration encourages problem solving at a local level
 4. Intersectoral collaboration is less likely to result in conflict
5. Providing immunizations against measles is an example of
 1. Health promotion
 2. Primary prevention
 3. Secondary prevention
 4. Tertiary prevention
6. Which one of the following statements does *not* accurately characterize health promotion?
 1. Health promotion addresses health issues within the context of the social, economic, and political environment.
 2. Health promotion emphasizes empowerment.
 3. Health promotion strategies focus primarily on helping people develop healthy behaviours.
 4. Health promotion is political.
7. The belief that health is primarily an individual responsibility is most congruent with the _____ approach to health.
 1. Medical
 2. Behavioural
 3. Socioenvironmental
 4. Critical/structural
8. All of the following statements accurately describe the Population Health Promotion Model *except*
 1. The model suggests that action can address the full range of health determinants
 2. The model incorporates the health promotion strategies of the *Ottawa Charter*
 3. The model focuses primarily on interventions at the societal level
 4. The model attempts to integrate population health and health promotion concepts
9. Which of the following is the most influential health determinant?
 1. Personal health practices
 2. Income and social status
 3. Health care services
 4. Physical environment

10. Health promotion activities are aimed at
 1. Providing protection against disease
 2. Increasing the level of well-being
 3. Avoiding injury or illness
 4. Teaching clients to learn to live with their limitations

✦ RECOMMENDED WEB SITES

Canadian Institute for Health Information (CIHI): http://secure.cihi.ca/cihiweb/dispPage.jsp?cw_page=home_e

The CIHI is a not-for-profit Canadian organization working to improve the health of Canadians and the health care system. One of its goals is to generate public awareness about factors affecting good health. This Web site offers current information and numerous links to government health reports.

Public Health Agency of Canada: <http://www.phac-aspc.gc.ca>
The Web site of the Public Health Agency of Canada provides excellent information on many aspects of public health, including the population health approach and the determinants of health.

World Health Organization publications: <http://www.who.int/pub/en/>

This Web site provides links to the publications of the World Health Organization, including the *World Health Report*.

WHO Commission on Social Determinants of Health: http://www.who.int/social_determinants/en/

This Web page provides many excellent papers pertaining to several determinants of health and provides a global perspective.

Social Determinants of Health: The Canadian Facts: http://www.thecanadianfacts.org/The_Canadian_Facts.pdf

This document summarizes the social determinants of health in the Canadian context and includes policy implications, references, and resources.

Fact Sheets: Determinants of Health: http://www.cna-aiic.ca/CNA/issues/fact/determinants/default_e.aspx

This CNA Web site summarizes evidence on the determinants of health in the Canadian context.

Review Question Answers

1. 1, 2, 4, 3, 1, 4, 1, 5, 2, 6, 3, 7, 2, 8, 3, 9, 2, 10, 2

Rationales for the Review Questions appear at the end of the book.

The Canadian Health Care Delivery System

Written by Pammla Lusenga Petrucka, RN, PhD

objectives

Mastery of content in this chapter will enable you to:

- Define the key terms.
- Discuss the evolution of Canada's social safety net and Medicare.
- Identify and define the principles of the *Canada Health Act* and significant legislations related to the Canadian health care system.
- Discuss principal factors influencing health care reform and the current health care delivery system.
- Discuss patients' rights to health care.
- Discuss multiple roles and challenges for all categories of regulated nurses in different health care settings.
- Describe five levels of health care and associated types of services.
- Identify various settings and models of care delivery in the Canadian health care delivery system.
- Identify initiatives related to enhancing quality of the Canadian health care delivery system.

key terms

- | | |
|---------------------------------------|------------------------------------|
| Accessibility, p. 17 | Palliative care, p. 26 |
| Acute care, p. 23 | Parish nursing, p. 25 |
| Adult day support programs, p. 25 | Portability, p. 17 |
| Assisted-living facilities, p. 24 | Primary care (PC), p. 21 |
| Comprehensiveness, p. 17 | Primary health care (PHC), p. 18 |
| Continuity of care, p. 21 | Public administration, p. 17 |
| e-health, p. 26 | Quality care, p. 26 |
| Electronic health record (EHR), p. 26 | Regional health authorities, p. 19 |
| Evidence-informed practice, p. 26 | Rehabilitation, p. 19 |
| Health promotion, p. 25 | Rehabilitation centre, p. 24 |
| Home care, p. 24 | Remote monitoring, p. 26 |
| Hospice, p. 25 | Respite care, p. 26 |
| Inpatients, p. 17 | Secondary care, p. 22 |
| Insured residents, p. 17 | Self-care, p. 26 |
| Levels of health care, p. 25 | Social safety net, p. 16 |
| Medicare, p. 16 | Supportive care, p. 26 |
| m-health, p. 26 | Sustainability, p. 17 |
| Nursing informatics, p. 26 | Tertiary care, p. 22 |
| Outpatients, p. 23 | Universality, p. 17 |
| | Voluntary agencies, p. 25 |

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Nurses are an essential part of the Canadian health care delivery system, constituting the largest group of human health resources and recognized as invaluable to the health of Canadians. Nursing services are necessary for virtually every patient seeking care. In 2009, there were 284,690 registered nurses (RNs), including 2048 nurse practitioners (NPs), in Canada (76.4% of the regulated nursing workforce), 85,277 (22.1 %) licensed practical nurses (LPNs), and 5321 (1.5%) registered psychiatric nurses (RPNs), reflecting an overall increase of 1.3% since 2005 (Canadian Institute for Health Information [CIHI], 2010a; Canadian Nurses Association [CNA], 2011) (Box 2-1).

Since the late 1990s, the Canadian nursing workforce size has remained relatively stable. Canada has 88.2 regulated nurses per 10,000 population, compared to 100.3 in the United Kingdom and 105.0 in the United States (CIHI, 2010a). *Building the Future* (2006) was the first national

► BOX 2-1 Facts About Nursing in Canada, 2009

- For RNs, 62.6% practised in the hospital sector; 9.9%, in long-term care; 14.2%, in community and home care; and 13.3%, in other settings.
- For LPNs, 45.6% practised in hospitals; 7.8% in the community; and 39.8% in long-term care.
- For RNs, 36.7% were degree-prepared; 23.7% were baccalaureate prepared on entry to practice.
- Foreign-graduate representation in the regulated nursing work force included 8.3% of the RNs; 2.3% of LPNs; 7.8% of RPNs.
- 15,603 RNs obtained certification through the CNA program in one of eighteen specialty areas.
- In 2008, the ratio of regulated nurses employed in Canada was one RN for every 127 persons and one LPN for every 439 persons.
- The ratio of NPs employed in Canada was one NP for every 16,945 persons.
- By gender, for RNs and NPs, 94% were female and 6% were male; for LPNs, 93% were female and 7% were male.
- Average age of RNs was 45.1; of LPNs was 43.4; and of RPNs was 47.6.
- For RNs, 23.3% were aged 55 years or older; 9.7% were aged 60 years or older; and 2.3% were aged 65 years or older. For LPNs, 26.7% were aged 55 or older; 8% were aged 60 or older.

Sources: Canadian Institute for Health Information. (2010). *Regulated nurses: Canadian trends, 2005 to 2009*. Ottawa: Author; Canadian Nurses Association. (2010). *RN workforce profiles by areas of responsibility: Year 2008*. Ottawa: Author.

study endorsed by stakeholder groups to outline a long-term strategy to ensure adequate Canadian nursing human resources. Currently, the nursing workforce is challenged by aging workers, high retirement rates, ethical international recruitment, and lack of full-time positions.

Nursing is integral to the health care delivery system, so understanding the system and the issues that affect how care is provided is imperative. As a practising nurse, you must appreciate the complexities of a health care delivery system replete with human and fiscal resource challenges and imperatives for quality services. Financial pressures have forced hospitals and other institutions to shift priorities and to control costs by cutting the workforce and support services. Nurses can help restructure delivery systems and contribute to the achievement of excellence in health care. The success of health care depends on the participation of nurses to create health care systems that deliver quality, cost-effective care. Nurses must lead the way, advocating, reinforcing, and retaining the values of safe, quality, ethical, and evidence-informed patient care.

Evolution of the Canadian Health Care System

Despite significant changes since the 1960s, a network of national, provincial, and territorial social programs, referred to as the **social safety net**, is still needed to protect the most vulnerable members of Canadian society. Most programs are targeted to specific populations (e.g., older adults, children), but a few are universally accessible to all Canadians. For example, provincial social assistance programs provide income support to individuals who are unemployed or underemployed for long periods of time, and the federal Employment

► BOX 2-2 Moments in Canadian Nursing History*

Throughout Canada's history, nurses have been meeting the health care needs of individuals, families, and communities. As nurses encountered changing practice environments, such as world wars or the Great Depression in the 1930s, they transformed their practices and skills to meet the new situations. During English–French hostilities from 1756 to 1760, the Grey Nuns cared for sick and wounded soldiers, including British prisoners of war. This order was known for its excellent hospitals, offering care regardless of race, colour, creed, or financial status. By the middle of the twentieth century, nursing transformed from a predominately spiritual vocation to a secular profession (Mansell, 2004). Most nurses worked in hospitals and communities but were also present in nursing and health care organizations such as the Red Cross, the Victorian Order of Nurses (VON), military or navy service, tuberculosis sanatoria, professional nursing associations, and nursing unions. Although “the practice of nursing is perceived as an integral part of health care services in Canada” (Mansell, 2004, p. 204), the struggle for professionalism and recognition has not been an easy one.

*Section contributor: S. L. Bassendowski, RN, EdD

Insurance program provides income support for those with short-term employment interruption. A key component of Canada's social safety net is the provision of hospital and medical insurance, known as **Medicare**, which is funded by general taxation.

Although referred to as a “national” program, Medicare is, in fact, an interlocking set of 10 provincial and three territorial insurance schemes that provide “prepaid” access to medically necessary hospital and physician services to all citizens and permanent residents (Health Canada, 2010a). Medicare is a source of national pride as a Canadian commitment to the well-being of its citizens, as well as a source of national debate regarding costs, effectiveness, and sustainability. Sustainability considers long-term maintenance and invokes creation of “standards of health human resources, infrastructure, clinical outcomes and fiscal capacity” for the health system (Kondro, 2010). Few issues are as important, controversial, and a source of solidarity for Canadians as health care.

Early Health Care in Canada

Europeans who came to Canada in the fifteenth century brought infectious diseases that flourished under conditions of poor sanitation. Settlements enacted public health laws to control the spread of diseases. For years, government care was limited to essential services (e.g., care of insane persons, epidemics). Permanent boards of health did not exist; families, churches, and local communities were expected to be self-reliant in handling other medical and social problems. The trials, stories, and efforts of these first Canadian nurses were legendary (Box 2-2).

Canada became a self-governing colony with the passage of the *British North America Act* (also known as the *Constitution Act*) in 1867, which united three colonies into the original four provinces of Ontario, Quebec, Nova Scotia, and New Brunswick. This Act accorded certain powers to the national (federal) and provincial governments. Responsibility for health, education, and social services was accorded to the provinces; the federal government retained jurisdiction for parts of these



Figure 2-1 Military nurses. **Source:** Photo courtesy of WJR Bateman.

public policies (Storch, 2006). Health care for Canada's Aboriginal peoples and pharmaceutical safety remain federal responsibilities, but regulation of hospitals is a provincial jurisdiction.

As Canada's population grew and became more urban and industrial, crowded living conditions, poor housing, and poor sanitation led to more disease. Provinces enacted public health acts to establish local boards of health to hire medical health officers and sanitation inspectors. The nurses working directly in the community and with the poor were the first public health nurses.

By 1920, health and social programs had expanded, and voluntary agencies formed; the latter included the Children's Aid Society (formed in 1891), the Red Cross (in 1896), the Victorian Order of Nurses (in 1897), and the Canadian Mental Health Association (in 1918). Municipalities organized services for the poor and established hospitals. Patients who could not pay depended on charity (Figure 2-1). Fraternal societies (e.g., Knights of Columbus) and unions created trusts that members could access when ill, injured at work, or unemployed. Such programs were precursors of modern employment insurance.

As urbanization continued, rural communities had difficulty attracting and paying physicians. The federal *Municipality Act* of 1916 gave communities the power to levy taxes to pay for physicians. The Great Depression dramatically affected the health care system as many could not pay medical bills, and hospital stays caused financial ruin. As needs increased, it became apparent that many provinces did not have the tax base to fund these services and to ensure parallel services across the country.

These hardships inspired the Canadian provincial governments to create a prepaid medical and hospitalization insurance plan. In 1947, Premier Tommy Douglas of Saskatchewan introduced a public, universal hospital insurance plan, which became the basis of the first major federal initiative for national hospital insurance and led to the *Hospital Insurance and Diagnostic Services Act (HIDSA)* of 1957. For provinces establishing universal hospital insurance, *HIDSA* provided federal funds to cover approximately half of service costs. By 1961, all provinces and territories were providing coverage for **inpatient** hospital care.

To ensure medical services outside of hospitals, Saskatchewan again took the lead. With federal government funding for half of the hospital insurance, Saskatchewan could afford to provide medical insurance and, in 1962, passed the *Medical Care Insurance Act*. The legislation was opposed by the province's physicians, who went on a 23-day strike, after which they reached a compromise in which the physicians' autonomy to practise was preserved in exchange for agreeing to a single-payer insurance system to fund their services.

In 1964, the Royal Commission on Health Services (RCHS) was appointed to study the provision of hospital and medical care to all Canadians and concluded that "strong federal government leadership and financial support for medical care" was needed (Wilson, 1995). The *Hall Commission Report*, named after lead commissioner Justice Emmett Hall, called for national expansion of the Saskatchewan model on a cost-shared basis similar to *HIDSA* (RCHS, 1964, 1965).

Based on these recommendations, the federal government passed the *Medical Care Act* of 1966. Federal grants were awarded on a cost-sharing basis with the provinces if programs met certain criteria for coverage of hospital and physician services. Federal, provincial, and territorial governments agreed to share health care expenses equally. By 1972, all provincial and territorial insurance plans extended coverage to include medical services provided outside hospitals. Thus began modern Medicare, as all Canadians had free access to hospital and medical care, regardless of personal wealth.

Although programs prospered, cost sharing did not last. In 1977, the Canadian government enacted the *Federal Provincial Fiscal Arrangements and Established Programs Financing Act* to replace cost sharing with block transfers of funds and a complicated formula of transferring tax points from the federal government to the provinces and territories. These block transfers resulted in decreased federal contributions. To address this shortfall, some provinces allowed extra billing of patients by hospitals and provider groups over the amount that the universal insurance program covered. Medicare's defenders saw these charges as a threat to the universality of Canada's medical insurance scheme and in violation of the principle that care should be accessible on the basis of need and not on ability to pay.

The federal government's response was to enact the *Canada Health Act* in 1984, which amalgamated the previous acts of *HIDSA* and *Medical Care Act* and effectively banned extra billing and user fees. The *Canada Health Act* added the principle of **accessibility** to the principles of **public administration**, **comprehensiveness**, **universality**, and **portability** (Table 2-1). Recently, a sixth principle—**sustainability**—has been debated. These principles apply to all **insured residents** (i.e., eligible residents), but exclude members of the Canadian Forces, Royal Canadian Mounted Police (RCMP), veterans, and inmates of federal penitentiaries. First Nations and Inuit health services receive special considerations, discussed later in this chapter. Under previous Acts, access to services was through physician gatekeepers, but this revision to the *Canada Health Act* allowed multiple points of access and insurance through additional care providers. Despite opposition, all provinces and territories were following *Canada Health Act* principles by 1987 in pursuit of its primary objective "to protect, promote and restore the physical and mental well-being of residents of Canada and to facilitate reasonable access to health services without financial or other barriers" (Health Canada, 1992, 2010b).

► TABLE 2-1

Principles of the Canada Health Act of 1984

Public administration	A public authority administers and operates the plan on a nonprofit basis; responsible to the provincial and territorial governments for decision making on benefit levels and services; subject to financial audits.
Comprehensiveness	Covers all medically necessary hospital and physician services; as the province or territory permits, services of other health care practitioners. Palette of publicly funded services for each province and territory varies, which is controversial (Commission on the Future of Health Care in Canada (CFHC) [Romanow, 2002]).
Universality	Insured residents entitled to health care services provided by the plan on uniform terms and conditions. Universality negates discrimination based on race, gender, income, ethnicity, or religion (Romanow, 2002).
Portability	Insured residents can access health care services in another province or territory without cost or penalty. Personal coverage must be maintained when an insured person moves or travels within Canada or travels outside of Canada.
Accessibility	Insured residents have reasonable access to health care facilities and providers; additional charges for insured services are not permitted; essential health care services must be available to all Canadians on the basis of need (Romanow, 2002).

Based on Health Canada. (2010). *Canada's health care system (Canada Health Act)*. Retrieved from http://www.health.gov.bc.ca/library/publications/year/2007/conversation_on_health/PartII/PartII_HealthAct.pdf.

The *Canada Health Act* is a major piece of legislation influencing the delivery of health care services across Canada. Other federal legislation (Table 2-2) influences health and health services for Canadians in areas such as tobacco use, environmental health, and health research.

Aboriginal Health Care

The major legislation is the *Indian Act* of 1985 (see <http://laws.justice.gc.ca/en/I-5/>), which identifies the federal government's role in providing health care services to First Nations and Inuit people. First Nations and Inuit Health, part of Health Canada, and Indian and Northern Affairs Canada share responsibility for ensuring health care services are provided to Canada's First Nations and Inuit people (Health Canada, 2011; Indian and Northern Affairs Canada, 2010a). Treaties with so-called Indian bands in Canada were signed before Confederation with the British government and after Confederation with the Government of Canada (Natural Resources Canada, 2003). These treaties outlined agreements regarding land, services, and relationships; some (such as Treaty 6) included a provision for health care services to be provided to the First Nations communities, often referred to as the "medicine chest" clause (Indian and Northern Affairs Canada, 2010a). These treaties enable direct delivery of services to First Nations and Inuit peoples, regardless of where they live in Canada, including **primary health care (PHC)** and emergency services on remote and isolated reserves where provincial or territorial services are not readily available; community-based health programs both on reserves and in Inuit communities; and non-insured health benefits programs (e.g., pharmaceuticals, dental, vision, and medical transportation). All four levels of government (federal, provincial and territorial, and Aboriginal) are working together to improve and integrate health service delivery, with anticipated allocations for 2011–12 at \$1977.6 million and an 1862-full-time-equivalents workforce (Treasury Board Secretariat, 2009).

Aboriginal self-governance has been enabled through the "inherent right of self-government" under Section 35 of the *Canadian Constitution Act* of 1982. As self-governance models emerge, health care, as part of the services and programs palette within Aboriginal jurisdiction, will challenge health

► TABLE 2-2 **Relevant Health-Related Legislation*****Legislation and Date Passed**

Canadian Environmental Protection Act, 1999
www.ec.gc.ca/lcpe-cepa
 Canadian Institutes of Health Research Act, 2000
<http://www.cihr-irsc.gc.ca/e/22948.html>
 Controlled Drugs and Substances Act, 1996
<http://laws.justice.gc.ca/en/C-38.8/index.html>
 Emergency Preparedness Act, 1988
<http://laws.justice.gc.ca/en/E-4.6>
 Food and Drugs Act, 1985 <http://laws.justice.gc.ca/en/f-27/>
 Quarantine Act, 2005
<http://laws.justice.gc.ca/en/Q-1.1/index.html>
 Tobacco Act, 1997
<http://laws.justice.gc.ca/en/T-11.5/index.html>

Purpose

Regulates pollution prevention; environmental protection and human health contribute to sustainable development
 Strategizes and funds health-related research through 13 virtual institutes
 Controls certain drugs, their precursors, and related substances
 Develops and implements civil emergency plans; facilitates and coordinates across government levels and institutions, foreign governments, and international organizations
 Regulates food, drugs, cosmetics, and therapeutic devices
 Controls introduction and spread of infectious or contagious diseases
 Regulates manufacture, sale, labelling, and promotion of tobacco products

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care professionals to be “responsive to [Aboriginal] political, economic, legal, historical, cultural and social circumstances” (Indian and Northern Affairs Canada, 2010b).

Organization and Governance of Health Care

Under the *Canadian Constitution Act*, administration and delivery of health care services are primarily provincial or territorial responsibilities. The federal government has a role in health care financing, enforcement of the *Canada Health Act*, delivery of services to previously described targeted groups, and setting national agendas such as those relating to public health and safety, pharmaceuticals, and biomedical and health services research.

Federal Jurisdiction

The federal government is charged to do the following:

- Set and administer *Canada Health Act* principles for the health care system
- Assist in financing provincial and territorial health care services through transfer payments (i.e., transferring tax money to share cost) in alignment with *Canada Health Act* principles
- Deliver or co-deliver health services for targeted groups, as described previously
- Provide national policy and programming to promote health and prevent disease, such as healthy environment, consumer safety, and public health programs

Provincial and Territorial Jurisdiction

Each provincial and territorial government is charged to do the following:

- Develop and administer its own health care insurance plan
- Manage, finance, and plan insurable health care services and delivery, complying with *Canada Health Act* principles (Table 2-1)
- Determine organization and location of health care facilities, mix of health care providers employed in these facilities, and money allocations for health care services
- Reimburse physician and hospital expenses; provide some **rehabilitation** and long-term care services, usually on the basis of co-payments with individual users.

Each provincial and territorial plan is unique; what is covered and by how much varies across the country. For example, coverage for drugs taken outside of hospitals, ambulance services, and home care varies widely by province and territory. Marchildon (2006) reviewed what is and is not covered by each province and territory. To offset costs for services not covered by provincial or territorial insurance, Canadians can buy private health insurance or participate in employer-offered individual or group insurance plans.

Professional Jurisdiction

Most health professions (i.e., medicine, nursing, pharmacology) in Canada are self-regulated, which means they determine standards, competencies, codes of ethics, and disciplinary actions for their respective members. Some professions are regulated through governments (e.g., emergency medical technicians Ontario) or other regulatory mechanisms (e.g., osteopathic physicians in British Columbia). In some cases, so-called omnibus legislations regulate several professions simultaneously (e.g., Alberta's *Health Disciplines Act* of 2000).

Health Care Spending

“Canadians pay, directly or indirectly, for every aspect of our health care system through a combination of taxes, payments to government, private insurance premiums, and direct out-of-pocket fees of varying types and amounts” (Romanow, 2002, p. 24). In 2010, private health care spending represented 14.8% of the total health care costs through out-of-pocket payments (eighth highest among Organization for Economic Cooperation and Development [OECD] countries); another 12.8% was covered by private insurance programs (OECD, 2010). The average Canadian household expended \$2044 on health care (up 4.5% from the previous year), with a total spending per person varying by province, the highest being in Alberta (\$6266) and the lowest in Quebec (\$5096) (CIHI, 2010b).

In 2010, total spending on health care is expected to reach \$191.6 billion (\$135.1 billion government spending, \$56.5 billion private spending); 5.2% more than the previous year, but maintaining approximately a 70–30 split (CIHI, 2010b). Overall, in Canada, \$5614 per person was spent on health care in 2010, in comparison with \$4548 in 2006 (CIHI, 2010b). Furthermore, in 2009, trends showed higher per capita spending for infants (at \$8239) and older adults (ranging from \$5539 [age 65–69] to \$17,469 [over 80]) than for younger adults (cbcnews.ca, November 19, 2009). Although older adults constitute less than 14% of the population, they account for approximately 44% of government health care spending (CIHI, 2010b).

Internationally, in 2008, Canada was ranked fifth (\$4063 US per person) for health care spending compared to the first-ranking United States (\$7538 per person) (CIHI, 2010b).

According to CIHI (2010b), hospital and health care institutions (29%), retail drug sales (16%), and physician services (14%) account for nearly 60% of health care spending. For 2010, estimated health expenditures forecast hospitals at \$55.3 billion, pharmaceuticals at \$31.1 billion, and physician services at \$26.3 billion. Despite these significant expenditures, Canada ranks tenth of 16 OECD countries (Conference Board of Canada, 2009) on quality indicators such as life expectancy, self-reported health status, disease-specific mortality rates, lifestyle behaviours (e.g., smoking, obesity), and mortality due to medical misadventure.

Trends and Reforms in Canada's Health Care System

Since the 1980s, rapid changes in health care delivery, technologies, and public expectations have challenged the Canadian federal, provincial, and territorial governments to reconstruct a health care system that balances current and future political, legal, economic, and social realities (Petrucka, 2005). In most provinces, restructuring has become entrusted to **regional health authorities**, which are led by appointed or elected community representatives and whose mandates, roles, and responsibilities are provincially legislated (Lewis & Kouri, 2004). Regionalization was intended to streamline health services, to reduce fragmentation, to respond to local needs, to improve public participation, and to address the continuum of health care services from disease prevention and health promotion to curative, supportive, restorative, and palliative treatments (Lewis & Kouri, 2004). Although these principles were initially attractive and promising, the process has not lived up to its potential; instead, it has become primarily

a fiscal exercise rather than a philosophical or health-motivated reform (Petrucka, 2005).

According to Armstrong (1999), health reform primarily concerns continuity and integration, quality and accountability, and disease prevention and health promotion. Framed within the determinants of health, reforms are intended to deliver better quality and appropriate care at lower cost by adopting sound business and managerial strategies. Two influential national reports on Canada's health care system reforms are *The Kirby Report* (Kirby, 2002) and Romanow's Commission on the Future of Health Care in Canada (CFHC) (2002) (Box 2-3).

In 2004, the federal government initiated a transfer scheme (i.e., the *10-Year Plan to Strengthen Health Care*) to increase the efficiency and sustainability of the Canadian health care system (CGA-Canada, 2010). This plan, which is contributing to a

dialogue on promising practices and concerns on future directions, expires in 2014.

Because health care costs are rising faster than government revenues, some Canadian citizens and decision makers believe that health care spending will eventually crowd out spending on other programs in the social safety net and consume 100% of all monies (MacKinnon, 2004). If health care spending absorbs all available monies, the future of education programs, social services, transportation safety, and environmental protection—which have a profound impact on health—is uncertain.

The CNA (2009) continues to advocate for a publicly funded, not-for-profit health care system rooted in the principles of the *Canada Health Act* and advancing nursing as a primary access point to health care.

► BOX 2-3 Influential Health Care Reports

The Romanow Commission

Romanow (2002) concluded that Medicare is sustainable and must be preserved because it represents Canadians' core values. He emphasized modernizing the *Canada Health Act* through appropriate funding and the following changes:

- Create a new diagnostic service fund
- Build information technology infrastructure
- Improve access (e.g., in rural and remote areas, for Aboriginal peoples)
- Ensure and measure quality
- Improve and expand PHC
- Strengthen and expand home care
- Offer catastrophic drug coverage
- Create a national health council responsible for indicators and performance measures

Romanow (2002) stressed accountability for funding and services provided.

The Kirby Report

Kirby (2002) concluded that the current Medicare system is not sustainable and advocated for stronger private sector involvement in health care delivery. Although Kirby did not address the core values or recommend changes to the *Canada Health Act*, he clarified the impact of spiralling health care costs on other social programs. Kirby recommended the following:

- Shifting funding for hospitals to a service-based model
- Granting more responsibility to regional health authorities for delivering publicly insured health services, contracting out these services, or both
- Reforming PHC
- Offering a health care guarantee to Canadians (e.g., time limits for wait times; if exceeded, the government pays for care provided elsewhere)

Like Romanow, Kirby (2002) emphasized accountability for funding and services, but instead of a national health council suggested an appointed council with limited advisory functions.

Source: Based on Romanow, R. (2002). *Building on values: The future of health care in Canada—Final report*. Ottawa: CFHC; and Kirby (2002). *The health of Canadians—The federal role*. Vol. 6: Recommendations for reform. Ottawa: Standing Senate Committee on Social Affairs, Science and Technology. Retrieved from <http://www.parl.gc.ca/37/2/parlbus/commbus/senate/com-e/soci-e/rep-e/repoct02vol6-e.htm>.

Role of Nurses in Health Care Policy

Nurses play a key role in health care policy, both as leaders at the political and community levels and in their everyday work lives. Individually and collectively, nurses are integral to policy development (Falk-Raphael, 2005; Hart, 2004). Health care needs a coordinated, integrated approach by nurses if they are to inform policy decisions and help shape the country's health care systems (Villeneuve & MacDonald, 2006). Almost continually since the late 1950s, the position of a senior or chief nurse has existed at the federal government level (in the Federal Office of Nursing Policy), and many provincial governments employ nurses in similar positions. These nurses bring nursing perspectives to health policy decisions, present government perspectives to nurses and patients, and articulate the potential impact of policy decisions to politicians and other stakeholders. For example, the Federal Office of Nursing Policy is charged with health policy and program development across Health Canada through evidence-informed nursing perspectives.

Right to Health Care

The consensus in Canada is that everyone has a right to health care. In general, consumers have a right to determine what kind of health care should be available to them. The *Canadian Charter of Rights and Freedoms* of 1982 does not explicitly include health care as a right; therefore, federal and provincial legislation must prove legal entitlement. (Only Quebec has health care rights in its legislation.) The *Canada Health Act* influences rights by setting conditions for federal health care co-funding, but the right to health care itself is not guaranteed in the Act.

Rights Within the Health Care System

Sutherland and Fulton (1992) articulated rights that Canadian health care workers expect: namely, the right to reasonable working conditions, including safety and absence of discrimination. Professional associations and unions work to establish and protect the rights of health care workers. Romanow (2002) called for the adoption of a health covenant that would specify the rights, obligations, and expectations of governments, citizens, and health care professionals. According to the Canadian Healthcare Association (CHA) (2010), no national or provincial patient charters of rights exist; however, the Consumers' Association of Canada and the Ontario Hospital Association have advanced such documents. Ontario's Assistant Deputy Minister of Health and Long-term Care stated that "creation of a patient-centred charter for quality in health care would provide

clarity on what needs to be fixed about Canada's health care system" (Collier, 2010). Saskatchewan's independent *Patient First Review* resulted in a key recommendation to "make patient- and family-centred care the foundation and principal aim of the Saskatchewan health system . . . as an overarching guide for health care organizations, professional groups and others to make the Patient First philosophy a reality in all work places" (Dagnone, 2009).

Although, in practice, no statutory requirement exists in Canada to include patient advocacy groups in the policymaking process, a number of national groups (e.g., Canadian Cancer Society), as well as disease-specific patient groups, are involved. These groups share information, endorse, report on, or criticize health care policy decisions (Health Consumer Powerhouse AB & Frontier Centre for Public Policy, 2008).

Primary Health Care

Primary health care (PHC) is a foundation of Canada's health care system, providing an entry point of contact into the health care system, as well as the vehicle for **continuity of care** (Health Council of Canada [HCC], 2008). (See Chapter 17 for more on continuity of care.) Health systems based on PHC are more effective and efficient than those centred on specialty and tertiary care (Starfield et al., 2005). Rooted in a 1974 document by then-Minister of Health and Welfare, Marc Lalonde, PHC was envisioned as addressing nonmedical determinants of health to improve health (HCC, 2005). The report outlined the connection between health status and social determinants of health, including employment, poverty, lifestyle, environment, and genetic endowment. Other documents, such as the *Alma-Ata Declaration on PHC* (World Health Organization [WHO], 1978) and the *Ottawa Charter for Health Promotion* (Charter) (Lalonde, 1986), built the framework that has informed population health and health promotion approaches globally. The Canadian federal, provincial, and territorial health departments have established units or branches that focus on, promote, and fund PHC-based programs and services.

PHC is a philosophy and model for improving health that supports essential health care services, with a strong emphasis on the principles of health promotion and disease prevention. Most definitions of PHC recognize the importance of emphasizing the determinants of health and strategies to advance individual and population health (HCC, 2008).

PHC, as an integrated approach, builds a related spectrum of programs and services external to the traditional health care system. This palette embodies health in its broadest sense, such as income, housing, education, and environment (Health Canada, 2006). The PHC model (Figure 2-2) focuses on collaboration among health professionals, community members, and others working intersectorally, emphasizing health promotion, development of health policies, and prevention of diseases for all. According to the National Primary Health Care Awareness Strategy (NPHCAS) (2006b), PHC does the following:

- Prevents people from becoming ill or injured
- Enables self-care
- Optimizes health care provider expertise
- Enables health care workers to treat acute and episodic illness
- Coordinates for efficiency and access
- Enables individuals to participate fully in their health care
- Recognizes factors external to the health care system that affect individual and community health

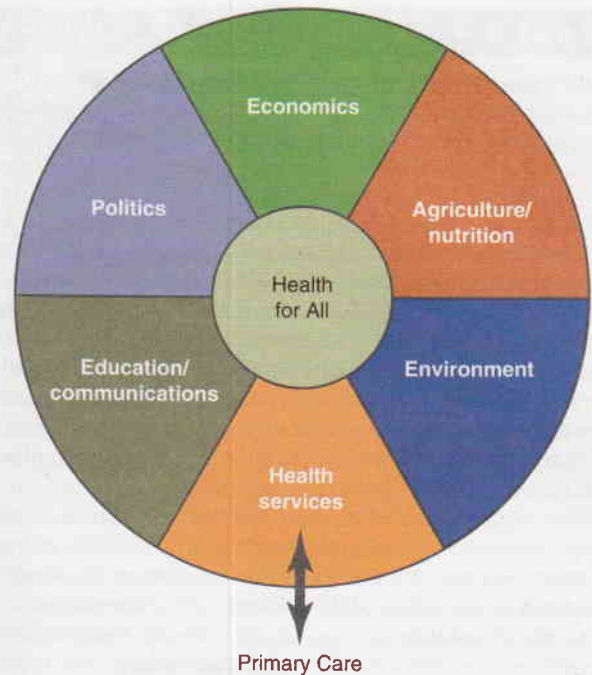


Figure 2-2 Primary health care model: A multisectoral or intersectoral approach. **Source:** From Shoulz, J., & Hatcher, P. A. (1997). Looking beyond primary health care: An approach to community-based action. *Nursing Outlook*, 45(1), 24. © 1996 by P. Hatcher, J. Shoulz, and W. Patrick.

Throughout this book, "Focus on Primary Health Care" boxes highlight the vital role that nurses play in providing PHC. Box 2-4 links health care situations to PHC principles.

Barriers to Primary Health Care

The meaning of PHC has caused confusion among health care consumers and even health care providers. The distinction between PHC and **primary care (PC)** is difficult to understand. PC focuses on personal health services, whereas PHC extends beyond PC to include health education, nutrition, maternal and child health care, family planning, immunizations, and control of locally endemic diseases. This broader concept of PHC proposed for Canada relates to the continuum of care by interprofessional teams of providers working with the patient as the driver (Annapolis Valley Health, 2007). Some professionals do not support a PHC model, which requires interdisciplinary collaboration and flexible boundaries between health care professions. In response, Health Canada (2010c) introduced the Interprofessional Education for Collaborative Patient-Centred Practice strategy, providing opportunities across Canada for improving socialization, decision making, respect, understanding, and competencies related to enhancing collaborative practice, which potentially yields greater provider satisfaction, enhanced recruitment and retention, and improved patient safety and outcomes.

Challenging the adoption of PHC is an underlying concern as "many Canadians see the health system as an 'illness care' system that will be there when they need it" (CNA, 2003). Some experts fear that if monies are dedicated to PHC priorities and implementation, benefits will be limited, at least in the near term. PHC is a sensible approach to health care that is cost-effective and benefits most people. For example, by

BOX 2-4 FOCUS ON PRIMARY HEALTH CARE

The Four Pillars of Primary Health Care*

A number of models for PHC exist, such as the NPHCAS (2006a) model, describing four pillars of PHC as teams, access, information, and healthy living.

Teams

PHC functions with team-based care, which improves access and coordination, reduces waiting times, and enhances comprehensiveness of care (Barrett, Curran, Glynn, & Godwin, 2007). A good team works together to solve or explore common issues, with the best possible participation of the patient (HCC, 2009). Despite knowledge that effective PHC represents a promising path to improving the comprehensiveness of health care, there has been minimal progress in the formation of such teams (e.g., by March 2009, 31% of Saskatchewan's population was served by PHC teams) (Dagnone, 2009).

West Winds Primary Health Centre (WWPHC) in Saskatoon is a PHC centre addressing the health care needs of men, pregnant and non-pregnant women, adolescents, children, newcomers, Aboriginal peoples, and older adults. WWPHC functions in partnership with the University of Saskatchewan and Saskatoon Health Region to deliver community-based PHC and offer innovative research and program evaluation opportunities for health disciplines students.

Through transdisciplinary and intersectoral collaboration, WWPHC provides a full range of services that include but are not limited to health promotion, chronic disease prevention and management (i.e., diabetes education), mental health (including maternal) and addiction services, public health, foundational programs (Healthy Mother-Healthy Baby, Food for Thought), and dental clinics. The staff includes physicians, nutritionists, psychologists, nurses, NPs, therapists (i.e., occupational, physio), speech-language pathologists, pharmacists, social workers, and clinical researchers. A community participation working group and a collaborative practice resource group provide direction and support development of evidence-informed programs.

Access

In 2007, 16.7% of Canadians had difficulties in accessing routine or ongoing health care (CIHI, 2009a). PHC strives to ensure better access to appropriate services when and where they are needed by expediting entry into the health care system, maximizing scopes of practice for health professionals, and reducing demands for care by keeping clients healthier (Rachlis, 2005).

In urban settings, interprofessional teams work to bring PHC to the streets. They work with vulnerable groups—those in poor health (often with addictions, HIV/AIDS, hepatitis C), homeless, malnourished and/or lacking support—to assess and monitor health status and provide care “in place.” Nurses on “PHC street teams” care for individuals and

communities in need; for example, one nurse visits a 17-year-old prostitute who is 8 months pregnant, is addicted to crack, and lives within a boxcar community. He runs a community program called “Having Healthy Babies” for young, vulnerable women, co-located at a centre near the train tracks, thereby increasing accessibility. Also, he advocates for a “chili lunch” program through local church and business communities for “on-the-street” youth.

Information

In 2007, 17.1% of people reported difficulty in accessing health information on a continuous basis (CIHI, 2009a). Using technology to improve efficiency and quality is a critical part of health care renewal (HCC, 2008). Tools (e.g., electronic health record [EHR], diagnostic equipment) and skills (e.g., telehealth) facilitate quality, access, and coordination of information. One technology is telephone triage, which is used successfully in many jurisdictions; individuals dial a toll-free number to connect with a qualified nurse who can answer health questions. This technology addresses access to health care, especially in rural and remote areas. In 2009, Nova Scotia introduced HealthLink 811, with 29 RNs managing over 100,000 calls, resulting in over 40% of the callers being guided through self-care, rather than entering the health system (CBC News, August 3, 2010). Canada Health Infoway (CHI) is a federally funded, independent, not-for-profit organization with representation from 14 federal, provincial, and territorial health ministries. CHI fosters and accelerates the development and adoption of electronic health (e-health) information systems on a pan-Canadian level. CHI envisions a high-quality, sustainable, and effective info-structure to provide Canadians and health professionals with timely, appropriate, and secure access to information across the health care system, such as supporting triage nurses to monitor patient kiosks at the Scarborough Hospital (CHI, 2011).

Healthy Living

PHC embraces strategies of prevention, chronic illness management, and self-care, while recognizing that factors outside the health care system (e.g., social, economic, environmental) influence individual and community health.

An example is of a public health nurse in southern Ontario running a program that educated low-income mothers about nutrition, child development, and community action. The women shared strategies to meet their families' nutritional requirements on tight budgets. Upon learning that a national bakery was closing its local day-old-bread outlet, the nurse coached the women to call a local newspaper reporter, who, in turn, contacted the bakery's president and persuaded the owner to keep the outlet open. The nurse's health promotion activities resulted in a decision that benefited the community.

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Source: Canadian Nurses Association. (2003). Primary health care—The time has come. *Nursing Now*, 16, 1–4.

attending a community health program on infant and child care, parents learn the importance of recognizing signs and symptoms of urinary tract infection (UTI) in children and the importance of seeking medical treatment. With this knowledge comes prevention of long-term serious complications of untreated UTIs, such as kidney damage, and reduced health care costs.

Other potential barriers include lack of information about technology support, disincentives created by compensation systems, and lack of physician leadership and participation on PHC teams (Dagnone, 2009).

Future of Primary Health Care

Strengthening PHC will meet Canadians' needs for prompt access to comprehensive evidence-informed services (CIHI, 2009b). In a restructured health care system that emphasizes PHC, programs necessarily will cross sectors. For example, trauma programs will have health promotion activities (road safety education), preventive programming (helmet legislation), **secondary care** and **tertiary care** (emergency transportation), and rehabilitation (head injury–related recovery programs). Programs will cover multiple sites, may be defined

BOX 2-5 CASE STUDY

Primary Health Care

During a community meeting in a core area of a small city, parents, educators, health care professionals, and volunteers agreed to pilot an integrated program to reduce obesity in children. Social services staff and volunteers run a breakfast program. Fruits and vegetables for twice-daily snacks are donated by a local grocery store. Nutritionists and kinesiologists educate the teachers to integrate nutrition and physical fitness into the curriculum. Schools commit to having students and teachers participate in activities for at least 30 minutes every day and establish rules for school lunches (e.g., no soda pop). Nurse practitioners arrange visits with the parents of children identified as being overweight or at risk. If only 10% of the children in the program develop a healthier lifestyle, future savings to the health care system will pay for program costs.

by a particular disease or population group (e.g., children), and will comprise multiple disciplines and sectors of society (e.g., health care, education, justice systems). Nursing will have a significant role in every aspect of a PHC-integrated program.

More than three-quarters (76%) of Canadians reported the quality of PHC received in the previous 12 months was either “excellent” or “very good” (CIHI, 2009b).

Because of its integrated approach, PHC may hold the key to Canada’s looming health care crisis. If Canadians stay healthier because more money is spent on PHC, they will need less medical care, and the proportion of money going to medical care will decline. By integrating health care, education, social services, and the voluntary sectors, competition for government monies may decline and each sector will articulate beyond their own boundaries (Box 2-5). To promote the PHC agenda, resources and strategies to be considered are the following (HCC, 2005):

- Adequate, appropriate supply of human health resources
- A team approach focused on patient needs, collectively working to optimize outcomes
- Information technology (i.e., electronic health records)
- Governance and funding models supporting team-based care
- Links to public health
- A culture of accountability, performance measurement, and quality improvement

Settings for Health Care Delivery

Although health care delivery varies across Canada, three types of delivery agencies are comparable: institutional; community and voluntary; and private-sector agencies.

Institutional Sector

Institutional agencies including hospitals, long-term care facilities, psychiatric facilities, and rehabilitation centres offer health care services to inpatients (clients who stay at an institution for diagnosis, treatment, or rehabilitation). Most offer services to **outpatients** (clients who visit an institution for these services).

Hospitals. Hospitals have traditionally been considered major health care agencies, most specializing in **acute care** services. Acute care is health care delivered for a short time (usually days to weeks, typically less than three months) in

which an immediate health problem is diagnosed, treated, or both. Hospital services may include emergency and diagnostic, inpatient, surgical intervention, intensive care, outpatient, and rehabilitation services. The numbers of hospitals, hospital beds, and admissions in Canada have decreased significantly since the 1990s, creating pressures in dealing with the clients who have more acute and specialized needs. In 2007, Canada had 2.7 acute beds per 1000 population, mirroring the United States, but significantly lower than Australia’s 3.5 beds and Japan’s 8.2 beds (OECD, 2009). Hospitals strive to provide the highest quality of care possible with the newest treatments and technologies and to facilitate appropriate, safe, and timely patient discharge to the home, community, or a facility to manage remaining health care needs.

Hospitals are distinguished by their size (e.g., community hospitals), service provision (e.g., cancer care hospitals), and connection to academic institutions (e.g., university health science centres), as well as by public or private status. Public hospitals are financed and operated by a government agency at the local, provincial, or national level and constitute the largest group of health employers in Canada. Private hospitals are owned and operated by groups such as churches, corporations, and charitable organizations. Military hospitals, although limited in Canada, provide medical services to members of the military and their families. Veterans’ hospitals provide residential care, extended care, and rehabilitation to aging, injured, and disabled military veterans.

Roles and functions of hospitals and hospital-based nurses have evolved in this era of health care reform. Hospital nurses use critical thinking skills (see Chapter 11), apply the nursing process (see Chapter 12), coordinate and delegate care elements (see Chapter 10), and stress patient teaching and post-discharge self-care (see Chapter 20). An emerging trend is toward evidence-informed practice when patient interventions are determined. Nurses participate in discharge planning as a critical interdisciplinary coordination strategy in the continuity of care for clients, facilitating smooth and safe transitions of clients between levels of care and the community. Many hospital nurses specialize as clinical nurse specialists, caring for clients with specific needs (e.g., palliative) or specific diseases (e.g., cardiovascular). Other hospital roles include nurse manager, infection control coordinator, clinical educator, and clinical nurse researcher.

Long-Term Care (LTC) Facilities. LTC (extended care) facilities provide accommodations and 24-hour intermediate and custodial care (e.g., nursing, rehabilitation, dietary, recreational, social, and spiritual services) for residents of any age with chronic or debilitating illnesses or disabilities. Most residents are frail, older adults with multiple health issues (see Chapter 24). Some are younger adults with severe, chronic health conditions (see Chapter 23). LTC facilities function as the resident’s temporary or permanent home; therefore, the surroundings are as homelike as possible. The philosophy of care is to provide a planned, systematic, and interdisciplinary approach that helps residents reach and maintain their highest level of function. LTC facilities are not part of the insured services bundle within the *Canada Health Act*, although many provincial and territorial plans do provide some coverage. In these settings, nurses plan and coordinate resident care, manage chronic illnesses, and conduct rehabilitation programs and assume roles in education (see Chapter 20), communication (see Chapter 17), and family-related interventions (see Chapter 19).

Psychiatric Facilities. Located in hospitals, independent outpatient clinics, or mental health clinics, psychiatric facilities offer inpatient and outpatient services. Mental health is often seen as one of the “orphan children of Medicare,” never being fully integrated into the health care system (Romanow, 2002). Nurses in these facilities collaborate with doctors, psychologists, social workers, and therapists to make plans that enable a patient to return to the community. At discharge from inpatient facilities, patients are usually referred for follow-up to community-based agencies. Nurses working in these settings are especially skillful in communication skills (see Chapter 17) and patient safety (see Chapter 36).

Rehabilitation Centres. A rehabilitation centre, a residential institution that provides therapy and restorative training, seeks to decrease clients’ dependence on care. Many centres offer programs to teach the patient, patient’s family, or both to achieve maximum function after a stroke, head or spinal cord injury, or other impairment. Substance rehabilitation centres help clients withdraw from alcohol and drug dependence and return to the community. Nurses in rehabilitation centres collaborate closely with physical and occupational therapists, psychologists, and social workers, working with clients experiencing stress and adaptation (see Chapter 29) and those at risk of challenges to mobility (see Chapter 45) and to safety (see Chapter 36).

Community Sector

Community services are directed at primary and secondary care, described later in this chapter, and should be accessible to clients in locations where they live, work, play, and engage. The focus is on empowerment and community development opportunities that effect change at the broadest social level (Health Canada, 2006). Community health nurses oversee and participate in outreach programs that provide services and locate clients who might not seek care at traditional health care centres. According to the Community Health Nurses of Canada (2011), community nurses work in diverse rural and urban settings such as public health units, home health, family practices, occupational health, outpost stations, the street, faith organizations, schools, and correctional institutions. Nurses practising in the community sector are involved in community-based nursing (see Chapter 4) and caring throughout the lifespan (see Unit V).

Public Health. Public health is committed to ensuring conditions and circumstances in which people can be healthy through appropriate screening, assessment, development, monitoring, and support (i.e., public policy). Whether it concerns environmental, biological, or disease issues, public health differs from many clinical practice settings in its focus on entire populations rather than on individual clients.

Activities related to pandemic planning, severe acute respiratory syndrome (SARS), West Nile virus, H1N1, and global surveillance have put public health in the forefront (see the *Canadian Pandemic Influenza Plan for the Health Sector* [Public Health Agency of Canada, 2009]) with regard to protection and promotion efforts. Public health nurses work closely with a range of health care providers, including medical health officers, therapists, psychologists, nutritionists, and environmental and public health inspectors. Nurses are the primary professionals in public health clinics offering well-baby clinics, school health programs, sexually transmitted infections surveillance, and screening programs, as well as health promotion (e.g., tobacco reduction) and disease prevention programs.

Physician Offices. Physician offices offer PC focusing on diagnosis and treatment of specific illnesses rather than on health promotion. The majority of physicians function as private contractors within the publicly funded health care system, working on a fee-for-service basis. In this setting, nurses record vital signs, prepare clients for examination, and collaborate with physicians to conduct physical examinations, document histories, offer health education, and recommend therapies.

Community Health Centres (CHCs) and Clinics. CHC teams plan, manage, and deliver comprehensive services to designated geographic areas or specific at-risk populations. According to the Canadian Alliance of Community Health Centre Associations (2011), CHCs are the first point of contact offering a range of primary health, social, rehabilitation, and other noninstitutional services and emphasizing prevention, promotion, health education, community development, and partnerships to develop a healthy local community.

Increasingly, NPs and nurses are managing CHCs, with the intention of enabling clients to assume more responsibility for their health. NPs have become CHC team members focused on prevention and supportive services rather than on family practitioner-driven curative and rehabilitative care.

Assisted Living. Assisted-living facilities are community-based residential facilities where adults live and receive a range of support services, including personalized assistance in achieving optimal independence. Personal assistance services “promote maximum dignity and independence through meal preparation, personal hygiene practice, mobility, and socialization.” These facilities usually combine professional and nonprofessional staff on an around-the-clock basis.

Home Care. Canadian health care is shifting from an institution-based system to one in which community care is playing a greater role (see Chapter 4). Home care is the provision of health care services and equipment to clients and families in their homes. Home care is not included in the *Canada Health Act* as a medically necessary service, so the range of public funding varies significantly across jurisdictions (Health Canada, 2010d). All provinces and territories fund assessment and case management, nursing care, and support services for eligible clients. Clients may pay for extra professional or support services through insurance programs or pay-for-service arrangements. The federal government delivers home care services to First Nations people on reserves and Inuit people in designated communities, members of the armed forces and the RCMP, federal inmates, and eligible veterans.

Home care involves primarily nursing care as well as other professional and nonprofessional services, such as physiotherapy; social work; and occupational, respiratory, and speech therapy. Support services are nonmedical services and include personal care, assistance with activities of daily living, and assistance with home management.

Home care was created to provide individualized care for people after hospital discharge but has increasingly included clients in a range of ages from very young to very old; those with mental, physical, or developmental challenges; and those needing recovery to end-stage care. CHA (2009) found home care to be a cost-effective alternative to acute care, maintaining clients at optimal levels of functioning, delaying institutionalization, and providing a viable substitution for health services (e.g., early discharge, home intravenous). Nurses working in home care have experience with all levels of care within the home setting (see “Levels of Care”), as well as complex caseloads. Home care nurses respond to issues of cultural diversity

(see Chapter 9), family nursing (see Chapter 19), and patient safety (see Chapter 36).

Adult Day Support Programs (ADSPs). Adult day support programs are associated with a hospital or long-term care facility or exist independently. As an alternative to hospitalization, continuous health care services are provided for specific clients (e.g., those with dementia, those needing physical rehabilitation or counselling, or those with chemical dependency). According to the Family Caregivers' Network Society (2010), over 2.8 million Canadians provide care and support for an adult family member or friend. ADSPs play a critical role in enabling a caregiver's participation in care while continuing to work. Nurses in ADSPs provide continuity between the care delivered at home and care delivered in the centre. For instance, nurses administer treatments, encourage clients to adhere to prescribed medication regimens (see Chapter 33), link clients with community resources (see Chapter 4), and provide counselling services (see Chapter 19).

Community and Voluntary Agencies. National, provincial, and regional voluntary agencies (e.g., Heart and Stroke Foundation of Canada, Canadian Diabetes Association) meet specific needs. Most voluntary agencies offer programs to educate about, prevent, and detect specific conditions, rather than treat them. Voluntary agencies depend on the help of professional volunteers (e.g., VON [Victorian Order of Nurses]) and lay volunteers (e.g., Meals on Wheels). They offer financial support for training physicians and nurses through fundraising and donations.

Occupational Health. More than 2000 members of the Canadian Occupational Health Nurses Association (2011) deliver integrated occupational health and safety services to individual and communities of workers. RNs certified in occupational health have met specific eligibility requirements, passed a written examination, and achieved a national standard of competency. Occupational health nurses often work with physiotherapists, occupational therapists, and psychologists for large corporations in broad-based programs encompassing the range of promotion, maintenance, and restoration of health and prevention of illness and injury.

Hospice and Palliative Care. A hospice is a family-centred care system that enables a person to live in comfort, with independence and dignity, while living with a life-ending illness. Hospice care is palliative, not curative (see Chapter 28). Its multidisciplinary approach involving physicians, nurses, social workers, pharmacists, and pastoral care staff is crucial. Hospice nurses work in hospitals, free-standing hospices, or the home, caring for patient and family during the terminal phase of illness, at the time of death, and beyond in the form of bereavement counselling to the family and support network.

Parish Nursing. Parish nursing is becoming more popular as faith-based communities promote and maintain members' health. According to the Canadian Association for Parish Nursing Ministry [CAPNM] (2011), a parish nurse is a RN with specialized knowledge who is called to the ministry and affirmed by a faith-based community to promote health, healing, and wholeness. Currently, CAPNM's approximately 160 members promote the integration of faith and health through advocacy, counselling, education, referrals, and linkages to health and intersectoral services (CAPNM, 2011).

Levels of Care

Five levels of health care exist: promotive, preventive, curative (diagnosis and treatment), rehabilitative, and supportive

(including home care, long-term care, and palliative care) (CNA, 2003; WHO, 1978).

Level 1: Health Promotion

The first level of health care, **health promotion**, focuses on "enabling people to increase control over, and to improve their health" (HCC, 2005). Examples include provision of wellness services, antismoking education, promotion of self-esteem in children and adolescents, and advocacy for healthy public policy.

Health promotion takes place in many settings. For example, community clinics offer prenatal nutrition classes that promote health of the woman, fetus, and infant. The *Ottawa Charter for Health Promotion* (the *Charter*) (Lalonde, 1986) lists five action strategies for health promotion: building healthy public policy, creating supportive environments, strengthening community action, developing personal skills, and reorienting health care services. The *Charter* details how health care providers enable clients to make decisions that affect their health. Furthermore, the foundation of health promotion consists of "the fundamental conditions and resources for health [which] are peace, shelter, education, food, income, a stable ecosystem, sustainable resources, social justice, and equity" (Lalonde, 1986) (see Chapter 1).

Level 2: Disease and Injury Prevention

The second level includes illness prevention services to help clients, families, and communities reduce risk factors for disease and injury (see Chapter 4). Prevention strategies include clinical actions (screening, immunizing), behavioural aspects (lifestyle change, support groups), and environmental actions (societal pressure for a healthy environment) (see Chapter 1).

Level 3: Diagnosis and Treatment

Diagnosis and treatment focus on recognizing and managing clients' existing health problems. Three sublevels of diagnosis and treatment care exist: primary, secondary, and tertiary. These refer to health care activities aimed at individuals, rather than at families or communities.

- **Primary care (PC)** is the first contact of a patient with the health care system that leads to a decision regarding a course of action to resolve any actual or potential health problem. PC providers include physicians and NPS in practice settings such as physicians' offices, nurse-managed clinics, and schools. The focus is on early detection, routine care, and education to prevent recurrences. (Recall and note differences from PHC.)
- **Secondary care** usually occurs in hospital or home settings and involves specialized medical service by a physician specialist or a hospital on referral from a PC practitioner. Secondary care considers definitive diagnosis or clients requiring further diagnostic review.
- **Tertiary care** is specialized technical care in diagnosing and treating complicated or unusual health problems. Tertiary care occurs in regional, teaching, university, or specialized hospitals that house sophisticated diagnostic equipment and perform complex procedures.

Level 4: Rehabilitation

Rehabilitation is the restoration of a person facing life-altering health situations through education, advocacy, collaboration, and research (Canadian Association of Rehabilitation Nurses, 2010). Rehabilitation occurs after a physical or mental health illness, injury, or chemical addiction or is related to chronic

illness, disability, frailty, and aging. As a condition stabilizes, rehabilitation assists clients to return to their previous level of function or reach an optimal level of function, thereby enhancing quality of life while promoting independence and self-care.

Rehabilitation nurses often work with physical, respiratory, occupational, and speech therapists. Ideally, rehabilitation begins the moment a patient enters a health care setting for treatment. For example, some orthopedic programs have clients undergo physiotherapy exercises before major joint repair so as to enhance their recovery (see Chapter 35). Nurses have a key role in the continuity-of-care aspects of rehabilitation across agencies and settings.

Level 5: Supportive Care

Clients of all ages with illnesses or disabilities that are chronic (i.e., are long term) or progressive (i.e., worsen over time) may require supportive care. **Supportive care** consists of health, personal, and social services provided over a prolonged period to people who are disabled, who do not function independently, or who have a terminal disease. With increasing life spans, escalating chronic conditions, and diverse care settings (i.e., institutional, community, and home), demand for supportive care will continue to grow. Two examples of supportive care include the following:

Palliative care serves people living with progressive, life-threatening illnesses, or conditions. Palliative care, whether provided in hospital, hospice, or home, addresses physical, emotional, social, and spiritual needs of the patient and family.

Respite care provides short-term relief or time off for family caregivers by health care providers and/or trained volunteers in either institutional (i.e., ADSP) or home settings.

Challenges to the Health Care System

Canada's health care system is faced with many issues and challenges, categorized either as cost accelerators or as costs associated with providing equal care and access for all.

Cost Accelerators

Technologies. New technologies, such as new-generation antibiotics, diagnostic imaging equipment, and specialized beds, have become integral in the treatment of diseases and disabilities. The effectiveness of technical advances has reduced mortality and morbidity rates; however, costs have increased with these innovations.

As an essential element of future health care delivery, **e-health** (see Chapter 16) encompasses and is embedded in a number of health applications from administrative to direct care. There is an emphasis on developing a national health info-structure to support direct care, telehealth, **m-health** (mobile applications), **remote monitoring**, and maintenance of **electronic health records (EHRs)**. (See Chapter 15 for more on EHRs.) Remote monitoring supports information-based, near real time health care by using wireless electronic capacities to link medical providers to patients using instruments (e.g., blood pressure monitors) who are not located with the providers. EHRs are essential for interprofessional collaborative practice and sharing of records across the health care continuum. **Nursing informatics** is an emerging area that "integrates nursing, its information and knowledge and their management with information and communications technologies to improve the health of people, families, and communities

worldwide" (Canadian Nursing Informatics Association, 2011).

Demographics. As the population ages, chronic and age-related diseases are increasing in frequency, largely because older people are more likely to become ill and disabled. They require more treatment and drugs, resulting in higher costs to the health care system. According to Statistics Canada (2011), nationally, 14.1% of Canada's population was made up of older adults aged 65 and over, up from 13.4% in 2007. This trend will persist over the next 20 years, as each year more than half a million baby boomers will be turning 65 (Corbella, 2008). Another demographic contributing to higher health care costs since the mid-1980s is increasing maternal age.

Consumer Involvement. Canadians are better informed than ever about their health care options and demand a high level of **quality care**. For example, clients might request an expensive diagnostic test such as magnetic resonance imaging (MRI), whereas previously an X-ray would have sufficed.

There is a growing presence of and demand for **self-care** activities to enhance health, prevent disease, evaluate symptoms, and restore health either independently or in collaboration with health care providers (Consumer Health Products-Canada, 2009).

Equality and Quality

The Canadian health care system strives to provide quality care and access to care for all.

Income Status. Income assistance programs for older adults and social assistance recipients cover some health care expenses not covered by Medicare, such as optometry, dentistry, and pharmaceuticals. Canadians with low wages experience poorer access and poorer health status. For example, they tend to seek dental and optometric care less than other Canadians.

Cultural Competence. Canada is a country of diversity, creating an imperative for a health care system and providers to be responsive and respectful (see Chapter 9).

As discussed earlier, the federal government has a key role in the provision of health care services to First Nations and Inuit people. Since 1986, a movement to transfer responsibility and control for health services to First Nations and Inuit governance has emerged (Health Canada, 2003). The shift in the health structures and PHC seem to hold the promise of aligning with Aboriginal peoples' beliefs, especially with regard to holism and integration.

Immigration has shaped Canada's population historically. Between 2001 and 2006, newcomers represented two-thirds of the population growth, with significant influxes in urban centres and neighbouring municipalities (Chui et al., 2007). Linguistic and cultural diversity is immense, with more than 70% of newcomers reporting a mother tongue other than English or French (mostly Chinese) (Chui et al.). Variations in the health status of the newcomers are based on their reasons for immigration, place or circumstances of origin, and social supports (Wayland, 2006). Issues of income, psychological well-being, and ethnic support are important aspects of adjustment and risk reduction (Wayland).

Evidence-Informed Practice (EIP). Nursing practice is constantly evolving, and nurses must remain responsive to new developments, innovations, and information. According to Cleary-Holdforth (2009), **evidence-informed practice** (see Chapter 6) is a critical aspect of clinical decision making and an influential strategy for nurses to improve patient outcomes.

EIP resources are available on CNA's portal called NurseONE/INF-Fusion (<http://www.nurseone.ca/>). NurseONE is a personalized, interactive Web-based resource providing a gateway for nurses and nursing students to search for information about enhancing patient care, managing their careers, pursuing lifelong learning opportunities, and connecting to colleagues (Bassendowski et al., 2008).

Quality and Patient Safety. According to the International Society for Quality in Health Care (ISQua) (2007), quality practice and performance improvement underpin the work of the health care team across the continuum of care. Quality and safety in health care involve health facilities and providers, clinicians, and other professionals, providing the right care for the right people at the right time and in the right amount (ISQua, 2007). ISQua reported that consumers consistently rank quality and safety of care high among their concerns.

According to Baker and Norton (2004), approximately 70,000 preventable adverse events occur annually in Canadian hospitals, which translated to between 9000 and 24,000 deaths in 2000. One out of every nine clients contracts an infection while in hospital, a statistic mirrored in the number of medication-related errors (Baker et al., 2004). The Canadian Patient Safety Institute (2010) provides leadership on patient safety and fosters a culture to improve care through innovation and professional development.

Quality Workplaces. Health care is delivered in a diverse range of environments, a situation that challenges quality issues and affects recruitment and retention. Sustainable and quality workforces, organizational efficiencies, and improved patient care are related to improved work environments (Health Canada, 2010c). The Pan-Canadian Health Human Resource Strategy (PC HHRS) articulates approaches to enhancing work and learning conditions necessary to maintain an experienced, dedicated and skilled workforce for high quality, safe, and timely care (Health Canada, 2010c).

Privatization of Services. Governments are struggling to maintain the principle of universality against the benefits and challenges of privatization. At present, not all health care services are available and accessible to all Canadians. For example, infertility treatments and laser eye surgical procedures are performed in private offices, available to clients who can afford them. Discussions persist about what constitutes "medically necessary services" and what makes up universal "core services," with many experts contending that the survival of medicare depends on privatizing more parts of the health care system.

Health Care Human Resources. In 2006, more than 1 million people (about 6% of the total workforce) in Canada worked directly in health-related occupations (Chui et al., 2007). Despite these numbers, accessibility to health care services is compromised by shortages of physicians, nurses, and other health care professionals. Health Canada (2010c) states health and human resources planning must occur within the broader health care system, recognizing systemic challenges of wait times, patient safety, and bed closures.

Aboriginal peoples are significantly under-represented in health professions. Health Canada established a five-year initiative, known as the Aboriginal Health Human Resources Initiative (AHHRI), focusing on increasing Aboriginal representation in health professions and retention of health care providers successfully working with Aboriginal peoples as part of the PC HHRS. The AHHRI-Phase II was extended in December 2010.

Nursing's Future in the Emerging Health Care System

This chapter provided extensive discussion about restructuring and challenges within the Canadian health care system. Within the context of restructuring and complexities within the Canadian system, nursing roles continue to evolve and diversify. In the future, nurses will increasingly be regarded as critical stakeholders, partners, and providers within the emerging health care system. Nurses will continue to draw on their historical legacy, forge ahead, and use evidence to inform their pursuit of excellence and quality in care, while advocating and innovating for the benefit of their clients.

❖ KEY CONCEPTS

- Medicare is a key component of Canada's social safety net.
- Government plays a major role in the Canadian health care system by co-funding national health insurance and by setting health care policy in accordance with the *Canada Health Act*.
- The *Canada Health Act* forbids extra billing and user fees while articulating the principles of public administration, comprehensiveness, universality, portability, and accessibility.
- Health care services are provided in institutional, community, and home settings; across all age groups; and for individual, family, group, community, and population clients.
- Five levels of health care are promotive, preventive, curative, rehabilitative, and supportive.
- Escalating costs and consumer expectations challenge the health care system to seek and deliver innovative, efficient, and quality care.
- Issues of equality, access, interprofessional approaches, and continuity of care challenge the health care system.
- The rise of PHC and home care is a result of health care reforms.
- Successful health promotion and disease prevention programs help clients acquire healthier lifestyles and achieve a decent standard of living.
- Demographic, geographical, and technological realities affect the functioning and restructuring of the Canadian health care system.
- The existence of sufficient, diverse, and qualified human health resources is a key challenge to the Canadian health care system.
- Enhancing the health of Aboriginal peoples in Canada is a significant challenge to society and to the health care system.
- Nurses must continually seek out information and evidence to remain responsive to providing quality, culturally competent, and safe care.

❖ CRITICAL THINKING EXERCISES

1. Debate the following issues respecting the future of the Canadian health care system: escalating costs, privatization, continuity of care, electronic health records.
2. Consider and describe how the national economy and technology have changed the Canadian health care system. What are the implications for nursing?
3. Mr. W., a 68-year-old widower with no immediate family supports, is scheduled to have major surgery to replace the joint in his hip. He is generally in good health and lives in a seniors-only apartment complex in the centre of town. After surgery, he will need extensive therapy in order to walk. Describe the types of health care services, patient safety issues, and technological supports that might play a part in his care.

❖ REVIEW QUESTIONS

- Canada has undertaken an effort to reduce wait times, reduce duplication of tests, and support coordination of care through which agency?
 - Canada e-Health
 - Canada Infoway
 - Canada m-Health
 - Electronic Health Records
- Which of the following people are insured under the *Canada Health Act*?
 - Aboriginal peoples
 - RCMP members
 - Members of military services
 - Persons in transit between provinces
- Public health focuses on
 - Treatment
 - Promotion
 - Intervention
 - Institutionalization
- The *Canada Health Act* embraces the following five principles:
 - Public administration, comprehensiveness, universality, portability, accessibility
 - Social justice, equity, acceptability, efficiency, effectiveness
 - Accountability, equality, economy, collaboration, coordination
 - Insured health services, provider compensation, hospital services, community care, and pharmaceuticals
- An adult day support program is an example of a(n)
 - Home care agency
 - Institutional agency
 - Community agency
 - Ambulatory care centre
- What are the five levels of health care services?
 - Promotive, preventive, curative, rehabilitative, supportive
 - Prevention, protection, diagnosis, treatment, palliative care
 - Promotion, prevention, treatment, PHC, diagnosis
 - Assessment, diagnosis, planning, implementation, evaluation
- Which trend is most critical in the future health human resources plan?
 - Keeping sufficient physicians
 - Ensuring adequate providers in rural and remote areas
 - Ensuring ethical recruitment and retention
 - Increasing number of health providers to respond to emerging health needs
- Which is not a cause of Canada's increasing health care costs?
 - Workplace injuries
 - Aging population
 - New technologies and pharmaceuticals
 - Chronic and emerging diseases

- A nurse organizes a blood pressure screening program as a _____ strategy.
 - Health promotion
 - Disease prevention
 - Continuing care
 - Rehabilitation
- Provision of specialized medical services by a physician specialist or a hospital is
 - Primary care
 - Primary health care
 - Secondary care
 - Tertiary care

❖ RECOMMENDED WEB SITES

Canadian Health Services Research Foundation: Research Theme: Primary Health Care: http://www.chsrf.ca/research_themes/ph_e.php

This site addresses initiatives of the foundation that relate to PHC reform and research.

Canada Health Infoway: <https://www.infoway-inforoute.ca/>

A not-for-profit corporation created by Canada's First Ministers to foster and accelerate development and adoption of EHR systems with compatible standards and communication technologies.

Canadian Institute of Health Information: <http://www.cihi.ca>

A not-for-profit organization seeking to improve the health care system and the health of Canadians by providing health information.

Canadian Public Health Association: <http://www.cpha.ca>

A national, not-for-profit association seeking excellence in public health nationally and internationally.

Health Canada: <http://www.hc-sc.gc.ca>

This site provides links to information about the Canadian health care system, such as the *Canada Health Act* legislation, and federal reports.

Canadian Patient Safety Institute: <http://www.patient-safetyinstitute.ca>

This institute was established to build and advance a safer health care system for Canadians. It reports on activities in leadership across health sectors and health care systems, highlights promising practices, and raises awareness with stakeholders and the public about patient safety.

Health Quality Council (Saskatchewan): <http://www.hqc.sk.ca>

The Saskatchewan Health Quality Council was established in 2002 through provincial legislation to improve health care in Saskatchewan by encouraging the use of best evidence.

Health Council of Canada: <http://www.healthcouncilcanada.ca/>

The Health Council of Canada fosters accountability and transparency by assessing, monitoring, and reporting progress in improving quality, effectiveness, and sustainability of the health care system for the well-being of Canadians.

Review Questions Answers

1. 2; 2. 4; 3. 2; 4. 1; 5. 3; 6. 1; 7. 3; 8. 1; 9. 2; 10. 3

Rationales for the Review Questions appear at the end of the book.

The Development of Nursing in Canada

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objectives

Mastery of content in this chapter will enable you to:

- Define the key terms listed.
- Discuss the historical development of professional nursing.
- Discuss the historical development of nursing education in Canada.
- Discuss the historical development of nursing practice in Canada.

key terms

International Council of Nurses (ICN), p. 36

Professional organization, p. 40

media resources

evolve WEBSITE

<http://evolve.elsevier.com/Canada/Potter/fundamentals/>

- Audio Chapter Summaries
- Examination Review Questions
- Glossary
- Student Learning Activities
- Weblinks

Over the centuries, the goals of nursing have been to help people maintain their health and to provide comfort and care to the sick. Modern nursing is a professional discipline with a unique body of knowledge applied to the needs of individuals and families. The foundations of professional practice emerge from historical and philosophical traditions in nursing and health care, social policy and practice, and ongoing research in nursing. It is interesting to explore the origins of nursing because they have contributed to modern nursing. The evolution of nursing has brought the profession to a challenging and exciting time in its history. There are tremendous opportunities to improve the health and quality of life of patients and communities with advances in professional knowledge and practice.

The philosophical and theoretical basis of the profession provides the necessary foundation for practice (see Chapter 5). Henderson's (1966) famous definition of nursing was adopted by the International Council of Nurses (ICN) in 1973 and continues to be the primary description of the role of the nurse:

The unique function of the nurse is to assist the individual, sick or well, in the performance of those activities contributing to health [and] its recovery, or to a peaceful death that the client would perform unaided if he had the necessary strength, will, or knowledge. And to do this in such a way as to help the client gain independence as rapidly as possible. (p. 15)

As a profession, nursing is committed to public service. The practice of nursing requires specialized knowledge that must be acquired and carries a high degree of responsibility. Nursing has practical and theoretical components, is motivated by altruism, and is based on ethical standards. The profession evolves as society, health care, and

social policies change. This chapter traces the roots of the nursing profession over many centuries to its establishment and development in Canada. Although there has been a dramatic increase in the nature and extent of knowledge and skills required for nursing, the professional mandate has remained relatively constant over time and continues to be an inspiring force for the profession. The transformation of the profession to the modern era is highlighted.

Highlights of World Nursing History

Nursing's historical roots are deep and honourable and can be traced over many centuries. In the sixteenth century B.C., the ancient Egyptians recognized the importance of preventing illness and maintaining health. They understood that a good diet was important in maintaining health and consumed a reasonably well-balanced diet of fruits, vegetables, fish, milk, legumes, seeds, and oil. Priest-physicians ministered to the people, using herbs to relieve pain and a variety of treatments for illness that were based on spiritual or mythological beliefs about its causation. The Papyrus Ebers and the Edwin Smith Papyrus came to light in Thebes (now Luxor) in 1862 and document how the Egyptians dealt with health and illness as far back as 3300–1500 B.C.

The theories of health and illness of the ancient Egyptians provided a framework for the development of medicine in ancient Greece. Although the early Greeks believed in the spiritual causes of disease, Hippocrates (circa 460–370 B.C.) was the first to make observations of patients and develop treatments on the basis of symptoms. He founded a school of medicine and wrote numerous books on disease. Hippocrates is considered the father of scientific medicine and Western medical ethics; he developed methods of treating disease and establishing ethical principles upon which practice was based. Through his influence, medicine developed into a science. Galen (circa A.D. 130–203), another Greek physician-scientist, made important contributions to the field of physiology before becoming physician to the gladiators. Knowledge acquired through Galen and other Greek physicians had a significant influence on the Romans.

The Romans recognized the importance of fresh water and hygiene for public health. As their cities grew and the water supply became inadequate, Roman engineers developed aqueducts in Rome between 312 B.C. and A.D. 226 to carry fresh water from distant springs. They also developed public baths and constructed public toilets and sewers, which greatly improved the health of the population.

The ancient Hebrews believed in a spiritual basis of illness and that following the Ten Commandments promoted health. They also recognized the importance of nutrition and developed dietary laws that protected the public by prescribing what foods could or could not be eaten together, or eaten at all, as well as guidelines for safely eating the meat of slaughtered animals. Nurses cared for the sick in the home and community and served as midwives during childbirth.

During the early Christian period, with the emphasis of Christianity on love for others, nursing became a caring service undertaken mostly by women. The Benedictine Order originated with St. Benedict of Nursia in A.D. 529 and is the oldest of the Catholic nursing orders. Fabiola, a well-to-do Christian woman in Rome, offered respite to ill and fatigued pilgrims travelling to the Holy Land. Later, during the twelfth and thirteenth centuries, hospitals were built to provide care for

the sick. The Knights Hospitallers of the Order of St. John of Jerusalem emerged from the Benedictine nursing tradition to become one of a number of religious orders formed during the Crusades (eleventh to thirteenth centuries) that were committed to caring for and defending pilgrims. When the Protestant Reformation took hold in Europe after the Crusades, monasteries were disbanded, and the hospitals and other institutions where monks and nuns cared for the sick and weary were closed. When new hospitals were built, untrained and unsuitable individuals were responsible for nursing patients. Conditions deteriorated as lack of sanitation prevailed and disease spread rapidly.

During the seventeenth century, conditions began to improve and there was greater emphasis on nursing. St. Vincent de Paul founded the Sisters of Charity in 1633 to care for the sick, poor, and orphaned. Because this order was non-cloistered (the first such order), the nuns were able to go into the community to care for people. For the most part, women who entered convents to become nurses came from the upper classes and were well educated. In Germany, Pastor Theodore Fliedner established his now rather famous Institute of Deaconesses at Kaiserwerth in 1836 to prepare women to serve as nurses.

Early History of Nursing in Canada

The roots of nursing and health care in North America may be found in the values and ideals of the European settlers in New France. At a time when knowledge of disease was primitive, technology was virtually nonexistent, and a few herbal remedies were the only medicines available, the practice of nursing developed as an integral part of the emerging health care system. Nursing care was often the sole weapon in fighting infectious disease. Its importance is underscored in accounts of the devastating epidemics of smallpox, diphtheria, cholera, typhus, trachoma, scarlet fever, and other infectious diseases that ravaged the population in continuing episodes (Paul & Ross-Kerr, 2011).

A long-established indigenous society existed in North America before the arrival of the first settlers. At the time of the first sustained contact with European people, the estimated number of indigenous people in North America was about 500,000, although this is acknowledged as probably a conservative number (Royal Commission on Aboriginal Peoples, 1996). The Aboriginal peoples also had health care knowledge of their own, including the use of herbal remedies to relieve symptoms of some diseases. Even after municipalities began to build hospitals and the number of doctors and nurses in western Canada grew after 1890, acquiring such services remained prohibitive due to cost and distance. Thus, during the late nineteenth and early twentieth centuries, indigenous women played essential roles within their own and newcomer communities as midwives, nurses, and caregivers. They used indigenous knowledge to care for many white settlers in western Canada (Burnett, 2008).

The First Nurses and Hospitals in New France

In 1608, Samuel de Champlain selected Quebec as the site for a colony of settlers to support the growing fur trade. For the next two decades, the first colonists in New France provided their own health care. The first laywoman to provide nursing care in New France was Marie Rollet Hébert. She and her husband, Louis Hébert, who was a surgeon-apothecary,

emigrated at the request of Champlain in 1617. Mme Hébert became the first woman to emigrate to the new world from France and cared for Native people and settlers alike. Her husband's apothecary and agricultural skills helped prevent starvation and mitigate illness (Brown, 2002). Although she was a layperson, Mme Hébert extended care to Aboriginal people and settlers who were ill, just as she would for ill family members.

The first nurses to tend the sick in a type of health care centre were male attendants at a "sick bay" established at the French garrison in Port Royal in Acadia in 1629 (Gibbon & Mathewson, 1947). The Jesuit priests, who were missionary immigrants to New France, also served as nurses. Their care for the sick aided their mission to convert the Aboriginal people to Christianity. Their call for assistance led to the missionary efforts of religious orders and laypersons, all of whom came to New France voluntarily to assist the Jesuits.

Because the Protestant Reformation was unsuccessful in France, religious orders there remained strong and sent nuns to the missions in New France. Most of the women who came to New France were motivated by Christian ideals of educating Native children and caring for the sick. Although small in number, these women led the young colony's efforts in health care and teaching. They proved remarkably resilient as they battled smallpox epidemics and tended to people injured in the Iroquois wars.

The first nursing mission was established in 1639 at Sillery, outside the citadel of Quebec, by three Augustinian nuns who were Hospitalières de la Miséricorde de Jésus. No sooner had they arrived than they found themselves overwhelmed with patients from the raging smallpox epidemic. As the population grew, they had enough new recruits that they no longer needed to ask for nuns to come from France to assist them. It has been said that "Quebec . . . had a seminary, a hospital, and a convent, before it had a population" (Parkman, 1897, p. 259). This mission later became known as Hôtel-Dieu, Quebec's first hospital. As a result of the Iroquois wars, the nuns abandoned this mission at Sillery in 1644 and moved it inside the citadel. An indication of the quality of the care provided by the nuns is the fact that 93% of the patients admitted to the Hôtel-Dieu of Québec survived (Rousseau, 1977; Hamelin, 1981).

In 1641, Jeanne Mance came to New France to found a hospital in the yet unsettled region of Ville-Marie (later Montreal); Mance and her fellow travellers were not warmly received. Their intentions to care for the sick were viewed with suspicion by the settlers at Quebec, where they spent the winter. When she arrived at Ville-Marie in 1642, Mance was the only person with health care knowledge in the new settlement. She was a leader in the community and became an inspiration for later generations of nurses (Box 3-1). It is important to recognize that it was nurses rather than physicians who both provided and administered health care for the Native peoples and settlers in New France from the outset of the settlement.

The Birth of Home Visiting and the Grey Nuns

A uniquely Canadian order of nuns, the Sisters of Charity of Montreal, was formed in 1738 by Marguerite d'Youville, a widow who was a niece of the explorer La Vérendrye. The Grey Nuns are considered the first visiting nurses in Canada. They were also the first noncloistered order, beginning as a small group of women with charitable intentions who "agreed

to combine their possessions in a house of refuge chiefly for the poor" (Gibbon & Mathewson, 1947, p. 45). According to Eccles, "Poverty was not regarded as a sin or a crime, but as a fault in the fabric of the society that had to be mended" (1974, p. 69). They engaged in many activities in order to subsist, such as admitting wealthy paying guests to hospital as well as patients who required care. Because what they were doing was highly unusual, some were hesitant to trust them and they were called "les soeurs grises," a derogatory term with a double meaning, that is, the Grey Nuns and the "tipsy nuns." However, the goodness of their intentions was clear and they were respected for their work. They proudly referred to themselves as the Grey Nuns from then on and were given a charter to take over the General Hospital of Montreal. To meet their expenses, they had to be very innovative; they made military garments and tents, started a brewery and a tobacco plant, and operated a freight and cartage business (Ross-Kerr, 2011).

Nursing During the British Regime

During the war between the British and the French in 1756, the Grey Nuns designated a ward of the General Hospital of Montreal for the care of English soldiers, thus caring for soldiers on both sides of the conflict. The status of nursing and the quality of care provided differed markedly between Canada and Great Britain. Nursing in Britain had fallen into disrepute after Henry VIII's renunciation of the Catholic Church. The nursing orders of nuns, which had previously provided the nursing services in the large London hospitals, were replaced by women of questionable morals and little knowledge. However, nursing remained strong in early Canada because of the influence of France, where nursing was performed at a higher standard. In the transfer of authority for Montreal to the British in 1760, General Amherst declared: "Of the goodwill I have to a Society so worthy of respect as that of the Monastery of St. Joseph de l'Hôtel Dieu de Montréal, which can count so far as the British Nation is concerned on the same protection that it has enjoyed under French rule" (Gibbon & Mathewson, 1947, p. 1).

Infectious diseases carried by immigrants and travellers spread rapidly in the British colonies. The increasing populace and continuing epidemics created a need for more health care facilities. In areas not served by the French-Canadian nursing orders, institutions were established with standards similar to those in Britain (Canadian Nurses Association [CNA], 1968). Laywomen offered services and organized groups to provide proper care, but because they lacked knowledge and skill, these efforts were largely unsuccessful. The established French-Canadian orders expanded their services, and new English-speaking orders were founded to help the sick and poor.

Health Care in the West and the Grey Nuns

In 1844, four Grey Nuns embarked on a perilous canoe journey from Montreal to St. Boniface, Manitoba, where their mission was to care for the sick. Soon after their arrival, a series of epidemics began. The nuns visited the sick at home, where they cared for people with measles, dysentery, and smallpox, and treated them with medicines and local herbs.

In 1859, another group of Grey Nuns travelled from Montreal by rail through the United States and then north to St. Boniface. After resting for a time, they set off by ox cart over rough terrain to arrive in what is now Alberta to establish their first mission in Lac Ste. Anne, where they visited patients in their homes and cared for them in the convent. Arriving before

► BOX 3-1 Milestones in Canadian Nursing History



Jeanne Mance, 1606–1673

Jeanne Mance was born in a wealthy family in Langres, France, in 1606. She was the daughter of a wealthy legal advisor to the court of the King of France and decided early to devote her life to God. She learned about New France from a cousin, a Récollet priest who had served there. She gained nursing knowledge and skills in Langres, where an epidemic of plague occurred and many people were wounded in the Thirty Years' War. Supported by a wealthy widow who wanted to finance a hospital at Ville Marie, Jeanne Mance sailed to

New France with Paul de Chomédey, Sieur de Maisonneuve, and his band of 40. Maisonneuve's mission was to establish a settlement at Ville Marie, but arriving in Quebec after a two-month voyage, the settlers learned that the governor was suspicious of their mission, and he tried to dissuade them from it.

They decided that it was too late in the summer to try to build the colony, so they remained in Quebec, involving themselves in the community. Mance spent time learning about nursing and health care in New France from the Augustinian nuns in their hospital.

In the spring, the settlers set out for Ville Marie in three boats and immediately began building houses and the Hôtel-Dieu. The next year, during an attack by the Iroquois, several settlers were killed, and others were taken hostage. The remaining settlers managed to finish the hospital and build a stockade around their colony. However, the attacks

increased, and Mance was kept busy caring for both wounded settlers and Aboriginal people. By 1649, the settlers' funds were low, and the colony was close to having to disband. Mance sailed to Paris, where she raised money and recruited settlers. Over the next few years, relations with the Iroquois continued to be poor. A guard was placed at the hospital and Mance slept within the fort. In 1650, the Iroquois killed 30 of 70 settlers.

Maisonneuve went to France in 1651 to gain further support and did not return for two years. This period was difficult, but Mance held the colony together during his absence. After a truce was reached between the French and the Iroquois in 1654, Mance was able to move back to the Hôtel-Dieu. In 1657, Mance fell on the ice, fractured her right arm in two places, and dislocated her wrist; as a result, she experienced continuing disability. She decided to make another trip to France to ask the order of nuns at La Flèche to come and help her in the hospital. While in Paris during prayer at the Seminary of Saint Sulpice, she discovered she could move her arm without pain, and it healed miraculously. She made her last trip to France in 1663, again to solicit funding for the colony because it was, again, close to bankruptcy. En route back, she contracted typhus and nearly died. She was shocked to find upon her return that Maisonneuve had been replaced as governor. In declining health, Mance was less able to help at the hospital. She died peacefully in her sleep in 1673.

As well as founding and managing the Hôtel-Dieu, Mance assisted Maisonneuve in running the colony as confidant, advisor, and accountant. She is hailed as a founder of the city of Montreal. Today, the Canadian Nurses Association awards its highest honour in the name of this courageous pioneer.

most of the settlers, the sisters established systems of health care to care for the sick. Demand from the populace was such that they later built a separate hospital building. Later, they established small missions in what is now northern Saskatchewan and the Northwest Territories to provide health care in Aboriginal settlements. In 1895, they were asked to construct a hospital in Edmonton (the General Hospital) because settlement was burgeoning there.

During the Northwest Rebellion of 1885, nurses and physicians were called to duty to care for those wounded in the rebellion of Métis and First Nations people against the governing authority of the Dominion of Canada. Among those who responded to the call for "trained" nurses were six Sisters of St. John the Divine, under the leadership of Mother Hannah Grier Coombs. Established in Toronto only a year earlier as the first Canadian Anglican Sisterhood, the group arrived at the base hospital in Moose Jaw after a six-week journey from Toronto. Two months after Louis Riel's surrender, the Sisters returned to Toronto, where they established the first surgical hospital for women (Domm, 2010).

The Nineteenth Century and Florence Nightingale

The movement to improve standards of nursing care in the mid-nineteenth century was spearheaded by Florence Nightingale, who is considered the founder of modern nursing. Critical public acclaim for her work in the Crimea in which the lives of thousands of wounded British soldiers were saved through good nursing riveted public attention upon the need for change. The comparability between the types of roles fulfilled by nurses trained by Nightingale in the school she

established and the roles customarily expected of women in nineteenth-century Britain was sufficiently evident that nursing achieved respectability and acceptance as a suitable field of work for women outside the home. In making this transition, nursing joined teaching, which had earlier become the first area of work to beckon to laywomen (Jackel, 1985). As with teaching, altruism and service were key elements in achieving public acknowledgement of nursing as particularly appropriate for women's abilities. Remarkable advances in health and health care and the rise of the hospital as a centre for care created a need for an increasingly large nursing workforce, and the nursing profession became one of the most significant avenues of work for women in this century.

Brought up in a wealthy family, Nightingale railed against the customs of her time that did not allow middle- and upper-class women to work outside the home: "Why have women passion, intellect, moral activity—these three—and a place in society where no one of the three can be exercised?" (Nightingale, 1872/1979). She was well educated and, against the wishes of her family, sought to prepare herself for nursing in 1850 by travelling to Kaiserwerth, Germany, where she worked with the German deaconesses under Pastor Fliegener. In 1853, she accepted the post of superintendent at Harley Street Hospital in London. When reports reached London of the appalling conditions for wounded British soldiers, Nightingale was asked to organize a group of nurses to go to the Crimea in 1854.

Nightingale and her staff of nurses made every possible attempt to care for the wounded and make them comfortable in ways that would foster their recovery. These women were

able to achieve dramatic reductions in morbidity and mortality rates, saving the lives of thousands of wounded British soldiers by applying principles of cleanliness and comfort to nursing care. Accounts of Nightingale's work were distributed to the British press by a reporter covering the war. She achieved worldwide fame because of her success in reducing morbidity and mortality through exemplary nursing care. A remarkable shift in public attitudes toward the acceptability of women doing nursing outside the home occurred as a result of her work.

At the same time, remarkable advances in health care and the expansion in the number and importance of hospitals created a need for nurses, and the nursing profession became one of the most significant avenues of work for women in the nineteenth century. Nursing thus became an instrument of women's emancipation against the prevailing middle-class restrictions on women working outside the home.

After remarkable service during the Crimean War, Nightingale became an advocate for the health of people, reform of the health care system of the British army, and educational preparation for nursing. She made her views known through voluminous writings and lobbied members of Parliament and acquaintances to support and act on her views. She drew conclusions from health data that she collected and analyzed, thus becoming known as the first health statistician. Nightingale is the subject of a large, ongoing scholarly writing project spearheaded by McDonald (2010) that incorporates the most significant analyses of her work to date.

Globalization and the Emergence of Modern Nursing

The history of modern nursing, at its heart, is a story of globalization. Nursing history is strewn with examples of nurses travelling across geographic and national boundaries to bring nursing service and training to communities in need (Grypma & Wu, 2012). In 1639, the first Catholic *religieuses hospitalières* sailed from France to New France to work at the Hôtel-Dieu de Québec, the first hospital in America north of Mexico (Violette, 2005). In 1819, France sent the Sisters of St. Joseph of Cluny to West Africa to engage in medical missions in Senegal (Grundmann, 2005). Starting in 1844, the Grey Nuns travelled from Montreal to remote settlements in Canada's west and north where, in some regions, their influence has continued until the present day (Canadian Broadcasting Corporation, 2010; Figure 3-1). Indeed, Catholic religious orders originally based in Europe were instrumental in the development of hospitals and nursing services in the United States, Canada, and Australia (Nelson, 2001; Paul, 2005). At the same time that Florence Nightingale's formal, standardized method of hospital-based nurses training and practice was gaining popularity in the late nineteenth century, a unique set of sociopolitical factors converged to set the stage for a new Anglo-Protestant brand of missionary nursing—and the birth of Canada's overseas missionary nursing movement.

Missionary Nursing

The centrality of Christian mission to three centuries of Canadian nursing peaked with the missionary movement that started in China in the late 1880s and spread across the globe—particularly Asia and Africa. In the late 1880s, China's defeat in the Opium Wars, the women's suffrage movement, the establishment of professional nursing education, advances in



Figure 3-1 Grey Nuns at St. Therese Hospital, Chesterfield, Nunavut, circa 1936. **Source:** Glenbow Archives, NA-1727-7.



Figure 3-2 Canadian missionary nurses in Huaqing, China, during the 1930s. **Source:** United Church of Canada Archives, Toronto. Access #1999.001P-1657.

transportation, and the evangelistic student missionary movement converged to provide an unprecedented opportunity for unmarried, ambitious, and intelligent women looking for a way to express their religion in practical terms—as missionary nurses (Grypma, 2012). When the Presbyterian Church in Canada commissioned its first missionary nurse, Harriet Sutherland, to China in 1888, it initiated a wave of an estimated 100 Canadian missionary nurses to China (Figure 3-2). Before Mao Zedong's expulsion of foreigners from China in 1949, these Canadian nurses helped to establish hospitals and training schools in at least five provinces of China. They were among the cadre of Western missionaries credited with the birth and growth of modern nursing in China (Grypma, 2008). Although Canadian missionary nursing would continue in other regions, after the closure of the China field in 1949, missionary nursing moved from the centre to the margins of Canadian nursing practice (Grypma, 2007).

Nursing in Remote Regions of Canada

Remote nursing is a distinguishing feature of Canadian nursing. Outpost and outport nursing stations provided care for northern, newcomer, and Aboriginal communities dispersed across Canada's vast landscape. Since the early



Figure 3-3 Red Cross nurse stopping for lunch, Pouce Coupe, British Columbia, circa 1920s. **Source:** Glenbow Archives, NA-2903-67.

twentieth century, people living in regions considered too small or too remote for hospitals or physician care depended on nurses for their health care needs. Nursing work in remote regions was crucial and all encompassing. In the absence of physicians, nurses in outpost and outport nursing stations provided public health, diagnostic, and emergency medical services. Nurses learned and practised medical skills independently through necessity. Having experienced high levels of independence, northern nurses resented and resisted situations that called for subservience to physicians or other “southern” authorities who were keen to restrict their care (Rutherfordale, 2008).

The Grenfell Mission relied heavily on nurses in its efforts to provide health care for people living along hundreds of miles of coastline in Newfoundland and Labrador between 1894 and 1981. In addition to standard nursing duties, the station nurse’s responsibilities involved operating the dispensary, midwifery, public health, first aid, and dentistry (Coombs-Thorne, 2010). Similarly, nurses working at Red Cross Outpost stations in Ontario between 1922 and 1984 acquired diverse skills considered more in the purview of physicians, including suturing wounds, administering anaesthesia, taking X-rays, and diagnosing illnesses (Elliott, 2010) (Figure 3-3).

Prior to World War II, living conditions for northern populations—primarily Aboriginal—were appalling. Most Western health care to the Arctic was provided under the auspices of Anglican and Roman Catholic churches as “home” missions. In northern Saskatchewan, there was an almost complete absence of government-run services. The end of World War II brought an onset of resource development in northern regions of Canada. The Canadian government increased efforts to provide health care in the Canadian Arctic and, by 1963, the

“Indian and Northern Health Services” branch had a staff of 2500 nurses, doctors, dentists, and administrators (Rutherfordale, 2010). In northern Saskatchewan, nursing was one of many institutions introduced into the region to modernize and improve people’s lives (McBain, 2010). Nursing stations and nurses were vital in providing much-needed professional health care. Those who worked in these settings had opportunity to develop skills, confidence, and independence not typical of—or transferable to—urban hospital settings.

Gender and Diversity in Nursing

For much of its early history, nursing in Canada was considered a suitable profession for young, unmarried, white, Christian women. Since the 1960s and 1970s, the nursing profession has become increasingly aware of the need for gender balance and cultural, ethnic, and religious diversity. As a profession, nursing is in transition from one that has been predominantly female in character to one that is gender balanced. Traditional societal values that negate nurturing roles for men have been changing. However, even though the number of men employed in nursing in Canada has increased, the most recent statistics show the proportion of male nurses as being only 6.0% of the total nurse population, a slight increase over the 4.7% it represented in 2000 (CNA, 2006). This is remarkable at a time when the proportion of women in traditionally male-dominated professions has increased at a phenomenal rate. O’Lynn and Tranbarger (2006) pointed to communication problems, reverse discriminatory practices, and gender-based barriers for male students in nursing. However, although many factors have deterred men from pursuing careers in nursing, some of the negative influences are slowly beginning to change.

Canadian society has also become multicultural. The increase in racial, ethnic, and cultural diversity has meant that individuals of different races, ethnic descent, and cultural backgrounds are present in every major population and occupational group. The benefit to Canada of this new diversity is inestimable and provides a far richer background for local, national, and global relationships. Some groups have historically been underrepresented in certain professions, including nursing, in comparison with their representation in the population. Recognition of the contributions of different ethnic and cultural groups, including Aboriginal groups, to the cultural mosaic in Canadian society has been slow in coming.

Villeneuve (2002–2003) decried the fact that the majority of nurses in Canada remain white and female, a situation common in the health care professions. Gates (2007) found that the greater the perceived increased difference in status between a staff nurse and others in the setting, the weaker was the nurse’s intent to remain on the job. There has been pressure for the profession to enhance and improve programs in order to encourage nurses with minority cultural and racial backgrounds to enter programs and remain committed to their choices.

Nursing Education in Canada

In 1860, Florence Nightingale established a financially independent school of nursing in association with St. Thomas’s Hospital in London, England, with funds from the Nightingale Fund, a large sum of money from unsolicited donations to Nightingale in appreciation for her work in the Crimea.

Unfortunately, the educational model of the Nightingale school was missing from new hospital schools. This was

► BOX 3-2 Milestones in Canadian Nursing History

**Mary Agnes Snively, 1847–1933**

Born in St. Catharines, Ontario, Mary Agnes Snively was a teacher before she was a nurse. Upon graduation from the school of nursing at Bellevue Hospital, New York, in 1894, she was appointed Lady Superintendent of Nurses at Toronto General Hospital and director of the school of nursing. The school, founded along with the hospital three years earlier, was in a state of disorganization.

Students provided most of the nursing care at Toronto General Hospital at little cost to the hospital. Snively found no organized plan for classes or clinical experience, nor was there a residence (students were housed in various locations in the hospital). Written records of nursing care, medical orders, and patient histories were also lacking. Recruiting desirable applicants was difficult because students in the school faced so many hardships that parents were reluctant to allow their daughters to seek admission.

Snively rectified all these deficiencies. A residence was soon built; she developed a curriculum plan, including nursing theory and practice,

and she lengthened the education period to three years. By the end of her tenure in 1910, the Toronto General Hospital school was thriving as the largest school of nursing in Canada with hundreds of graduates, a full complement of students, and many more seeking admission. All parental skepticism had been overcome, and Toronto General Hospital served as a model for others across the country.

Snively achieved acclaim for her organizational work. She helped found the first nurses' alumnae association in Canada at Toronto General Hospital in 1894. She also attended the historic 1899 founding meeting of the ICN in London, England, and was elected first honorary treasurer of the ICN, even though Canada did not have the necessary national nursing association to become an ICN member at the time. In 1907, Snively established the Canadian Society of Superintendents of Training Schools of Nursing, and, recognizing that an organization that would include all nurses would be needed for Canada to become a member of the ICN, she was the driving force behind the 1908 founding of the Provisional Organization of the Canadian National Association of Trained Nurses (later the CNA), becoming its first president. She shepherded the entry of the fledgling Canadian organization to membership in the ICN and served later as ICN vice-president.

Sources: Gibbon, J. M., & Mathewson, M. S. (1947). *Three centuries of Canadian nursing*. Toronto: Macmillan; and Riegler, N. (1997). *Jean I. Gunn, nursing leader*. Markham, ON: Associated Medical Services with Fitzhenry and Whiteside.

largely because the new schools had no financing and required students to provide nursing service to the hospital in return for their education and living expenses, which enabled hospitals to provide nursing services at minimal cost. The race to establish hospitals in the early 1890s was undoubtedly spurred on by the financial benefits of establishing associated schools of nursing. The financial advantage to the hospital of operating a school of nursing was clear, and this led to the need for hospitals to establish nursing schools to give them a competitive edge relative to other institutions to which paying patients might turn for care. Operating a training school also provided security against incurring financial loss if the number of paying patients was to drop at any point. Therefore, education of nurses became closely associated with hospitals at a developmental stage in the establishment of both hospitals and schools of nursing. The early hospitals were challenged financially because they did not charge poor patients. Services thus had to be of high enough quality to attract paying patients; a training school attached to a hospital ensured a higher standard of care than in one without a school (Young, 1994).

The First Canadian Nursing Schools

The first hospital diploma school in Canada, the St. Catharines Training School, opened in 1874 at the St. Catharines General and Marine Hospital. Admission standards were “plain English education, good character, and Christian motives” (*St. Catharines Annual Report*, cited by Healey, 1990). At that time, nursing was still considered an undesirable vocation for a refined lady in Canada, the only acceptable profession being teaching (Healey, 1990). Students learned chemistry, sanitary science, physiology, anatomy, and hygiene. They were taught to observe patients for changes in temperature, skin condition, pulse, respirations, and functions of organs and to report “faithfully” to the attending physician (Healey, 1990).

The School for Nurses at the Toronto General Hospital was established in 1881; Mary Agnes Snively was appointed

superintendent in 1884 (Box 3-2). Although work and living conditions were poor, Snively worked hard to improve the program. In 1896, she introduced a 3-year course with 84 hours of practical nursing and 119 hours of instruction by the medical staff (Gibbon & Mathewson, 1947).

In Montreal, after several unsuccessful attempts, the School for Nurses at the Montreal General Hospital was established in 1890 under the direction of Nora Livingston. Conditions were deplorable, but Livingston quickly made improvements. The popularity of the school increased rapidly. Livingston reported 169 applications in the first year, from which 80 students were accepted (Gibbon & Mathewson, 1947).

The move to establish hospital schools of nursing swept the country. The Winnipeg General Hospital initiated the first Training School for Nurses in 1887 in western Canada. A measure of its success was that 134 of its graduates served as nurses in World War I (Gibbon & Mathewson, 1947). By 1890, hospitals in Fredericton, Saint John, Halifax, and Charlottetown had opened schools. Vancouver General Hospital began a school in 1891, and in Alberta, a school was opened in Medicine Hat in 1894. By 1930, there were approximately 330 schools of nursing in Canada (CNA, 1968; Box 3-3).

The Impact of Nursing Organizations on Nursing Education

The Victorian Order of Nurses. At the same time that hospital training schools for nurses were being established, nurses began to advocate for improved educational standards and passage of legislation for their profession. Women's associations were instrumental in the public health care crusade in Canada and in the rise of nursing organizations. The National Council of Women under the presidency of Lady Ishbel Aberdeen, wife of the governor general of Canada, approved the formation of the Victorian Order of Nurses (VON) in 1898. Lady Aberdeen had conceived the idea of establishing the VON after she discovered the plight of

► BOX 3-3 Milestones in Canadian Nursing History



Jean I. Gunn, 1882-1941

Born in 1882 in Belleville, Ontario, Jean I. Gunn completed teacher training studies at Albert College in Belleville; her father was not in favour of her pursuing a career in nursing. Assisted by her mother, she went to New York to visit her sister and investigate nursing schools there. She then enrolled in the School of Nursing at Presbyterian Hospital, New York, graduating in 1905. After experience at her alma mater and in community nursing, Gunn was appointed

superintendent of nurses at the Toronto General Hospital in 1913. In this position, she was also responsible for the school of nursing.

Gunn recruited outstanding nursing administrators to assist her and became involved in provincial, national, and international health care and nursing organizations. She was a tireless worker and served with many organizations. Gunn was very supportive of the Toronto General Hospital alumnae association that in 1904 helped establish the Graduate Nurses' Association of Ontario (later the Registered Nurses' Association of Ontario) and pressed for legislation for the registration of nurses. She became secretary of the Canadian National Association of Trained Nurses in 1914 and president in 1917. She served on the executive of the National Council of Women and became very involved in the Canadian Red Cross Society, for which she chaired a committee on surgical dressings during World War II. In this role, she oversaw the production of millions of dressings by female civilian volunteers.

Nurses were in short supply during this time. With most men in the armed forces, many industrial jobs were now open to women and at wages far surpassing those of nurses. In 1917, Gunn pressed for the establishment of a permanent cadre of trained nurses for national service. She continued to work for the registration of nurses, which came to fruition in Ontario in 1922.

Gunn advocated for nursing and nurses on many fronts. She castigated hospital boards for reviewing costs of hospital services while

ignoring the savings that accrued from educating a nurse. She was passionately interested in improving standards of nursing education. She decried the exploitation of nurses in schools of nursing and worked with other nursing leaders to establish the Weir study of nursing and nursing education, jointly sponsored by the CNA and the Canadian Medical Association. The 1932 Weir report confirmed the deficiencies that she and other nursing leaders had publicized for so long, and she campaigned for the implementation of its recommendations.

Gunn also envisioned university degree programs in nursing and in 1914 arranged for the Department of Social Service at the University of Toronto to give lectures to third-year Toronto General Hospital students. In 1917, a course in chemistry taught by university instructors was implemented. The following year, field experience in public health nursing was introduced, and Gunn organized centralized lectures among Toronto schools of nursing held at the University of Toronto.

Gunn is perhaps best remembered for her work establishing the Nurses' War Memorial, which recognized the service of military nurses during World War I. She lobbied politicians and other health care organizations extensively and raised money from 10,000 nurses and their organizations from all over Canada. The result was a bas-relief sculpture in white Carrara marble that was unveiled in 1924 in a prominent position in the Centre Block of the Parliament Buildings, located in the Hall of Honour, separating the House of Commons from the Senate. In 1932, Gunn was responsible for having the crest of the CNA added to the sculpture.

In recognition of her outstanding service to nursing and health care throughout her life, Gunn received a number of honours in her final years, including a King's Jubilee Medal in 1935 and a Doctor of Laws degree from the University of Toronto in 1938. Jean Gunn was a leader among leaders in nursing and an individual who was able to inspire nurses to contribute to the common good.

Source: Riegler, N. (1997). *Jean I. Gunn, nursing leader*. Markham, ON: Associated Medical Services with Fitzhenry and Whiteside.

women in western Canada who had to give birth in remote locations with no assistance. The formation of the VON signified a professional standard of education for Canadian nurses that recognized the need not only for altruism and compassion but also for nursing knowledge (Figure 3-4).

The International Council of Nurses. Nurses from around the world were beginning to form organizations, inspired by the leadership of women such as Ethel Gordon Fenwick. Editor of the *British Journal of Nursing*, she attended the 1893 Congress of Charities, Corrections, and Philanthropy in Chicago, where she spoke of British struggles to achieve registration for nurses. Her North American colleagues had similar concerns. After the congress, they formed the American Society of Superintendents of Training Schools for Nurses of the United States and Canada, later to become the National League for Nursing Education, whose goal was to raise standards of nursing education. Soon afterward in 1896, the Nurses' Associated Alumnae of the United States and Canada was formed, becoming the American Nurses Association in 1911. A major goal was to secure legislation to differentiate between trained and untrained nurses (CNA, 1968).

In 1899, Bedford Fenwick founded the **International Council of Nurses (ICN)**, with Britain, Germany, and the

United States as member organizations. Nations without national nursing organizations could not become members. Although Canada did not yet have a national nursing organization, Mary Agnes Snively was elected the first honorary treasurer of the ICN in 1899 (CNA, 1968). This international organization of nurses that emerged from nurses' concerns about registration has remained strong over more than a century and continues to champion important nursing and health care issues (Lynaugh & Brush, 1999).

The Origins of the Canadian Nurses Association and Provincial Nursing Associations

The Canadian Society of Superintendents of Training Schools for Nurses was formed in 1907. The next year, the Provisional Society of the Canadian National Association of Trained Nurses (CNATN) was formed. Mary Agnes Snively served as founding president of both organizations (CNA, 1968). Membership in this new national organization was through affiliated societies in the provinces. At the ICN meeting in 1909, Canada became a full-fledged member of the organization. Later, the CNATN streamlined its organization when registration of nurses was established through legislation in each province. Its name was changed to the *Canadian Nurses Association*



Figure 3-4 Victorian Order of Nurses badge, Edmonton, Alberta, 1927. **Source:** Glenbow Archives, NC-6-12085.

(CNA) in 1924, and it became a federation of provincial associations in 1930.

The struggle for women's rights helped nurses to secure laws to regulate their profession. Nurses formed provincial nurses' associations and sought legislation that would set educational standards and improve nursing care. The first province to gain legislation was Nova Scotia, where a voluntary registration act was passed in 1910. It also allowed nongraduate nurses to register. Initial acts passed in other provinces contained more restrictive standards. Admission criteria and curricula were set for nursing schools, as were rules governing the registration and discipline of practising nurses.

All provinces and two territories eventually secured mandatory registration, requiring that all practising nurses register with the regulatory body approved by the provincial nursing act (Canadian Institute for Health Information, 2006). The distinguishing feature of mandatory rather than permissive legislation is a statute containing a definition of the scope of nursing practice and protecting the use of the title of *registered nurse*. Permissive legislation only protects the title of *registered nurse* (Wood, 2011). Licensure laws are designed to protect the public against unqualified and incompetent practitioners.

The First University Programs

The devastating consequences of World War I and the influenza pandemic of 1918 led to support for public health programs and new patterns of health care delivery. Community health care was promoted, and nurses were seen as central participants who needed university-level education. To this end, the Canadian Red Cross Society awarded grants to a number of Canadian universities to develop postgraduate courses in public health nursing: University of Toronto, McGill University, University of British Columbia, University of

Alberta, Dalhousie University, and University of Western Ontario (Canadian Red Cross Society, 1962).

The first Canadian undergraduate nursing degree program was established at the University of British Columbia in 1919, with Ethel Johns as director. The operating costs of the new department were to be borne by the hospital, an incentive for the university to support the program. The program was nonintegrated—that is, “the university assumed no responsibility for the two or three years of nursing preparation in a hospital school of nursing” (Bonin, 1976, p. 7).

Several new five-year, nonintegrated degree programs began at Canadian universities in the 1920s and 1930s: the University of Western Ontario, the University of Alberta, l'Institut Marguerite d'Youville, the University of Ottawa, and St. Francis Xavier University.

Health Care and Educational Reform

The Weir Report

Program quality became an important concern from the time of the rapid development of nursing education programs in hospitals. The system of nursing education that evolved placed a low priority on the education of women in society. To this day, there are strong elements of a feminist struggle against traditional views on the education of women in the drive to improve standards and quality in nursing education. Nursing students were exploited in the apprenticeship system of nursing education that developed in hospital-based diploma nursing programs. Ending exploitation and ensuring that the goal of nursing programs was the education of the student became causes championed by nursing educators over most of this century. In the 1920s and 1930s, nursing leaders argued for a standard curriculum and for allowing programs to be operated only by hospitals that had enough beds to ensure that schools had the clinical and material resources to support a strong nursing education program. In 1932, Dr. George Weir reported the results of the first national study of nursing education (Weir, 1932). This study was commissioned jointly by the CNA and the Canadian Medical Association (CMA) and confirmed nursing educators' worst fears, that conditions in nursing schools were deplorable, that the health of students was being compromised, and that education was secondary to hospital service as a priority in schools (CMA et al., 2004).

The Royal Commission on Health Services of 1964

Preparing a sufficient number of graduate nurses became the rallying cry of the 1940s, both during the war and throughout the late 1940s and the 1950s. In the expansionist years of the 1960s, nursing leaders called for better prepared faculty in schools and for quality and standards as priorities in nursing education programs. Existing nursing-degree programs began to expand, and new programs emerged in other universities. The basic integrated degree model became the program of choice by the 1970s, as the Royal Commission on Health Services (1964) castigated universities for granting degrees for work over which they had no control, namely the three-year apprenticeship-based hospital diploma program that was “sandwiched” between two years of university study in most nonintegrated baccalaureate degree programs.

The demand for the transfer of responsibility for nursing education to the general educational system that had begun in earnest with the Weir Report of 1932, was heightened by experiments with two-year programming in the 1950s, when the

Demonstration School was established in association with the Metropolitan General Hospital in Windsor, Ontario. Made possible by a grant from the Canadian Red Cross Society, this experimental school was deemed successful in an evaluation of the project (Lord, 1952). The rallying cry of the reformists began to be heard in the 1960s, and the movement to separate nursing education programs from the authority of hospitals began in earnest. Two-year programs in nursing began to appear, and Ontario, Quebec, and Saskatchewan developed a system of diploma education based entirely in community colleges. This transfer of diploma programs to the general education system was in full swing when the Alberta Task Force on Nursing Education recommended in 1975 that all new graduates be prepared at the baccalaureate level before entering professional practice. The position was endorsed by the Alberta Association of Registered Nurses in 1976 and was approved by the CNA in 1982 with a target date of the year 2000. By 1988, when the New Brunswick Association of Registered Nurses endorsed the position, all provincial associations had declared their support (CNA, 1991). Most provincial and regulatory bodies have now made the baccalaureate degree a requirement for the practice of nursing (CNA & Canadian Association of Schools of Nursing, 2004).

Canadian Nurses Association Reports

As late as 1965, the CNA found that 105 out of the 161 hospital schools of nursing participating in the School Improvement Program reported that the selection of clinical assignments was not based on the students' educational needs, but on the service needs of the patient care units (CNA, 1965). Many persistent problems were identified by those who surveyed nursing education in Canada. Helen K. Mussallem found that hospital schools of nursing used their students as a workforce, that hours on duty were too long, that nursing instruction in the classroom was limited and insufficient, and that teaching personnel were ill-prepared and too few in number. The entrenchment of the hospital-based system of nursing education carried with it certain features that nurses considered to be undesirable, and improving standards of education in the schools thus became a primary preoccupation of the professional association for many decades.

Direct clinical experience was the method of choice for educating students to care for hospital patients. Since service took priority over education in the hospital schools, clinical experiences tended not to be planned with the learning needs of the student in mind. Thus, students often performed tasks repetitively and did not have the needed instruction to assist them to understand the complexities of the care they were expected to give. In schools of nursing associated with small hospitals, the range of experience needed for a well-rounded educational experience was just not available. In other schools, students were expected to work very long hours to provide the staff to meet the service requirements of the hospital, and all too often, this had an adverse effect on their health. The system of nursing education embodied in the hospital school had many proponents who argued the merits of apprenticeship as a form of learning. However, as Paul has noted, "for most of the century, the lack of nursing instructors and of other graduate nurses on patient care units meant that there were few role models for students for observation, questions and general discussion. In most cases senior students were left in charge of teaching junior students and this with very limited supervision" (Paul, 1998, pp. 133–134). It can be argued that nursing students were

not under a true apprenticeship program since there were no masters guiding the novices (Chapman, 1969, p. 528).

Baccalaureate Entry-to-Practice

The entry-to-practice position stipulated that all new graduates in nursing must be qualified at the baccalaureate level when they entered the professional practice of nursing. The year 2000 was initially set as a goal for implementation. Although this position originally was put forward by a government committee in Alberta in 1975, it became a highly valued goal of the nursing profession across the country in less than a decade. When nursing organizations put forward their statements supporting the position, they hoped that the position would become a reality by the expected date. At the same time, they recognized from the outset that achieving the position would be unlikely by the year 2000. It was simply a target date to assist with moving toward the goal. Contrary to what many believed, the position never had any kind of legal or political mandate. The reluctance of provincial governments over two decades to endorse the baccalaureate standard for entry to the practice of nursing reflected the fact that equality in education for women in nursing did not come easily. The announcement by the Premier of New Brunswick in 1992 that the baccalaureate degree should be a prerequisite to the practice of nursing was the first such endorsement by a first minister of a Canadian province (Nurses Association of New Brunswick, 1992). Implementation of the baccalaureate standard occurred first in Prince Edward Island in 1992, but would not have been the case without the strong support of its provincial government. Slowly but surely other provincial governments endorsed the position and made adjustments in the capacity of their provincial degree-granting nursing education programs to accommodate all students studying nursing at the undergraduate level. Although all provinces have now achieved baccalaureate entry to practice, the incredible struggle to achieve this goal by nurses should be recognized.

Influence of Periods of Social Upheaval on Nursing

Public Health, Military Conflicts, and the Emergence of University Nursing Education

The struggle for social equality, which became a rallying cry for women in the first quarter of the twentieth century, also took hold on the prairies, where the energies of women and men alike were required to work the land and to provide the services that were necessary in a frontier milieu. Women in western Canada became seriously involved in commenting on needs in health and education and developed organizations to put forward their ideas. Five Alberta women, Nellie McClung, Emily Murphy, Henrietta Muir Edwards, Louise McKinney, and Irene Parlby, pressed forward with "the persons case," petitioning the Supreme Court of Canada and ultimately the Privy Council of Great Britain to declare that women were "persons" and as such could be elected to public office. Education had long been viewed by women as a means of surmounting perceived inequities in society. This was also true in nursing as confirmed by Baumgart and Kirkwood (1990): "Nursing within the university metaphorically represents the struggle of women to have their experience and knowledge validated and legitimized, and their professional expertise recognized as a university discipline" (p. 510).

The impetus for the introduction of nursing programs to the university was the perceived need for additional and highly capable nursing staff for public health work. In the aftermath of World War I, the impact of casualties and disability led to new value being placed on promoting and maintaining health. The devastating consequences of the war along with those of the worldwide influenza epidemic of 1918 and 1919 led to support for public health programs and new patterns of health care delivery to prevent disease and improve the health and well-being of the Canadian populace. The health of mothers and children was seen as particularly critical to the nation because nurturing the health of the young was believed to raise the likelihood that the adult population of the future would be healthier than that of the past. In the new movement to promote health in the community, nurses were seen as central players with a need for additional, university-level preparation for their work.

Because of the above issues, the Canadian Red Cross Society became a partner in establishing the League of Red Cross Societies and in planning an international program for peace-time activity in public health: "It was decided that there should be a great worldwide public health organization to help bring up the standards of physical and mental fitness of the world . . . the promotion of health, the prevention of disease and the mitigation of suffering throughout the world" (Gibbon & Mathewson, 1947, p. 342). This organization served as a catalyst for the development of university programs in nursing. A national committee was formed with representatives from the Canadian National Association of Trained Nurses, the Canadian Red Cross Society, and the St. John Ambulance Association, and they endorsed the following resolutions on September 10, 1919:

That the Central Council of the Canadian Red Cross Society should approach the universities with a view to the establishment of Nursing Departments, and that this action should be followed up by the Provincial Branches which should receive copies of the correspondence between the Head Office and the university; . . . That the adoption of the above policy should entail grants-in-aid to the universities establishing such courses. . . . (Canadian Red Cross Society, 1962, p. 96)

This was followed by three-year grants from the national organization of the Canadian Red Cross Society to six Canadian universities for the development of postgraduate courses in public health nursing. The Red Cross Society first directed its efforts to providing funds for the provision of facilities for postgraduate instruction in public health nursing "by subsidizing special courses for three years at the Universities of Toronto, McGill, British Columbia, Alberta, and Dalhousie" (Gibbon & Mathewson, 1947, p. 342). A Red Cross grant to the University of Western Ontario came from the provincial rather than the national organization.

When the first course in public health nursing was offered at the University of Alberta in 1918 shortly after the establishment of the Public Health Nursing Service, it became the first nursing program offered by a university in Canada: "The appointment of Public Health Nurses was a prominent item . . . on the above mentioned programme. Miss Christine Smith being appointed as superintendent, and four graduate nurses. Misses Sargent, Davidson, Clark and Thurston were engaged as field nurses. These, after receiving special training at the University, and from specialists along public health lines, were

placed at different points through the province" (Department of Public Health Nursing, 1918).

This course was of two months' duration and began on April 1, 1918 (Stewart, 1979, p. 10). A second course was held in 1919; a third in 1921. The *Public Health Nurses' Act*, passed in 1919, formalized the program and designated the University of Alberta as the institution offering the course, specifying that it would lead to a certificate or diploma, and authorized the graduate to "affix after her name the letters 'PH'" (Revised Statutes of Alberta, 1919, p. 793). The Act provided that

(1) There shall be established in connection with the Provincial University a special course of study for nurses. (2) The said course shall include sanitation, personal hygiene, bacteriology, public health, examination of eye, ear, nose throat and teeth, the pre-natal period, infant welfare, child welfare, inspection and instruction of school children, communicable diseases, preventive medicine and methods, and such other studies as from time to time the Senate of the University may prescribe. (Revised Statutes of Alberta, April, 1919, Section 38, p. 793)

From the Depression to the Post-World War II Years

The Great Depression "brought unemployment and hardship to nurses" (Allemang, 1974, p. 172). Patients could no longer afford to employ private-duty nurses, which had been the most promising area of employment for graduate nurses (Gunn, 1933). During the Depression, Canadian universities faced reduced revenues, staff layoffs, and difficult working conditions. The Depression was especially hard on McGill University, which depended on funds from private sources. During the Depression, raising private funds became next to impossible. Leaders of McGill's nursing school had fought unsuccessfully for years for a degree program. Once the university's finances began to deteriorate, the board of governors threatened to close the school altogether. The school's director, Bertha Harmer, gave up her salary, the faculty bought books for the library, and nursing alumnae groups all over the country raised funds to ensure the survival of the McGill nursing school (Tunis, 1966).

During World War II, health education again became a priority as doctors and nurses were needed to care for military personnel, as well as civilians. Nurses who held critical positions as administrators, supervisors, teachers, and public health nurses were recruited for military service and left their positions. A shortage of nurses soon developed. During and after the war, a new interest in nursing education led to increased external university funding, more scholarships and bursaries from private foundations, the growth of existing schools, and the founding of new programs between 1941 and 1949. Programs were initiated at Queen's, McMaster, Manitoba, Mount Saint Vincent, and Dalhousie universities. At McGill, new funds flowed in, and in 1944, supporters of the school were rewarded with a five-year nonintegrated degree program. Most nonintegrated programs offered a two- to three-year apprenticeship-based hospital diploma program sandwiched between two years of university study. The nonintegrated degree pattern with its stepladder approach to nursing education was well established, and the hospital programs on which this approach depended had been entrenched for many years. However, the new interest in nursing education led to exciting innovations. In 1942, the University of Toronto introduced an integrated basic degree program. Under the leadership of Edith Kathleen Russell (see Chapter 4),

courses in arts and sciences were taught concurrently with nursing courses to enhance student development. Also, university instructors supervised student clinical practice in the health care agencies. Four years after the introduction of the University of Toronto basic degree program, a second basic degree program was developed at McMaster University under Gladys Sharpe's direction.

Emerging From Economic and Military Crises

In the 1960s, existing nursing degree programs expanded, and new programs emerged in other universities. The first master's degree program in nursing was established at the University of Western Ontario in 1959, followed in the 1960s and 1970s by similar programs in universities across the country. In 1962, the Canadian Nurses Foundation was established as an entity separate from the CNA, to provide scholarships, bursaries, and fellowships for graduate study in nursing.

Nursing schools' financial dependence left them at the mercy of hospital administrators. As noted above, the lack of instructors and nurses on patient wards meant that it was senior students who were typically given the responsibility to teach junior students (Paul, 1998). Many authorities have suggested that this was not a true apprenticeship model because it lacked the "master craftsman" to guide the students (Chapman, 1969).

Nursing leaders called for better faculty preparation, more integrated programs, and more university-based opportunities for students, such as student placements and increased enrollments. The movement to separate nursing education programs from the authority of hospitals began in earnest, particularly after the aforementioned studies on nursing education, conducted in the early 1960s, identified persistent problems.

Universities resisted introducing basic integrated degree programs because of the costs associated with the low student-teacher ratios required for clinical nursing. It was cheaper for them to let hospitals finance clinical education, but this meant that universities granted degrees for work over which they had no control. In 1964, the Royal Commission on Health Services castigated universities for this practice. By the late 1960s, the basic integrated degree program modelled on the program at the University of Toronto finally became the prototype for the establishment of integrated programs in nursing in universities across the nation.

Throughout the 1970s and 1980s, university faculties and schools of nursing developed research resources so that they could offer graduate programs first at the master's level and then at the doctoral level. The first doctoral nursing program was established at the University of Alberta Faculty of Nursing on January 1, 1991, and others quickly followed.

The CNA has developed a position statement on promoting nursing history (CNA, 2008), noting that learning from the lessons of history is "critical to advancing the profession in the interests of the Canadian public." This statement outlined the responsibilities of nurses across the whole gamut of roles and settings to promote nursing history.

Nursing Education Today

With continuing expansion of health care knowledge and technology, beginning practitioners require a broad educational foundation. New curricula and collaborative baccalaureate programs across the country attest to the profession's commitment to maintaining high standards of health care and responding to society's changing health care needs. The

Internet, computerized learning programs, shared faculty through teleconferencing, and weekend and evening courses provide practising nurses with many options to complete degrees. The CNA's nursing portal, NurseOne, has made database information available to nurses across the country. Some universities have innovative programs at the baccalaureate level, including accelerated programs in which candidates hold a baccalaureate degree in other fields. Baccalaureate programs, master's degree programs, and some courses in doctoral programs are also offered through distance education.

Standards for nursing education are monitored by each province to ensure that educational programs are of appropriate quality and respond to changes in health care. As professionals, nurses must acquire, maintain, and continuously enhance the knowledge, skills, attitudes, and judgement necessary to meet patient needs in an evolving health care system. The responsibility for educational support for competent nursing practice is shared among individual nurses, professional nursing organizations, educational institutions, and governments (Wood, 2011).

The need for nurses with graduate degrees is rising, along with the need for research. A master's degree in nursing is necessary for nurses seeking positions as clinical nurse specialists, nurse practitioners, nurse administrators, or nurse educators. Most master's programs in Canada now offer a concentration in advanced nursing practice for clinical nurse specialists and nurse practitioners. This provides advanced preparation in nursing science, theory, and practice, with emphasis on evidence-informed clinical practice. Nurses with doctorates can undertake research that advances knowledge and evidence-informed practice in clinical settings (see Chapter 6). This research enhances the quality of nursing care and improves Canadians' health outcomes. Today, there are 30 master's programs and 12 doctoral programs in nursing in Canada.

Conclusion

Organized nursing has been a part of the social setting in Canada since the early days of the European settlement at Quebec, a period of more than three and a half centuries. The first nurses who came to found hospitals and provide care for Aboriginal people and settlers were motivated by altruism and serve as excellent role models for nurses today. Altruism, a hallmark of any profession, remains an important characteristic of the nursing profession despite vast differences between health care settings of the early days and those of today.

A fundamental and guiding principle of the French-Canadian hospitals that survived largely intact into the twentieth century was that care was available to all people regardless of their background, status in life, or ability to pay. This continues to be a principle for which nurses, through their **professional organizations**, groups with informal and/or legal authority to represent the nursing profession, have argued determinedly in national debates on the nature and continuing direction of Canada's national health care insurance program. In the presence of pressure to reshape Medicare, nurses have continued to strongly resist calls for privatization of more aspects of the health system. They have also repeatedly called for all health care providers to be remunerated on a salary or contract basis (Ross-Kerr, 2011).

Multidisciplinary teams are an integral component of the health care organization in the community. However, nurses are the primary health care providers both in home care and

in community health settings. Thus, expanded and enhanced educational systems for nurses that incorporate knowledge and skills for community health and home care nursing are essential to meet the health needs of the populace today.

The transformation of the nursing profession and of the educational programs that have supported it since the nineteenth century has been truly remarkable. Despite monumental obstacles, nurses have demonstrated the value of their service, the integrity of their goals, the quality of their educational programs, and the strength of their commitment. Although developments through the twenty-first century are as yet unknown, it is certain that the nursing profession will continue to evolve in the interest of providing a high quality of nursing care to the populace.

❖ KEY CONCEPTS

- Nursing has responded to the health care needs of society, influenced over time by economic, social, and cultural factors.
- Nursing in Canada is rooted in the traditions of good nursing that developed in New France.
- Florence Nightingale revolutionized nursing as an acceptable profession for women as lay nurses in the late 1800s and early 1900s.
- The development of a system of nursing education in Canada emerged from the early nursing sisterhoods and from schools of nursing associated with hospitals.
- Baccalaureate entry to practice has been fully implemented in Canada.
- Basic nursing education is acquired in college, collaborative college-university, or university programs.
- The ranks of the profession are moving toward gender balance and a racial, ethnic, and cultural mix that reflects the Canadian population.

❖ CRITICAL THINKING EXERCISES

1. Explain the importance of Florence Nightingale's work to establish nursing as a profession.
2. Identify some of the enduring values that have emerged from the history of nursing in Canada.
3. Observe various levels of nursing practice, such as a staff nurse, nurse practitioner, and nurse educator. Identify similarities and differences in their roles and educational preparation.
4. Outline some career objectives for yourself after completing your nursing program. Think about what you want to do as a professional nurse, and then outline strategies for achieving these goals.

❖ REVIEW QUESTIONS

1. The founder of modern nursing is
 1. Hippocrates
 2. Florence Nightingale
 3. Jeanne Mance
 4. Mary Agnes Snively
2. The founder of the Sisters of Charity of Montreal, which later became known as the Grey Nuns, is
 1. Marie Rollet Hébert
 2. St. Vincent de Paul
 3. Marguerite d'Youville
 4. Lady Ishbel Aberdeen

3. The first doctoral nursing program in Canada was established in
 1. 1890
 2. 1933
 3. 1975
 4. 1991
4. Nurse practitioners in Canada
 1. Work in university health settings
 2. Are able to function independently
 3. Are licensed under nursing legislation in jurisdictions
 4. Function as unit directors in health agencies
5. Nursing has a code of ethics that professional registered nurses follow, which
 1. Defines the principles of nursing care
 2. Ensures identical care to all patients
 3. Protects the patient from harm
 4. Improves self-health care
6. Which of the following is *not* a function of a professional nursing organization?
 1. Regulating registration and professional conduct
 2. Monitoring unregulated care providers
 3. Collaborating with other health care organizations on matters of mutual interest
 4. Establishing standards of education and professional practice
7. The practice of nursing is regulated by
 1. The CNA
 2. Nursing practice acts
 3. Best practice guidelines
 4. Hospital administrators
8. Except for Ontario and Quebec, minimum standards for nursing education are set by
 1. The nursing school
 2. The provincial or territorial nursing association
 3. The Canadian Nurses Association
 4. The Canadian Nurses Federation
9. A role of a nursing union is to
 1. Devise ethical standards to guide practice
 2. Set the standards of practice for nursing
 3. Represent nurses in bargaining for new contracts
 4. Carry out registration and licensure

❖ RECOMMENDED WEB SITES

Canadian Association for the History of Nursing (CAHN): <http://www.cahn-achn.ca/>

An affiliate group of the CNA, the CAHN offers information about Canadian nursing history and promotes historical research.

Canadian nursing organizations: <http://www.canadianrn.com/directory/assoc.htm>

This site offers a list of current Canadian nursing organizations, including contact information.

Review Question Answers

1. 2; 2. 3; 3. 3; 4. 4; 5. 1; 6. 2; 7. 2; 8. 2; 9. 3

Rationales for the Review Questions appear at the end of the book.

4

Community Health Nursing Practice

Written by Kaysi Eastlick Kushner, RN, PhD

objectives

Mastery of content in this chapter will enable you to:

- Define the key terms listed.
- Explain the relationship between community health nursing and primary health care.
- Discuss the roles and functions of the community health nurse.
- Differentiate between public health nursing and home health nursing.
- Explain the characteristics of clients from vulnerable populations that influence a nurse's approach to care.
- Describe the standards, competencies, roles, and activities important for success in community health nursing practice.
- Describe elements of a community assessment.

key terms

Community, p. 44	Population health, p. 45
Community-based nursing, p. 45	Primary health care, p. 44
Community health nursing, p. 44	Public health, p. 45
Community health nursing practice, p. 44	Public health nursing, p. 45
Empowerment, p. 44	Public health principles, p. 45
Harm reduction, p. 49	Social justice, p. 44
Home health nursing, p. 45	Vulnerable populations, p. 47
Population, p. 44	

media resources

evolve WEBSITE

<http://evolve.elsevier.com/Canada/Potter/fundamentals/>

- Audio Chapter Summaries
- Examination Review Questions
- Glossary
- Student Learning Activities
- Weblinks

Today's health care climate is rapidly changing in response to economic pressures, technological and medical advances, and client participation in health care. As a result, many clients are receiving care in the community rather than in hospital. There is a growing need to deliver health care where people live, work, and learn (Community Health Nurses of Canada [CHNC], 2011). Community health nursing care focuses on health promotion and protection, disease and injury prevention, and restorative and palliative care. The goals of community health nursing are to keep individuals healthy, encourage client participation and choice in care, promote health-enhancing social and physical environments, and provide in-home care for ill or disabled clients.

Promoting individual and community health has always been key to the holistic practice of nursing. In the 1730s, the Grey Nuns were established as Canada's first community nursing order. More than a century later, in England, Florence Nightingale articulated a nursing

► BOX 4-1 Milestones in Canadian Nursing History



Kate Brighty Colley, 1883–1985

Born in England in 1883, Kate Brighty immigrated with her parents to Nova Scotia at the age of three years. She graduated from the Royal Alexandra Hospital School of Nursing in Edmonton in 1917, after which she enlisted with the Canadian Army Medical Corps in Calgary.

After completing a course in public health nursing at the University of Alberta in 1919, Brighty was one of the first nurses to be appointed to the staff of the new Alberta Department of Public Health. Soon afterward, the Alberta Department of Agriculture engaged her to teach home nursing, bedside care, and hygiene in Grande Prairie.

In the same year, Brighty was appointed matron of the second municipal hospital in Alberta, the Mission Hospital at Onoway. Because there were no physicians in the region, she and her two employees staffed the hospital and visited rural patients on horseback. In 1923, she returned to the Department of Public Health to establish a district nursing centre at Buck Lake, southwest of Edmonton, an area that had no roads at the time, and then another centre, farther north at Wanham, near the Peace River. Here, she travelled by cutter to assist women in labour and those who were ill.

In 1925, Brighty took a postgraduate course in public health nursing at Columbia University, New York. Upon her return to Alberta in 1928, she was appointed director of the Department of Public Health Nursing. Her responsibilities were expanded a year later to include the post of inspector of hospitals. In her new post, Brighty established a number of new district nursing centres. As a former district nurse, she understood the problems these nurses faced, and she travelled widely to visit staff. She expanded the health education program and gave radio talks on health, hygiene, nutrition, and child welfare. These broadcasts were important to residents of remote areas, where little formal health care was available.

Brighty was active in the Alberta Association of Registered Nurses (AARN) and, in 1936, was elected president of the organization. She wrote the first history of nursing in Alberta, the *AARN Blue Book* (Brighty, 1942).

After 24 years of service to the Department of Public Health Nursing, she retired in 1943 to Vancouver Island, and in 1970, she published *While Rivers Flow: Stories of Early Alberta*, experiences and short stories based on her public health nursing practice.

Sources: Brighty, K. (1942). *Collection of facts for a history of nursing in Alberta: 1864–1942*. Edmonton: Alberta Association of Registered Nurses; and Brighty Colley, K. (1970). *While rivers flow: Stories of early Alberta*. Saskatoon: The Western Producer; and Stewart, I. (1979). *These were our yesterdays: A history of district nursing in Alberta*. Altona, MB: Friesen Printers.

► BOX 4-2 Milestones in Canadian Nursing History



Edith Kathleen Russell, 1886–1964

Edith Kathleen Russell was born in Windsor, Nova Scotia, in 1886. She entered the Toronto General Hospital School of Nursing in 1915 and, after graduating, worked with the Department of Public Health in Toronto. In 1920, the Department of Public Health Nursing at the University of Toronto was established, and Russell was appointed its first director.

Russell recognized the great need for improved nursing education. At the time, the norm was an apprenticeship system in hospital schools, in which students, rather than graduate nurses, fulfilled nursing tasks. The primary focus of the hospital school system was not education but hospital service; the incentive was mainly financial. Although public health nursing was her department's original focus, Russell turned her attention to hospital nursing. She gained the

support of the University of Toronto and the Rockefeller Foundation for an experiment in basic nursing education and obtained a grant of more than \$250,000. This was at the height of the Great Depression, when other university schools were fighting for their very existence.

Russell's diploma program, begun in 1933, prepared nurses for hospital and public health nursing. In 1942, her program evolved into an integrated basic degree program controlled by the university, in which clinical practice was obtained at affiliated hospitals under supervision of university instructors. This program was the first of its kind in Canada and was hailed throughout the world as an important new system of nursing education. Today, hospital-based schools of nursing have largely given way to schools in the general educational system, either in community colleges or in universities, and most provinces are adopting the degree as the basic credential for nursing practice. Edith Kathleen Russell is widely recognized as the architect of the integrated degree nursing program.

Source: Carpenter, H. (1982). *A divine discontent: Edith Kathleen Russell, reforming educator*. Toronto: University of Toronto Faculty of Nursing. Photo: Reproduced by permission of Helen M. Carpenter (BS, MPH, EdD).

philosophy grounded in knowledge of environmental conditions. By the end of the century, the Victorian Order of Nurses was providing in-home nursing, often in outpost and remote regions. After World War I, community nursing responsibilities "extended to screening programs to detect disease at early stages, to helping to maintain a healthy environment, and to providing nursing care" (Ross-Kerr, 2011, p. 25).

Canadians such as Kate Brighty Colley (Box 4-1) and Edith Kathleen Russell (Box 4-2) pioneered community and public health nursing in Canada. Today, nursing is leading the way in assessing, implementing, and evaluating public and community-based health services needed by clients. Community health nursing is essential for improving the health of the general public.

Promoting the Health of Populations and Community Groups

Nurses practising in the community face many challenges in promoting the health of populations and community groups. A **population** is a collection of individuals who have in common one or more personal or environmental characteristics (Maurer & Smith, 2005). Examples of populations are Canadians inclusively and, more specifically, older adults or a cultural group such as Aboriginal peoples. A healthy population is composed of healthy individuals, and the health status of individuals is considered an overall aggregate that reflects an average or general health status. To determine a population's health status, individual characteristics (such as occurrence of illness, disability, and death; lifespan; education; and living conditions) are considered. A **community** is a group of people who share a geographic (locational) dimension and a social (relational) dimension (Edwards & Moyer, 2000; Laverack, 2004). The social dimension—which comprises individual relationships, interactions among groups, and shared characteristics among members—distinguishes a community from a population. Examples of communities are geographic groupings (e.g., neighbourhoods) and shared-interest groups (e.g., women's health networks). A healthy community consists of healthy individuals engaged in collective relationships that create a supportive living environment. Both individual and community characteristics are used to determine community health status. **Key characteristics of a healthy community** include a collective capacity to solve problems; adequate living conditions; a safe environment; and sustainable resources such as employment, health care, and educational facilities.

Community Health Nursing Practice

The scope of **community health nursing practice** includes population health promotion, protection, maintenance, and restoration; community, family, and individual health promotion; and individual rehabilitation or palliative care. Community health nurses “promote, protect, and preserve the health of individuals, families, groups, communities, and populations” (CHNC, 2011, p. 4). Practice involves coordinating care and planning services, programs, and policies by collaborating with individuals, caregivers, families, other disciplines, communities, and governments. Practice combines knowledge of nursing theory, including the metaparadigm concepts of person, health, nursing, environment, and social justice as a theoretical foundation, social sciences, and public health science (CHNC, 2011). **Social justice** is rooted in notions of societal (social) responsibility and fairness (justice). “Social justice is the equitable, or fair, distribution of society's benefits, responsibilities and their consequences. It focuses on the relative position of social advantage of one individual or social group in relation to others in society as well as on the root causes of inequities and what can be done to eliminate them” (CNA, 2010, p. 13). Social justice encompasses equity, human rights, democracy and civil rights, capacity building, just institutions, enabling environments, poverty reduction, ethical practice, advocacy, and partnerships (CNA, 2010).

Community health nursing includes public health nursing, home health (community-based) nursing, and community mental health nursing, as well as a variety of other specialties such as street health and parish nursing (CHNC, 2011; see also

Stamler & Yiu, 2011, and Stanhope et al., 2011, for in-depth descriptions of community health nursing roles in Canada). Occupational health nursing has emerged as a distinctive specialized practice, although it is arguably within the inclusive focus of community health nursing.

The community health nursing focus is broad, emphasizing both the community's health and direct care to subpopulations within that community. By focusing on subpopulations, the community health nurse cares for the whole community and considers the individual to be one member of a group. The practice focus of different specialties within community health nursing varies: for example, home health nurses focus on individual clients, then broaden their view to consider family and community, whereas public health nurses more often shift from a broad view of populations to narrow their focus to specific vulnerable groups or families (CHNC, 2011).

Regardless of specific role, function, or setting, community health nursing practice is guided by values of caring, principles of primary health care, multiple ways of knowing, individual and community partnerships, empowerment, and social justice (CHNC, 2011). **Primary health care** focuses on education, rehabilitation, support services, health promotion, and disease prevention. It involves multidisciplinary teams and collaboration with other sectors, as well as with secondary and tertiary care facilities (see Chapter 2). Primary health care principles guide community health nurses to use empowerment-based models of community practice (Chalmers & Bramadat, 1996; CHNC, 2011). **Empowerment** may be most simply described as a psychological, cultural, social, or political process by which people, individually and collectively in organizations and communities, exercise their ability to effect change to enhance control, quality of life, political effectiveness, and social justice (Canadian Public Health Association [CPHA], 2010). Empowerment is both an outcome and a process by which that outcome is achieved. Empowerment exists in dynamic power relations among people, which from a health promotion perspective are expressed as “power with” rather than “power over” relations (Labonte, 1993). Although empowerment is commonly conceptualized as a process continuum from personal to small group to community organization to partnership to social and political action (Laverack, 2004), Labonte's holosphere (Venn diagram) better depicts the interrelated and nonlinear dynamic of empowering processes in practice. Criticisms that empowerment is often misinterpreted as increasing individual responsibility but overlooking power and control (Cooke, 2002) highlight the importance of action to ensure that adequate resources are available for individuals and for groups and communities collectively. Such action would be grounded in ethical commitment to inclusion, diversity, participation, social justice, advocacy, and interdependence as a complementary foundation to the Canadian Nurses Association (CNA) *Code of Ethics* intended to guide all nursing practice (Racher, 2007).

Empowerment-based skills of client advocacy, communication, and the design of new systems in cooperation with existing systems help make community health nursing practice effective. The Canadian Community Health Nursing Practice Model (CHNC, 2011) articulates how community health nursing care encompasses actions aimed at illness care; illness, disease, or injury prevention; and health promotion. Nursing actions are guided by approaches oriented to capacity building, participation, collaboration, inclusiveness, equity, social justice, and advocacy. These actions complement one another,

even as their underlying aims, approaches to care, and perceptions of clients may differ.

Community health nursing practice requires a distinct set of skills and knowledge. Expert community health nurses understand the needs of a population or community through experiences with individuals, families, and groups. They think critically in applying a wide range of knowledge to find the best approaches for partnering with their clients. In 2006, the CNA introduced a community health nursing certification (CNA, 2006). Certification confirms practitioner competence in the specialty, recognizes nurses who meet the national standards of the specialty, and promotes excellence in nursing care for the Canadian population (see CHNC [2011] and CNA [2006] for standards and certification procedures).

Public Health Nursing

Public health nursing merges knowledge from public health science, social sciences, and primary health care with professional nursing theories to safeguard and improve the health of populations in the community (CPHA, 2010; CHNC, 2011). To understand public health nursing, it is necessary to know how public health works. The emphasis in **public health** is on the health of the entire population. Historically, government-funded agencies have supported public health programs that improve food and water safety and provide adequate sewage disposal. Public health policy has largely been responsible for the dramatic gain in life expectancy for North Americans during the past century (McKay, 2008; Shah, 2003). The goal of public health is to achieve a healthy environment for everyone. **Public health principles** of disease prevention, health promotion and protection, and healthy public policy (CPHA, 2010) can be applied to individuals, families, groups, or communities. Public health practice calls for competencies (i.e., knowledge, skills, attitudes) that cross the boundaries of specific disciplines and are independent of programs and roles (Public Health Agency of Canada [PHAC], 2007). These competencies include “population health assessment, surveillance, disease and injury prevention, health promotion, and health protection” (PHAC, 2007, p. 1; see also CHNC, 2009).

A public health focus requires understanding the needs of a population. Focus may be narrowed to vulnerable populations (e.g., low-income families, recent immigrants). Public health professionals must understand factors influencing the health promotion and health maintenance of groups, trends and patterns influencing disease or risk occurrence within populations, physical and social environmental factors contributing to health and illness, and political processes used to influence public policy (see Chapter 1, “Determinants of Health”).

The **population health** promotion approach (Hamilton & Bhatti, 1996) provides a framework for thinking about health and taking action to improve the health of populations. Action is directed primarily at community levels. Strategies address the determinants of health in order to improve population health and reduce risks (see Chapter 1). Most health determinants involve other sectors of society such as education, agriculture, business, and government. Multisectoral collaboration between the health sector and other sectors is essential, broadening the scope of nursing practice in the community. Population-based public health programs focus on disease prevention, health protection, and health promotion, which provide a foundation for health care services at all levels (see Chapter 2).

Using public health principles helps public health nurses to understand the environments in which clients live, the factors that influence client health, and the types of interventions supportive of client health. Public health nurses perceive value in their distinctive practice, which enables them to see “the big picture” as a result of their “broad health knowledge base, in depth understanding of the community and community resources, and . . . appreciation of individual– family–community interrelationships” (Reutter & Ford, 1996, p. 8). Figure 4-1 illustrates a framework for public health programs that provides a means of organizing program development in public health practice (Edwards & Moyer, 2000).

Successful public health nursing practice involves empowerment-based strategies initiated by building relationships with the community and being responsive to changes within it (Aston et al., 2009; Baisch, 2009; CPHA, 2010; CHNC, 2011). For example, when increasing numbers of grandparents are caring for their grandchildren in a community, nurses can collaborate with local schools and agencies to create a program that might include an opportunity for peer support and education about available resources. The public health nurse is responsive by being active in the community; knowing its members, needs, and resources; working collaboratively to establish health promotion and disease prevention programs; and advocating for program and public policies that promote health and build capacity to identify and address health issues among individuals, families, communities, and service providers. This means developing and maintaining relationships with other professional systems and individuals and encouraging them to respond to a population’s needs.

Home Health Nursing

Home health nursing, also known as **community-based nursing**, involves acute, chronic, and palliative care of individuals and their families that enhances their capacity for self-care and promotes autonomy in decision making (Ayers et al., 1999; CHNC, 2011). Nursing takes place in community settings such as the home, a long-term care facility, or a clinic. The nurse’s competence is based on critical thinking and decision making at the level of the individual client: assessing health status, selecting nursing interventions, and evaluating care outcomes. Because they provide care where clients live, work, and play, home health nurses need to be individual and family oriented and also need to appreciate the community context (CHNC, 2010).

Components of home health nursing practice include self-care as a client and family responsibility; preventive care; care within the community context; continuity of care between home and health system services; and collaborative client care among health practitioners (CHNC, 2011). Nurses use their clinical expertise to provide direct care (e.g., a case manager monitors clients recovering from stroke and provides rehabilitation services). Nursing supports and improves clients’ quality of life. Illness is seen as one aspect of clients’ everyday lives. Nursing tends to be problem focused, addressing client needs for primary, secondary, and tertiary prevention (CHNC, 2011).

A strong theoretical foundation for home health nursing, and community health nursing broadly, is provided by the human ecological model, which conceptualizes human systems as open and interactive with the environment (Aston et al., 2009; Baisch, 2009; Chalmers et al., 1998). In an ecological model, the individual is viewed within the larger systems of

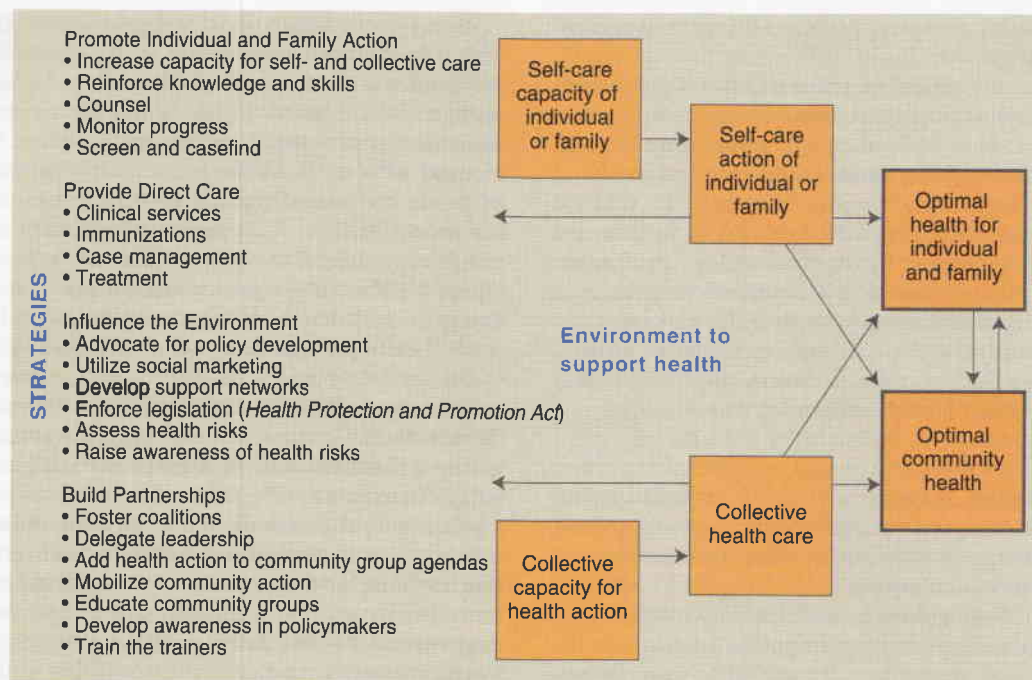


Figure 4-1 Framework for public health programs. **Source:** From N. Edwards et al. (1995). *Building and sustaining collective health action: A framework for community health practitioners*. Ottawa: Community Health Research Unit, Pub. No. DP95-1, as cited by Edwards, N. C., & Moyer, A. (2000). Community needs and capacity assessment: Critical component of program planning. In M. J. Stewart (Ed.): *Community nursing: Promoting Canadians' health* (2nd ed., p. 433), Toronto: W. B. Saunders.

family, social network, community, and society, which can be depicted as four concentric circles: the innermost circle of the client and the immediate family, the second circle of people and settings that have frequent contact with the client and family, the third circle of the local community and its values and policies, and the outermost circle of larger social systems such as business and government (Ayers et al., 1999). A home health nurse must understand the interaction of all systems while caring for clients and families in the home environment. Nurses typically become involved in the domain of the first three circles. For example, as a home health nurse, you work closely with a client recently diagnosed with diabetes and with the family to establish a care plan. You use observations of the client's lifestyle when considering an exercise schedule and meal routines. Knowing community resources (e.g., shops with glucose monitoring supplies, local diabetes support groups) enables you to provide comprehensive support.

Home health nursing is family-centred care (Ayers et al., 1999; CHNC, 2010). This care requires knowledge of family theory (see Chapter 19), cultural diversity (see Chapter 9), communication (see Chapter 17), and group dynamics. Empowerment-based strategies guide you to work in partnership with clients and families (Toofany, 2007), in planning, decision making, implementation, and evaluation of health care approaches.

The Changing Focus of Community Health Nursing Practice

Community health nursing practice has changed since the 1960s in response to social, economic, and political influences. Changes were documented by Chalmers et al. (1998), who interviewed community health nurse educators, administrators, and staff nurses who worked in public health agencies,

home health services, and community health centres in Manitoba. The nurses noted shifts in practice focus from universal programs to programs directed to high-risk or vulnerable groups, from generalized to specialized practice, and from delivery of traditional public health services to more community-based acute care. These shifts resulted in increasing demands on community health nurses to manage more complex care situations. In 2005, Meagher-Stewart et al. reported the practice challenges articulated by public health nurses and nurse administrators in Nova Scotia (Box 4-3), highlighting conditions that undercut their ability to work directly with clients, a highly valued aspect of their practice. The trends identified by Chalmers et al. remain relevant because they reflect continuing shifts and related challenges in community health nursing practice over a decade after they were publicized.

Although many changes are consistent with the principles of primary health care and health promotion, there is concern that some changes put universal accessibility of public health nursing services at risk (Meagher-Stewart et al., 2005). This concern also emerged in home health practice, in which a policy agenda of increasing medicalization "potentially leads to further marginalization of the most vulnerable" (Duncan & Reutter, 2006, p. 242). Home health care case managers expressed concern about limits on their practice arising from a conflict between professional discourse that guides practice and economic discourses that drive organizational priorities (Ceci, 2006). Underwood et al.'s (2009) examination of enablers to public health nursing practice identifies opportunities to enhance capacity to counter current system pressures. They concluded that "community nurses work well together, but need time, flexible funding and management support to strengthen relationships with their communities and clients and to build partnerships with other professionals" (p. I-10).

► BOX 4-3

Challenges to Community Health Nursing Practice

- Pulled between documenting work and valued practice with clients
- Torn between prescribed programs and community partnership activities
- “Never enough time,” especially for higher needs
- Increased task orientation, specialization, and working in silos
- Lack of evaluation of program effectiveness
- Increasing inequity of programs to rural, seniors, and low-income populations
- Feeling stretched related to shortage of nursing and administrative support staff
- Staying current on health information
- Loss of connection and visibility with the community

From Meagher-Stewart, D., Aston, M., Edwards, N., Smith, D., Young, L., Woodford, E., et al. (2005). *The study of public health nurses in primary health care. Fostering citizen participation and collaborative practice: Tapping the wisdom and voices of public health nurses in Nova Scotia*. Research report (p. 6). Halifax: Dalhousie University. Retrieved from http://preventionresearch.dal.ca/pdf/PHN_study_Nov25.pdf.

Vulnerable Populations

Community health nurses care for clients from diverse cultures and backgrounds and with various health conditions. However, because of changes in the health care delivery system, high-risk groups have become the nurses' principal clients.

Vulnerable populations of clients are those who are likely to develop health problems as a result of excessive risks, who experience barriers when trying to access health care services, or who are dependent on others for care. Vulnerability can be understood in relation to the determinants of health, particularly social determinants that compromise socioeconomic status, literacy, and social inclusion (see Chapter 1). People living in poverty, homeless people, people in precarious circumstances (such as women in abusive interpersonal relationships), people with chronic conditions and disabilities, and people who engage in stigmatizing risk behaviours (including substance abuse and unsafe sexual practices), as well as Aboriginal peoples and new immigrants and refugees, are examples of vulnerable populations (Beiser & Stewart, 2005). Vulnerable individuals and their families often belong to more than one of these groups and may live in communities that can be characterized as vulnerable. Frequently, vulnerable clients come from a variety of cultures, have beliefs and values different from the mainstream culture, face language barriers, and have few sources of social support (Chalmers et al., 1998). Their distinctive needs contribute to the challenges that community nurses face.

To provide competent care to vulnerable populations, nurses in community health care practice must be comfortable with diversity as valuable to individual and social well-being. Culture, ethnicity, ability, economic status, gender, and sexual orientation are all aspects of diversity in Canadian society. Comfort with diversity requires more than tolerance of difference, which implies that the dominant culture is the reference point. Chapter 9 addresses factors influencing individual differences within cultural groups and the nurse's role in providing culturally competent and safe care. To be culturally competent and safe, you must be able to understand clients' cultural beliefs, values, and practices in order to work with them to determine their needs and the interventions most

likely to improve their health. You cannot judge or evaluate a client's beliefs and values about health in terms of your own culture. Communication and caring practices are crucial for understanding clients' perceptions and for planning effective, culturally competent and safe health care. You need to be aware of cultural and ethnic determinants of health, differing beliefs about health and medicine among ethnic communities, and barriers to accessing care that affect members of minority or marginalized populations.

Vulnerable populations typically experience poorer health outcomes than people with ready access to resources and health care services (Beiser & Stewart, 2005; Raphael, 2009). Higher morbidity and mortality rates characterize members of ethnically and racially diverse minority groups (Barr et al., 2002; Hwang, 2000). Members of vulnerable groups frequently experience cumulative risk factors or combinations of risk conditions that make them more sensitive to adverse effects of individual risk factors that others might overcome (Raphael, 2009; Rew et al., 2001). Community health nurses must assess clients from vulnerable populations by considering multiple risk factors and the clients' strengths. Box 4-4 summarizes guidelines for assessing clients from vulnerable population groups.

Poor and Homeless People. People who live in poverty are more likely to live in hazardous environments, work at high-risk jobs, eat less nutritious foods, and experience multiple stressors. They often face practical problems such as limited access to transportation, limited quality child care to support employment, and limited medication or dental coverage from supplementary health benefits. Low-income status is prevalent among lone-parent families, unattached older adults (mostly women), and Aboriginal families (Canadian Population Health Initiative, 2004; Raphael, 2009). Homeless people have even fewer resources than do low-income people. Their vulnerability lies in their social condition, lifestyle, and environment, all of which diminish their ability to maintain or improve their health or access health care. Homeless people live on the streets or in temporary accommodation such as shelters and boarding houses. They may distrust health and social services as bureaucratic and judgemental, using them only when their health has deteriorated (Thibaudeau & Denoncourt, 2000). Chronic health problems worsen because of barriers to supportive self-care and medical care. Homeless people have a high incidence of mental illness and substance abuse. Nurses can help low-income and homeless people identify their capacities and resources, their eligibility for assistance, and interventions to help improve their health (Figure 4-2). For example, Cathy Crowe's work as a street nurse in Toronto includes direct care such as “dressing a wound under a highway overpass” and “treating frostbite” as well as advocacy such as “constantly seeking donations like Gatorade to counter dehydration” and “documenting police-inflicted injuries” (Crowe, 2007, p. 6).

People in Precarious Circumstances. Women are at greater risk for problems related to low income, violence, and the stressors associated with unpaid caregiving. Such risks are further complicated for some by geographically isolated settings that challenge women's resilience in maintaining their health (Leipert & Reutter, 2005). Community health nurses' work is guided by their recognition of the need to listen to, respect, and communicate with women in their communities (Leipert, 1999).

Physical, emotional, and sexual abuse and neglect are major public health problems, particularly affecting older adults,

➤ BOX 4-4

Guidelines for Assessing Members of Vulnerable Population Groups

Setting the Stage

- Create a comfortable, nonthreatening environment.
- Learn as much as you can about the culture of the clients you work with, to understand traditions and values that influence their health care practices.
- Provide culturally competent assessment by understanding the meaning of language and nonverbal behaviour in the client's culture.
- Be aware that the individual or family may have priorities, such as financial or legal problems, that, within your scope as a nurse, you may need to help them deal with before specific health concerns can be addressed.
- Collaborate with others as appropriate; connect your client with someone who can help.

Nursing History of an Individual or a Family

- You may have only one opportunity to work with a vulnerable person or family. Try to document a history that provides essential information you need to help on that day. Organize what you need to ask, and be prepared to explain why the information is necessary.
- Use a modified comprehensive assessment form to focus on the distinctive needs of the vulnerable group. Be flexible. With some clients, it is impractical and unethical to ask all questions on the form.
- Include questions about social support, economic status, resources for health care, current health problems, medication, and how the person or family manages their health. Your goal is to obtain information that will enable you to provide family-centred care, work with strengths, and address concerns.

Physical Examination or Home Assessment

- Complete as thorough a physical examination (on an individual) or home assessment as you can. Collect only information you can use to work with the individual or family.
- Be alert for indications of mental or physical abuse, substance use, or differences from expected physical examination findings.
- Observe a family's living environment. Does the family have running water, functioning plumbing, electricity, and access to a telephone? Is paint peeling on the walls and ceilings? Are room ventilation and temperature adequate? Is the home next to a busy highway, exposing the family to high noise levels and automobile exhaust?

Adapted from Sebastian, J. G. (2006). Vulnerability and vulnerable populations: An overview. In M. Stanhope & J. Lancaster (Eds.), *Foundations of nursing in the community: Community-oriented practice* (pp. 403–417). St Louis, MO: Mosby.

women, and children (CPHA, 1994; Sebastian, 2006). Abuse occurs in many settings, including the home, workplace, school, health care facility, and public areas, and is most often committed by an acquaintance of the victim (CPHA, 1994). When dealing with clients at risk for or who may have suffered abuse, you must provide protection for them. Interviews with clients should occur in private when the individual suspected of being the perpetrator is not present. Clients who have been abused often fear retribution if they discuss their problems with a health care provider. Most regions have reporting agencies or hotlines for notification when an individual has been identified as being at risk, and you can work with clients to



Figure 4-2 Nursing students working in a Care Bus to provide basic health care to the homeless population.

reflect on concerns, identify acceptable alternatives, and make decisions about their situation.

Unintentional injuries, unemployment, depression, and suicide are a concern among youth, particularly young men and those in Aboriginal communities. “Community health nurses who are concerned with adolescent health promotion must consider the broad range of factors that affect adolescent health decisions and behaviours. Individual, family and environmental factors must be considered, together with many structural and societal factors” (Gillis, 2000, p. 257).

A focus on how the physical environment influences health has re-emerged as a priority for community health nurses, reflecting increasing public concerns about potential exposure to hazardous physical environments. These environments include natural and built environments. The quality of the built environment of daily life—dwellings, schools, workplaces, and community spaces—has an impact on individual and community health. Environmental racism, documented in “communities of colour” who experienced disproportionate exposure to hazardous waste facilities, landfills, and incinerators (Cole & Foster, 2001), is a form of environmental injustice, encompassing racial and class-based discrimination that underpins such exposures in marginalized communities. An environmental justice perspective can support action to address inequitable distribution of health-promoting amenities, such as walkable neighbourhoods and park space, and of hazardous exposures, such as unsafe housing, toxic industrial sites, and polluted ground waters (Cutts et al., 2009).

People with Chronic Conditions and Disabilities. “Chronic conditions are impairments in function, development, or disease states that are irreversible or have a cumulative effect” (Ogden Burke et al., 2000, p. 211). There are physical and emotional aspects of living with chronic conditions. Societal trends toward greater family mobility, maternal employment, smaller families, and female-headed, lone-parent, low-income families are challenges for families caring for children with chronic conditions (Ogden Burke et al., 2000). Older adults experience more chronic conditions as they age (Denton & Spencer, 2010). The shift in health care service delivery from institutional to community-based care places demands on families, particularly women, to provide caregiving in the community. You need to work with individuals, families, and

communities to promote adequate support for family caregivers and access to resources and services.

For a client with a severe mental illness, multiple health and socioeconomic problems must be explored. Many such clients are homeless or marginally housed. Others are unable to work or provide self-care. They require medication therapy, counseling, housing, and vocational assistance. No longer hospitalized in long-term psychiatric institutions, clients with mental illness are offered resources within their community. However, many communities face continuing difficulties establishing comprehensive, coordinated, and accessible service networks (Health Canada, 2002; Shah, 2003). Many clients who lack functional skills are left with fewer, more fragmented services.

Collaboration among community resources is key to helping people with mental illness obtain health care. For example, the interdisciplinary Psychiatric Outreach Team of the Royal Ottawa Hospital provides mobile services to shelters and drop-in centres to initiate mental health care, assist in linking clients to community resources, and provide education and assistance in connecting with mental health and addiction treatment (Farrell et al., 2005).

With the increasing population of older adults, there is a corresponding increase in the number of clients with chronic disease and a greater demand for health care (Craig, 2000). You must view health promotion from a broad perspective, by understanding what health means to older adults and ways they can maintain their own health. Among individuals who feel empowered to control their own health, the incidence of disability from chronic disease is lower (Baas et al., 2002). You can help improve the quality of life for older adults.

People Who Engage in Stigmatizing Risk Behaviours. Potentially stigmatizing risk behaviours include substance abuse and unsafe sexual practices. The social determinants of health provide a holistic perspective to address social and structural conditions that influence behaviour and to challenge the “unprecedented reliance on interventions that focus on addressing what is wrong with the individual” (Shoveller & Johnson, 2006, p. 56). Substance abuse is a general term for the use of illegal drugs and the abuse of alcohol and prescribed medications such as anti-anxiety agents and narcotic analgesics. Clients who abuse substances also frequently have health and socioeconomic problems. A substantial proportion of adult HIV and AIDS cases have been attributed to injection drug use (Geduld & Gatali, 2003). Substance abuse, particularly alcohol abuse, remains a serious problem among Canadian adolescents (Gillis, 2000; Health Canada, 2007; Leatherdale & Ahmed, 2010). Socioeconomic problems often result from financial strain, employment loss, and family breakdown. The incidence of unsafe sexual practices and multiple risk-taking behaviours remains high among young people (Smylie et al., 2006). Unsafe sex creates serious health and social risks, including the risks of unplanned pregnancy and acquiring sexually transmitted infections (e.g., HIV infection and AIDS). Unplanned adolescent pregnancy poses risks for both mothers and infants, including pregnancy complications (DiCenso & Van Dover, 2000), low income, low academic achievement, unemployment, violence (Gillis, 2000), and stigma (Fulford & Ford Gilboe, 2004). You can partner with clients to assess the circumstances that contribute to substance use, unsafe sexual practices, and other risk behaviours and identify strategies to address the often multiple and inter-related concerns. For example, Steenbeek (2004) identified strategies such as peer leader training and self-advocacy skill

development within an empowering health promotion framework to prevent sexually transmitted infections among Aboriginal youth. The AIDS Prevention Street Nurse Program (Box 4-5) and the Nursing Story (Box 4-6) illustrate **harm reduction**, an important but controversial approach to health promotion that is based on user input and demand, compassionate pragmatism, and commitment to offer alternatives to reduce risk behaviour consequences, to accept alternatives to abstinence, and to reduce barriers to treatment by providing user-friendly access (Hilton, Thompson, Moore-Dempsey, & Janzen, 2001; Pauly et al., 2007; Shah, 2003).

BOX 4-5 RESEARCH HIGHLIGHT

AIDS Prevention Street Nurse Program

Research Focus

The AIDS Prevention Street Nurse Program in Vancouver provides outreach services for preventing HIV and sexually transmitted infection in vulnerable, high-risk clients (Hilton et al., 2009; Hilton, Thompson, Moore-Dempsey, & Hutchinson, 2000, 2001). The program was awarded the Provincial Health Officer's Award of Excellence in 2007 and acknowledged as symbolizing best nursing practices and organizational commitment. Community health nurses with the program use harm reduction and health promotion approaches in their work. Harm reduction includes needle exchange for injection drug use, education to promote safer drug use and sexual behaviour, and support to clients in addiction treatment programs. Nurses go where the clients are: clinics, drop-in centres, detoxification centres, jails, door-to-door in hotels, or on the street.

Research Abstract

The purpose of the program evaluation study was to describe the nurses' work and its impact on clients, the challenges that nurses faced, and the program fit with other services (Hilton et al., 2001). Program nurses were interviewed, as were clients of the program, including youths living on the streets, sex trade workers, and injection drug users. Challenges facing nurses include building trust with clients, providing needed care or resources, and involving other health care providers. Clients reported gaining knowledge, feeling better about themselves, being supported, and changing their behaviours to help themselves and others (Hilton et al., 2000, 2001).

Evidence-Informed Practice

- Key strategies for reaching vulnerable populations include working with clients “at their location, on their own terms, and according to their own agenda” (Hilton et al., 2001, p. 274) and encouraging and facilitating client participation and choice.
- Client empowerment can be promoted through nurses' nonjudgemental care, trust, and respect.
- Educating marginalized clients about health promotion and harm prevention increases their self-concept and encourages them to change their behaviour.

References: Hilton, B. A., Thompson, R., & Moore-Dempsey, L. (2009). Evaluation of the AIDS prevention street nurse program: One step at a time. *Canadian Journal of Nursing Research*, 41(1), 238–258; Hilton, A. B., Thompson, R., Moore-Dempsey, L., & Hutchinson, K. (2001). Urban outpost nursing: The nature of the nurses' work in the AIDS prevention street nurse program. *Public Health Nursing*, 18(4), 273–280; and Thompson, R., Hilton, A. B., Moore-Dempsey, L., & Hutchinson, K. (2000). AIDS prevention on the streets: Vancouver nurses are taking AIDS prevention to the streets. *Canadian Nurse*, 96(8), 24–28.



BOX 4-6 NURSING STORY

Harm Reduction Nursing

Harm reduction initiatives, such as needle exchange programs now available in most Canadian provinces, exemplify community health nursing practice guided by primary health care, health promotion, empowerment, and ethical principles. The leadership, creativity, and dedication of nurses contributed significantly to the development of these initiatives. For example, Wood et al. (2003) successfully advocated for the establishment of a supervised injection site for injection drug users as part of the day program services provided by the Dr. Peter Centre in Vancouver's Downtown Eastside. Collaborating with local HIV and AIDS network members, researchers, and street nurses (see Box 4-4), they developed policies, procedures, and protocols to deliver harm reduction services to a highly vulnerable population in which stigmatizing risk behaviours were compounded by homelessness, precarious life circumstances, and chronic conditions and disabilities. In addition to the supervised injection site, nurses provide sterile drug injection supplies through a needle exchange program, teach about safe sex, offer condoms, talk with sex trade workers about safer ways of dealing with johns, counsel on addiction, support methadone maintenance regimens, and help when individuals are ready to enter detoxification programs or rehabilitation (Griffiths, 2002, p. 12). Serving the same population in Vancouver, Insite, North America's first dedicated legal supervised drug injection facility, opened in 2003 with diverse stakeholder engagement and provides health care, counselling, education, and support from a multidisciplinary team that includes nurses (Small et al., 2006; Wood et al., 2008). Since 1989, nurses with the Streetworks initiative in Edmonton have worked from several fixed daytime sites and from a mobile van for evening outreach to offer harm reduction strategies in partnership with agencies serving the inner-city community. Nurses' work in these initiatives illustrates many of the role dimensions needed for community health practice, including activities as communicator, facilitator, collaborator, coordinator, educator, care or service provider, community developer, policy formulator, and researcher. "Using professional practice to create change, the passion and leadership of a few nurses are resulting in an innovative approach. If such an approach were adopted across Canada, the number of human lives and health care dollars saved would be monumental" (Wood et al., 2003, p. 24). You are encouraged to reflect on these nursing roles and activities by reading more about these and similar programs in communities across the country.

Web Sites

Dr. Peter Centre: <http://www.drpeter.org/>

Insite: <http://www.vch.ca/sis/>

StreetWorks: <http://www.streetworks.ca/pro/index.html>

Standards, Competencies, Roles, and Activities in Community Health Nursing

Nurses in community health practice must have a broad base of knowledge and skills in order to work with clients to meet their health care needs and develop community relationships. Primary health care and health promotion approaches help nurses recognize the interplay between individual experience and social conditions, the value of diversity, and the importance of building capacity to promote health-enhancing change. The CHNC (2011) identified seven standards of practice for community health nurses: health promotion; prevention and health protection; health maintenance, restoration, and palliation; professional relationships; capacity building; access and equity;

and professional responsibility and accountability. These standards "define the scope and depth of community nursing practice; establish criteria and expectations for acceptable nursing practice and safe, ethical care; and inspire excellence in and commitment to community nursing practice" in nursing care, education, administration, and research (CHNC, 2011, p. 7). Nurses in community health nursing practice are responsible for meeting these professional nursing standards (CHNC, 2011). In addition, nurses in the specialty practice areas of public health or home health are responsible for meeting relevant competencies (i.e., having required knowledge, skills, and attitudes) (see CHNC, 2009, 2010; PHAC, 2007).

Community health nurses have multiple important roles in health promotion, disease and injury prevention, health protection, health surveillance, population health assessment, and emergency preparedness and response (CPHA, 2010). A summary of key activities engaged in by nurses in meeting responsibilities for these multiple roles was articulated in 1990 and updated in 2010 by the CPHA and is presented in the following sections.

Communication. *Communication* skills support all other activities in community health nursing practice. Skill as an effective communicator is closely related to the leadership and advocacy skills of the facilitator. You may use negotiation and mediation to foster collaboration.

Facilitation. To *facilitate* is to promote. Community health nurses work within a participatory process to identify issues, develop goals for change, and implement strategies for action and evaluation of results. Leadership and advocacy skills are key to these activities.

Leadership. *Leadership* focuses on supporting processes that build capacity among participants, rather than on directing or controlling decision making. To develop proactive approaches to health and environmental issues, you will need to apply knowledge of professional, community, and political issues and processes.

Advocacy. *Advocacy*, underpinned by commitment to equity and social justice, fosters attention and action to address social determinants of health and accessibility of care, especially among vulnerable populations. You may help clients become aware of issues that influence their health, build capacity to speak for themselves, and access resources to address issues.

Consultation. Community health nurses *consult* with clients and also community members, health care providers, professionals from other disciplines, members of other sectors, policymakers, and government officials. You respond to inquiries about and make referrals to community resources. By developing collaborative relationships, you support client access to these resources.

Team Building and Collaboration. *Team building and collaboration* is a way of working together characterized by recognition of interdependence, collective responsibility, and negotiated equity in relationships (Gray, 1989; Labonte, 1993). You may participate in a team or collective process as a collaborator with clients, community members, agencies, and sectors. This process is supported by developing honest relationships and mutual respect, recognizing many forms of expertise, valuing diversity, and being organized and committed.

Building Capacity. *Building individual and collective capacity* is a means to address health issues and overcome barriers to achieve enhanced quality of life outcomes (Labonte et al., 2002). You may help community members understand

their strengths and abilities, develop leadership, extend social networks, and work together. Group process skills are integral to supporting capacity-building activities.

Building Coalitions and Networks. Community health nurses also use capacity-building skills in situations where there is need for *building coalitions and networks* to support collective action on health issues. You may work with community members to identify the type of coalition or network that best fits their intended purpose, to clarify leadership roles, to create links between the coalition or network and the community at large, and to provide requested support to the coalition or network.

Outreach. *Outreach* supports a holistic approach to community nursing practice and is particularly critical when you work with vulnerable populations. Outreach often involves locating services in places that are considered safe or comfortable for potential users, using acceptable approaches to care, and working with clients “where they are at” including using harm reduction strategies.

Resource Management, Planning, Coordination. *Coordination*, often also involving *resource management and planning*, has long been associated with nursing practice. You work with clients and diverse agencies to plan and coordinate activities, resources, access, and care to promote client health. These activities complement activities focused on education, care/counselling, and community development.

Case Management. *Case management* skills are closely linked with resource management, planning, and coordination skills and activities. Your work will commonly involve case finding, including identification of potential clients in vulnerable circumstances, in addition to assessment as a basis for planning, implementing, and evaluating actions to address identified issues. Development of trusting relationships with clients, capacity building, and collaboration are central to effective case management.

Care/Counselling. Community health nurses provide *care/counselling* as they work with clients to promote and protect health and to prevent injury and illness. In many communities, home visiting remains integral to practice, as do services such as health assessment and immunization clinics. You treat illness, monitor risk conditions, educate or guide informed decision making, and support client self-care.

Referral and Follow-Up. Community health nurses work with individuals and families to make decisions about appropriate *referral and follow-up* care, services, or resources. You will need to develop and link with other providers, agencies, and networks to support effective and appropriate referral and follow-up.

Screening. *Screening* is intended to identify emerging, typically presymptomatic health problems for early treatment and improved health outcomes. Screening contributes to timely case finding. You work to ensure that clients understand and consent to screening activities, that acceptable approaches are used to support culturally safe and competent care, and that appropriate referral and follow-up are completed.

Surveillance. *Surveillance* information is used to enhance understanding of health threats or problems, their natural course, and intervention effectiveness. You may be involved in informal surveillance as well as formal or legally mandated protocols that contribute to documenting, interpreting, and sharing relevant surveillance information.

Health Threat Response. Community health nurses may be involved in *health threat response* procedures, such as

when a natural disaster occurs in a community. You must understand and follow established procedures that may include case investigation, provision of preventive care, and referral and follow-up for those needing treatment.

Health Education. Skillful and effective client education with individuals and groups requires a broad knowledge base, as well as communication and learning process skills. Nurses provide information to support community, family, and individual decision making. You may participate in formal education sessions, such as prenatal classes, or in informal sessions, such as discussions with families during home visits.

Community Development. Community health nurses apply knowledge of *community assessment and development* to support community participation. Participation encourages open identification of issues, shared decision making, egalitarian relationships, and collective ownership of action (Labonte, 1993). Participation and empowerment are closely linked.

Policy Development and Implementation. Activities related to *policy development and implementation* include identifying the need for policy and program development; participating in program development, implementation, and evaluation; helping establish policies to support practice; and using political processes to promote health. You need to support the collective voice of professional associations (e.g., CNA, CHNC) to advocate for health enhancing public policy. Falk-Rafael (2005) contends that “nurses, who practice at the intersection of public policy and personal lives, are, therefore, ideally situated and morally obligated to include political advocacy and efforts to influence health public policy in their practice” (p. 212).

Research and Evaluation. *Research and evaluation* are used to generate information, identify issues, determine directions for action, consider strategies to promote change, and assess results. You will need to review research and apply knowledge to practice. You may also engage in research and evaluation projects as a participant or investigator to support evidence-informed decisions about practice.

Community Assessment

As a community health nurse, you need to assess the community, the environment in which people live and work. Without an understanding of that environment, any effort to promote health and to support change is unlikely to succeed, whether you work with an individual, a family, a group, or a community as client.

The community can be seen as having three components: the locale or structure, the social systems, and the people. A complete assessment involves studying each component to understand the health status of the people and the health determinants that influence their health as a basis on which to identify needs for health policy, health program development, and service provision (for detailed descriptions of community assessment strategies, see community health nursing textbooks such as Stamler & Yiu, 2011; Stanhope et al., 2011; and Vollman et al., 2012). To assess the locale or structure, you might travel around the community and observe the physical environment, the location of services, and the places where residents congregate (completing a windshield or walking survey). Information about social systems, such as schools, health care facilities, recreation, transportation, and government, may be acquired by visiting various sites and learning about their services (observing activities, interviewing key

informants). Community statistics from a local library or health department can help assess a population's demographics and health status (reviewing population data). Discussion with community members, including a social and environmental health history (interviewing key informants, holding focus groups), is also helpful to identify priority issues within the community. It is essential to identify community resources and capacities, as well as issues and problems (Edwards & Moyer, 2000).

Recall the determinants of health as you consider the following scenario. As a community health nurse, you wish to familiarize yourself with the local area to help you begin to identify potential health concerns and available resources that will guide your work with the community. Your windshield and walking surveys reveal an older, high-density neighbourhood where pawn shops and bars outnumber grocery stores, schools, and community recreation facilities. You observe a culturally diverse population, including young families and older people who interact with each other at community events sponsored by faith-based groups and social agencies. Your observations are reinforced in discussions as you develop relationships with community leaders and health and social agency staff, whose perspectives are supported by census tract data and regional health statistics. You are alerted to tensions related to high unemployment and language barriers to services. Once you have a good understanding of the community, you may then perform individual or family client assessment against that background. For example, consider assessment of families in a low-income housing complex. Is lighting along walkways and entryways operational? Do they feel comfortable calling on their neighbours for assistance if necessary? Are health and social services easy to reach when needed? Do they feel a sense of belonging in the neighbourhood? No individual or family assessment should occur in isolation from the environment and conditions of the community setting. A collaborative approach to community assessment grounded in an empowerment process helps establish working relationships, identify shared concerns, recognize collective capacities, and develop effective strategies to enhance health.

Promoting Clients' Health

The challenge for nurses in community health practice is how to promote and protect the health of clients, whether within the context of their community or with the community as the focus. You may bring together the resources necessary to improve the continuity of client care. In collaboration with clients, health care and social service providers, and other community members, you coordinate health care services, locate appropriate social services, and develop innovative approaches to address clients' health issues.

Perhaps the key to being an effective community health nurse is the ability to understand clients' everyday lives. The foundation for this understanding is the establishment of strong, caring relationships with clients (see Chapters 17 and 18) that support empowerment as an active process rooted in cultural, religious, and personal belief systems and awareness of links between personal lives, community experiences, and social political contexts (Falk-Rafael, 2001, 2005). The quasi-insider status of nurses in a community often enables them to identify local patterns and needs that can be addressed through programs, policies, and advocacy (Baisch, 2009; SmithBattle et al., 2004) that are responsive, supportive, and effective. The

day-to-day activities of family and community life and the cultural, economic, and political environment influence how you adapt nursing interventions. Once you acquire an understanding of an individual's or family's life, interventions designed to promote health and prevent disease can be introduced. Similarly, understanding the relationships, activities, and concerns of groups and communities is central to health promotion practice. A continuing challenge for community health nurses is to take up their practice in ways that establish meaningful, respectful engagement with people in their communities and that promote individual, family, and collective empowerment, to enhance health in everyday life.

✦ KEY CONCEPTS

- A successful community health nursing practice involves building relationships with the community members and being responsive to changes within the community.
- The principles of public health nursing practice aim at assisting individuals in acquiring a healthy environment in which to live.
- The public health nurse cares for the community as a whole and considers the individual or family to be one member of a population or potential group at risk.
- The home health nurse's competence is based on decision making at the level of the individual client.
- Within an ecological model of home health nursing, the individual is viewed within the larger systems of family, social network, community, and society.
- Vulnerable individuals and their families often belong to more than one vulnerable group.
- The distinctive needs of vulnerable populations contribute to the challenges that nurses face in caring for these clients.
- Exacerbations of chronic health problems are common among homeless people because they have few resources.
- An important principle in dealing with clients at risk for or who may have suffered abuse is protection of the client.
- Clients who engage in risk behaviours such as substance abuse may respond to a harm reduction approach.
- In community health practice, it is important to understand what health means to clients and what they do to maintain their own health.
- A community health nurse must be competent in fulfilling a multidimensional role, including engaging in communication; facilitation; leadership; advocacy; consultation; team building and collaboration; building capacity; building coalitions and networks; outreach; resource management, planning, and coordination; case management; care/counselling; referral and follow-up; screening; surveillance; health threat response; health education; community development; policy development and implementation; and research and evaluation activities.
- Assessment of a community includes assessing population health status and relevant determinants of health in relation to three elements: locale or structure, the social systems, and the people.
- An important consideration in becoming an effective community health nurse is to strive to understand clients' lives.

✦ CRITICAL THINKING EXERCISES

1. You are working with the family of a severely disabled child and learn that no respite services to provide parental support, and only limited educational resources, are available in your community. What activities or roles of the community health

- nurse would be important to establish a special education day care service, operated by volunteer educators?
- Mr. Crowder is a 42-year-old man with diabetes mellitus and visual impairment. Your assessment reveals that he is homeless and spends nights in a local shelter. He is not able to buy medications or ensure adequate diet to control his blood glucose. What factors might you consider to support Mr. Crowder's self-care?
 - Conduct a community assessment of an area that you have visited infrequently. Observe the community locale by driving or walking through the more populated area. Look for the following services: hospital, clinic, pharmacy, grocery store, schools, park or playground, and police and fire departments.

❖ REVIEW QUESTIONS

- The overall goals of a population health approach are to
 - Maintain and improve the population's health and eliminate health disparities
 - Gather information on incidence rates of certain diseases and social problems
 - Assess the health care needs of individuals, families, or communities
 - Develop and implement public health policies and improve access to acute care
- Public health nursing merges knowledge from professional nursing theories and the
 - Population sciences
 - Public health sciences
 - Environmental sciences
 - Social sciences
- Home health nursing involves acute, chronic, and palliative care of clients and families to enhance their capacity for
 - Nursing care that promotes autonomy in decision making
 - Improving their health care and self-care
 - Self-care and autonomy in decision making
 - Learning about their illnesses
- Vulnerable populations are more likely to develop health problems as a result of
 - Acute diseases, homelessness, and poverty
 - Lack of transportation, dependence on others for care, and lack of initiative
 - Poverty, lack of education, and mental illness
 - Excess risks, barriers to health care services, and dependence on others for care
- Which is *not* an aspect of competent care of vulnerable populations?
 - Providing culturally appropriate care
 - Creating a comfortable, nonthreatening environment
 - Assessing living conditions
 - Offering financial or legal advice
- Major public health problems affecting older adults, women, and children are
 - Prescribed medication abuse, poverty, sexual abuse
 - Physical, emotional, and sexual abuse, as well as neglect
 - Acute illnesses, neglect, substance abuse
 - Financial strain, poverty, physical abuse

- A successful community health nursing practice requires
 - A graduate degree in health education or health promotion
 - Building relationships with and responding to changes in the community
 - Taking a passive role to allow the community to initiate change
 - Subspecialty education in public health sciences
- Teaching classes about infant care, cancer screening, and home safety adaptations for older people are examples of a nurse engaging in which activity?
 - Consultation
 - Collaboration
 - Health education
 - Facilitation
- A community health nurse who is directing a client to community resources is an example of which activity?
 - Consultation
 - Collaboration
 - Coordination
 - Research
- A community includes the following three elements, each of which must be assessed:
 - Locale or structure, social systems, and people
 - People, neighbourhoods, and social systems
 - Health care systems, geographic boundaries, and people
 - Environment, families, and social systems

❖ RECOMMENDED WEB SITES

Canadian Public Health Association: <http://www.cpha.ca>

The Canadian Public Health Association (CPHA) is a national, independent, not-for-profit, voluntary association representing public health care in Canada.

Community Health Nurses of Canada: <http://www.chnc.ca/>

The CHNC is a national organization. It provides standards and information on community health nursing.

Fact Sheet: The Primary Health Care Approach: http://www2.cna-aiic.ca/CNA/documents/pdf/publications/FS02_Primary_Health_Care_Approach_June_2000_e.pdf

This Canadian Nurses Association publication defines and describes primary health care in Canada.

Public Health Agency of Canada: Health Promotion: <http://www.phac-aspc.gc.ca/hp-ps/index-eng.php>

This federal Web site provides links to many useful health promotion resources and guides that will aid health professionals and community leaders.

Victorian Order of Nurses: <http://www.von.ca/>

The Victorian Order of Nurses (VON) is Canada's leading charitable organization addressing community health and social needs.

Review Question Answers

1. 1; 2. 2; 3. 3; 4. 4; 5. 4; 6. 2; 7. 2; 8. 3; 9. 1; 10. 1

Rationales for the Review Questions appear at the end of the book.

Theoretical Foundations of Nursing Practice

Written by Sally Thorne, RN, PhD

objectives

Mastery of content in this chapter will enable you to:

- Define the key terms listed.
- Describe selected theories of nursing practice and differentiate between them.
- Describe challenges inherent in theorizing about nursing practice.
- Recognize selected conceptual frameworks associated with nursing practice.
- Appreciate the historical development of thought related to nursing practice.
- Interpret current debates surrounding various theories of nursing practice.
- Describe relationships between theorizing and other forms of nursing knowledge.
- Appreciate the role of “theorizing” about the essence of nursing.

key terms

- | | |
|------------------------------|------------------------------|
| Assumption, p. 54 | Nursing process, p. 55 |
| Concept, p. 54 | Nursing science, p. 55 |
| Conceptual framework, p. 55 | Nursing theory, p. 54 |
| Conceptualization, p. 54 | Paradigms, p. 58 |
| Descriptive theory, p. 56 | Philosophy of science, p. 55 |
| Grand theory, p. 56 | Praxis, p. 63 |
| Metaparadigm concepts, p. 56 | Prescriptive theory, p. 56 |
| Middle-range theory, p. 56 | Proposition, p. 54 |
| Models for nursing, p. 55 | Theoretical model, p. 56 |
| Nursing diagnosis, p. 55 | Theory, p. 54 |
| | Ways of knowing, p. 58 |

media resources

evolve WEBSITE

<http://evolve.elsevier.com/Canada/Potter/fundamentals/>

- Audio Chapter Summaries
- Examination Review Questions
- Glossary
- Student Learning Activities
- Weblinks

Although many nursing tasks can be mastered by anyone trained to perform them, the hallmark of nursing practice is a unique body of knowledge combined with a set of principles that guide the systematic application of that knowledge in an expanding array of contexts. **Nursing theory** aims to organize knowledge about nursing to enable nurses to use it in a professional and accountable manner (Beckstrand, 1978).

A **theory** is a purposeful set of **assumptions** or **propositions** that identify the relationships between **concepts**. Theories are useful because they provide a systematic view for explaining, predicting, and prescribing phenomena. Although nursing theories are not generally propositional, they reflect a **conceptualization** of nursing for the purpose of describing, explaining, predicting, or prescribing care (Meleis, 2007). Theories constitute one aspect of disciplinary knowledge and create vital linkages to how inquiry is approached (Fawcett et al., 2001). Nursing theories provide nurses with a perspective from which to view client situations, a way to organize data, and a method of analyzing and interpreting information to bring about coherent and informed nursing practice.

Early Nursing Practice and the Emergence of Theory

Although nursing practices have been documented throughout history (Yura & Walsh, 1973), the advent of modern nursing practice, in which the knowledge and practice of nursing are formalized into a professional context, is often attributed to the work of Florence Nightingale, a visionary leader in Victorian England who created systems for nursing education and practice (see Chapter 3). Contemporary scholars now consider Nightingale's work as an early theoretical and conceptual **model for nursing**. Her descriptive theory provided nurses with a way to think about nursing practice in a frame of reference that focuses on patients and the environment.

Since Nightingale's era, the status of nursing practice has paralleled that of the authority of women in society. After World War II, major developments in science and technology had a powerful influence on health care, including nursing practice. **Nursing science** came into its own. No longer simply applying the knowledge of other disciplines, nurses now began to acquire a unique body of knowledge about the practice of nursing.

Since the 1960s, scientific knowledge has proliferated across all disciplines. In particular, knowledge about nursing has drawn from and contributed to developments in health sciences, basic physical sciences, social and bio-behavioural sciences, social theory, ethical theory, and the **philosophy of science**. Each of these sources has relevance for the interpretation of nursing care and the synthesis of relevant facts and theories for application to practice.

A number of major developments in nursing theory occurred in the late 1960s (Meleis, 2007). The health care system was expanding and changing, influenced by scientific discoveries and technological applications. Disease intervention became more sophisticated and scientifically driven. The focus of society shifted from simply attending to sick and injured people toward the larger problem of curing and eradicating disease, which expanded the influence of physicians over the structure of health care delivery. For the first time, nurses realized the urgency of articulating exactly how their role differed from those of the other health care professionals (Chinn & Kramer, 2011; Engebretson, 1997; Fawcett, 2004; Newman, 1972).

The drive for early theorizing about the practice of nursing was led by nurse educators, who noted that traditional ways of preparing professional nurses were rapidly becoming outdated. Until the 1960s, a nursing apprenticeship model, augmented by lectures offered by physicians, had seemed sufficient. Around this time, nursing educational leaders became inspired to theorize about nursing in order to structure and define what a curriculum oriented to nursing knowledge might contain (Dean, 1995; Orem & Parker, 1964; Torres, 1974). This meant grappling with large theoretical and philosophical questions, such as the following:

- What are the focus and scope of nursing?
- How is nursing unique and different from other health care professions?
- What should be the appropriate disciplinary knowledge for professional nursing practice?

To answer these questions, early theorists developed **conceptual frameworks**, in which they organized core nursing concepts and proposed relationships among these concepts. These conceptual frameworks were "mental maps" whose

purpose was to make sense of the information and decisional processes that nurses needed to apply knowledge to nursing practice (Ellis, 1968; Johnson, 1974; McKay, 1969; Wald & Leonard, 1964). Expressing knowledge about nursing in scientific language created a context in which nursing science gained stature and flourished (Cull-Wilby & Peppin, 1987; Jones, 1997). However, these nursing theories were not the kind of scientific theories that could be confirmed or disproved with empirical evidence (Levine, 1995); rather, they represented ideas about how nurses might organize knowledge, as well as the processes by which they would apply that knowledge to unique practice situations. Table 5-1 defines some of the basic terms that are used in theorizing about scientific issues.

Nursing Process

Early nursing theorists sought to organize the knowledge about the practice of nursing that nurses draw upon to direct their approach to clinical encounters. However, theorists generally lacked ways of systematically explaining how nurses work with knowledge in new situations (Field, 1987). An important early step in the application of knowledge to nursing practice was Orlando's (1961) development of a problem-solving approach that came to be known as the **nursing process** (Yura & Walsh, 1973). This process originally involved four steps: assessment, planning, intervention, and evaluation, whereby each step represented a distinct way in which general nursing knowledge could be applied to unique and individual nurse-patient situations (Carnevali & Thomas, 1993; Henderson, 1966; Meleis, 2007; Torres, 1986):

- **Assessment phase:** Nurses would gather information, including biological, sociocultural, environmental, spiritual, and psychological data, to create an understanding of the patient's unique health or illness experience. Organizing the data would enable the nurses to interpret major issues and concerns (Barnum, 1998) and produce a **nursing diagnosis**: the nurse's perspective on the appropriate focus for the patient (Durand & Prince, 1966).
- **Planning phase:** Nurses would prioritize the issues raised during assessment in relation to the nursing diagnoses, identify which issues could be supported or assisted by nursing intervention, and create a plan of care.
- **Intervention phase:** The plan of care would be carried out.
- **Evaluation phases:** The plan's success or failure would be judged both against the plan itself and against the patient's overall health status; that is, it would be determined whether the intended outcomes had been achieved or whether the nursing intervention strategies required revision. The nursing process was intended as a sequence within which thoughtful interpretation always preceded action, and the effects of action were always evaluated in relation to the original situation.

The nursing process was widely accepted by nurses because it was a logical way to describe basic problem-solving processes in which knowledge was used effectively to guide nursing decisions (Henderson, 1982). Nurses quickly adopted the nursing process because it represented a continuous, rapid cycling of information through each of the phases. Although it was useful for organizing and applying knowledge to clinical practice (Meleis, 2007), some later theorists began to challenge the nursing process as being too linear and rigid for nursing's purposes (Varcoe, 1996).

► **TABLE 5-1** The Terminology of Scientific Theorizing

Term	Description	Example
Concept	A mental formulation of objects or events, representing the basic way in which ideas are organized and communicated.	Anxiety
Conceptualization	The process of formulating concepts.	Framing behavioural patterns as anxiety related
Operational definition	A description of concepts, articulated in such a way that they can be applied to decision making in practice. It links concepts with other concepts and with theories, and it often includes the essential properties and distinguishing features of a concept.	Differentiation and measurement of state and trait anxiety
Theory	A purposeful set of assumptions or propositions about concepts; shows relationships between concepts and thereby provides a systematic view of phenomena so that they may be explained predicted, or prescribed.	Social determinants of illness
Assumption	A description of concepts or connection of two concepts that are accepted as factual or true; includes “taken for granted” ideas about the nature and purpose of concepts, as well as the structure of theory.	“Nursing exists to serve a social mandate”
Proposition	A declarative assertion.	“Clients who receive appropriate nursing care have better health outcomes”
Phenomenon	An aspect of reality that can be consciously sensed or experienced (Meleis, 2007); nursing concepts and theories represent the theoretical approach to making sense of aspects of reality of concern to nursing.	Pain
Theoretical model	Mental representation of how things work. For example, an architect’s plan for a house is not the house itself but rather the set of information necessary to understand how all of the building elements will be brought together to create that particular house.	Biopsychosocial model of health
Conceptual framework	The theoretical structure that links concepts together for a specific purpose. When its purpose is to show how something works, it can also be described as a theoretical model. Nursing conceptual frameworks link major nursing concepts and phenomena to direct nursing decisions (e.g., what to assess, how to make sense of data, what to plan, how to enact a plan, and how to evaluate whether the plan has had the intended outcome). Conceptual frameworks are also often referred to as nursing models or nursing theories (Meleis, 2007).	Orem’s (1971) self-care model for nursing

In current practice, terms such as *clinical judgement* are used to refer to reasoning processes that rely on *critical thinking* and multiple ways of knowing; clinical judgement implies the systematic use of the nursing process to invoke the complex intuitive and conscious thinking strategies that are part of all clinical decision making in nursing (Alfaro-LeFevre, 2008; Benner & Tanner, 1987; Tanner, 1993).

Conceptual Frameworks

The conceptual framework builders of the late 1960s and after are usually referred to as the nursing theorists. All were fascinated with how effective nurses systematically organize general knowledge about nursing in order to understand an individual patient’s situation and determine which of many available strategies would work best to restore health and ameliorate or prevent disease (Orem & Parker, 1964). This reasoning process was different from linear, cause-and-effect reasoning, and it was what the nursing theorists understood to be the hallmark of excellence in nursing practice (Barnum, 1998; Meleis, 2007). Indeed, when effective nurses made intelligent clinical decisions, it was often difficult to determine the

precise dynamics that explained how those nurses applied that knowledge (Benner et al., 1996).

The building of nursing models was an attempt to theorize how all nurses might be taught to organize and synthesize knowledge about nursing so that they would develop advanced clinical reasoning skills (Raudonis & Acton, 1997). Theorists who developed these frameworks and models sought to depict theoretical structures that would enable a nurse to grasp all aspects of a clinical situation within the larger context of available options for nursing care. Table 5-2 describes four types of theory: **grand theory**, **middle-range theory**, **descriptive theory**, and **prescriptive theory**.

Metaparadigm Concepts

Each conceptual framework was an attempt to define nursing by creating a theoretical definition for the substance and structure for determining the key bodies of knowledge that would be needed to understand particular clinical situations (Figure 5-1). This collective body of knowledge was called the **metaparadigm concepts** and included the concepts of person, environment, health care, and nursing care (Fawcett, 1992).

► TABLE 5-2 Types of Theory

Type of Theory	Description
Grand theory	Global, conceptual framework that provides insight into abstract phenomena, such as human behaviour or nursing science. Grand theories are broad in scope and therefore require further application through research before the ideas they contain can be fully tested (Chinn & Kramer, 2011). They are intended not to provide guidance for specific nursing interventions but rather to provide the structural framework for broad, abstract ideas about nursing. They are sometimes called paradigms because they represent distinct world views about those phenomena and provide the structural framework within which narrower-range theories can be developed and tested.
Middle-range theory	Encompasses a more limited scope and is less abstract. Middle-range theories address specific phenomena or concepts and reflect practice (administration, clinical, or teaching). The phenomena or concepts tend to cross different nursing fields and reflect a variety of nursing care situations.
Descriptive theory	Describes phenomena (e.g., responding to illness through patterns of coping), speculates on why phenomena occur, and describes the consequences of phenomena. Descriptive theories have the ability to explain, relate, and in some situations predict phenomena of concern to nursing (Meleis, 2007). Descriptive nursing theories are designed not to direct specific nursing activities but rather to help explain client assessments and possibly guide future nursing research.
Prescriptive theory	Addresses nursing interventions and helps predict the consequences of a specific intervention. A prescriptive nursing theory should designate the prescription (i.e., nursing interventions), the conditions under which the prescription should occur, and the consequences (Meleis, 2007). Prescriptive theories are action oriented, which tests the validity and predictability of a nursing intervention. These theories guide nursing research to develop and test specific nursing interventions (Fawcett, 2004).

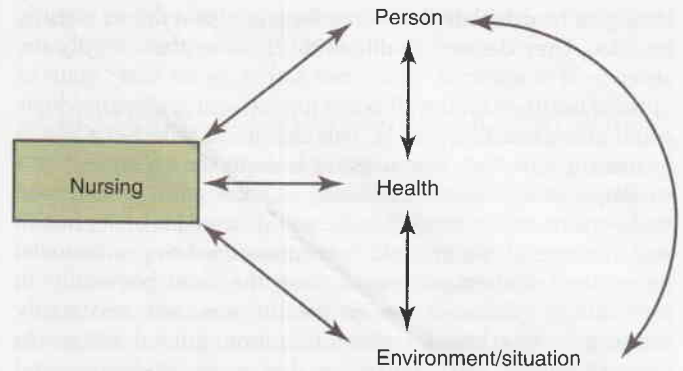


Figure 5-1 Nursing's metaparadigm concepts.

Client and Person

By the 1960s, professional leaders recognized that nurses did much more than simply care for hospitalized patients. Because of this, nursing theorists started to use the term *client*, rather than *patient*, to refer to the person at the centre of any nursing process. The term signified a range of health states, including both sickness and wellness, and an explicitly interactive relationship between the nurse and the persons to whom care was directed. At the same time, nurses were becoming aware of their potential to deliver care beyond the individual—that is, to families, groups, and communities. Although theories to articulate the role of nursing care in families and communities also began to arise around this time, most early conceptual models focused on the individual.

To help nurses systematically organize and make sense of the vast amount of information that might be relevant to the care of any particular client, most early models clearly defined the concept of the person. Theorists variously understood a person as a system of interacting parts, a system of competing human needs, or an entity with biological, psychological, social, and spiritual dimensions. Each framework drew attention to multiple aspects of human experience so that the nurse could understand each instance of wellness and illness for its uniqueness within the context of that individual's body, feelings, and situation. Each model depicted a way of thinking about a whole individual, with the aim of helping nurses understand how the implications of any action or intervention could be systematically individualized toward the benefit of all facets of that individual.

Environment

Each conceptual framework reflected an understanding that the person is part of and interacts with a complex environmental system. This environment may involve the person's family and social ties, the community, the health care system, as well as the geopolitical issues that affect health. The early conceptual frameworks helped shape nurses' increasing appreciation of how to work within a larger context of every experience of wellness and illness. In so doing, these frameworks led to a future in which nurses would spearhead advances in social and health care policy, health promotion, and community development.

Health

Because nursing exists within a social mandate to improve the health of both the individual and society, the early theorists

struggled to articulate the overarching goal that drives nursing practice. They defined health as much more than simply the absence of disease or injury but rather as an ideal state of optimal health or total well-being toward which all individuals could strive (see Chapter 1). This definition reflected a vision of nursing care that was relevant to both the individual and society, and applied to all clients, sick or well. It recognized that persons with chronic disease could strive for better health and that overall health could be compromised by psychosocial or spiritual challenges, even among the most physically fit individuals. Although perfect health was not necessarily achievable, this broad conceptualization guided nurses to help all clients reach outcomes that were productive and satisfying.

Nursing

Each early conceptual framework included a unique definition of nursing that linked a view of the client with an understanding of the person's environment, life, and health goals. Built on a distinct subset of knowledge, each conceptual framework presented a coherent and complete belief system about nursing practice, although each did so in different terms and with a different alignment of ideas. Because most nursing scholars of the era assumed that one model would eventually become dominant (Meleis, 2007), competition among the frameworks occurred. Over time, as enthusiasm for the idea of implementing theory-based practice grew, the application of the frameworks in practice became rigid and codified. Although the original focus had been on guiding nurses to think systematically, the implementation process caused the emphasis to shift toward such aspects as using language in particular ways and filling out assessment forms correctly. Many experienced nurses began to conclude that these frameworks actually inhibited their systematic thinking, and much debate ensued with regard to the utility of the models.

Philosophy of Nursing Science

When nursing theorists began developing their frameworks and models, nurses understood the process of building a knowledge base as a matter of science and discovery. In that context, theories were considered logical propositions that could be rigorously tested for their capacity to answer (or not answer) the hypothetical questions posed by a discipline. However, while creating frameworks for the complex reasoning in nursing practice, these early theorists were applying traditional scientific ways of understanding how knowledge works without fully appreciating the limitations of science, especially in relation to complex problems. As thinkers in all disciplines began to move beyond their traditional boundaries, other possibilities for the development of knowledge about the practice of nursing began to emerge.

Scientific Revolutions

Thomas S. Kuhn, a philosopher of science, created a way of thinking about science and knowledge that expanded thought in many disciplines. First published in 1962, his book *The Structure of Scientific Revolutions* was popularized in the 1970s and 1980s as scholars began to realize the potential of its ideas to support new thinking about how knowledge is built. Kuhn challenged the traditional notion of science as a logical progression of discoveries, arguing that major scientific developments occurred only when scientists thought about problems

in radically new ways. These ways of thinking departed from the traditional to such an extent that an entirely different world view, or "paradigm shift," developed. According to Kuhn, scientific advances happen when people think creatively and look beyond established norms. Such creative thinking could stimulate new understandings of problems that were once considered irresolvable (e.g., quantum physics introduced the idea that the behaviour of very small particles could explain atomic behaviour in ways that defied explanation through conventional Newtonian physics). This new way of thinking about the philosophy of science led nurses to consider their theoretical frameworks as not only theoretical propositions about logical relationships among concepts, but as actual world views, or **paradigms**, that might help them grasp the complexities of nursing (Fry, 1995).

Complexity Science

A second major shift in scientific thinking occurred with the introduction of chaos theory (Gleick, 1987). Originating from observations in physics that predictable patterns existed among factors that could not be predicted scientifically, this theory created a new way of approaching complex situations. In rejecting the simple cause-and-effect relationships used in traditional science, chaos theory led to what has been termed *complexity science*. In this kind of science, dynamic and interactive phenomena are reduced to the smallest properties that can be observed within their natural context so that their interactions can be interpreted with as little interference as possible from prior assumptions. For example, chaos theory explains how, in sensitive weather systems, minor variations in initial conditions (e.g., barometric pressure) might explain large-scale physical patterns over time (e.g., hurricanes). These ideas created a new language to apply to scientific thinking. Because experiences of health and illness are exceedingly difficult to understand out of their individual context, chaos theory offered a new way to approach nursing science (Coppa, 1993; Ray, 1998).

Ways of Knowing in Nursing Practice

As ideas shifted, nursing theorists also realized that science was just one of several forms of knowledge necessary for their practice discipline. In 1978, Carper published an influential paper in which she used the expression **ways of knowing** to refer to patterns of knowledge application in nursing practice. Carper articulated a critical role in nursing practice not only for empirical science but also for ethical, personal, and aesthetic knowledge (see Chapter 6). Later theorists added sociopolitical knowledge (White, 1995) and critical thinking (see Chapter 11) to the list of central ways of knowing that are essential to the highest quality of clinical nursing. These ideas contributed to discussions emerging in other social and life sciences around *how* nurses know what they know (Chinn & Kramer, 2011; Kikuchi & Simmons, 1999).

Paradigm Debates Within Nursing

With the new philosophical approach to scientific knowledge, nurses struggled with how to define their work as both an art and a science and as both applied and practical (Donaldson, 1995; Johnson, 1991; Rodgers, 1991; Sarter, 1990). Ideas about the theoretical foundations of nursing practice shifted. Some scholars began to question conceptual models as a valid form

of theorizing (Holden, 1990). The frustration resulting from overly formal and rigid approaches to applying many of these models led to a period of what has been called *model bashing* (Engebretson, 1997). However, the question confronting the early theorists remained as follows: How does a nurse organize and make sense of all available knowledge and apply it intelligently to the challenges that arise in an individual clinical case?

In this context, many nurse scholars began to recognize that the original theories were better understood as philosophical statements than scientific prescriptions. However, one group of theorists, considering some of the original theories to be overly simplistic and insufficiently holistic, began to categorize various nursing models as reflective of two entirely different paradigms of thinking (Parse, 1987). Considering the majority of nursing models and frameworks to be old-fashioned and outdated, this group of theorists coined the term *totality paradigm frameworks* to describe them, contending that this kind of model reduced an understanding of the human person to fragmented parts out of context. They further proposed the term *simultaneity paradigm frameworks* to depict a set of conceptual frameworks they considered to be radically different and preferable by virtue of being both holistic and philosophically sophisticated (Parse, 1987). Some advocates of simultaneity theories continue to depict the diverse universe of theorizing about nursing as reflecting these two mutually exclusive groupings, positioning one set of conceptual frameworks as philosophically and morally superior to what they understand the other to represent (Cody, 1995; Nagle & Mitchell, 1991; Newman, 1992).

Nursing Diagnosis

Another discussion about nursing theory centred on nursing diagnosis. The scholars who devised conceptual frameworks focused on models to assess and interpret data about individual patient situations. However, the conceptual frameworks were less explicit about how to plan, implement, and evaluate nursing care. To fill this gap, nursing diagnosis emerged as an additional phase in that process. In making explicit the idea that nurses arrived at a clinical judgement relating to actual or potential health processes, it became a discrete focus of theorizing about nursing care.

In the 1970s, some scholars noted a need for precise language to categorize and document nursing diagnoses into a taxonomy (Warren & Hoskins, 1990). This resulted in the formation of the North American Nursing Diagnoses Association (NANDA) (see Chapter 13), which held a series of consensus conferences to establish a list of the common patient problems addressed by practising nurses. The nursing diagnosis movement led to considerable general debate on the merits of using NANDA's fixed list of nursing diagnoses as compared to the theoretically infinite options for nursing care that had been intended by the conceptual models (Fitzpatrick, 1990; Roy, 1982). Although it is recognized as practical rather than theoretical (Fitzpatrick, 1990), NANDA's list has become a popular device for organizing nursing care in part because it enables efficient categorization into electronic databases and the subsequent standardization of nursing care plans (Warren & Hoskins, 1990). However, despite its popularity with health care administrators, NANDA's list is recognized by many nurses as a system that relies entirely upon an agreement about what constitutes average wellness and illness experiences. It

can therefore create worrisome barriers to the individualized care of patients (Lee et al., 2006).

Reflections on Conceptualizing Nursing

The scientific and philosophical aspects of today's nursing practice are built on the foundation of early theorizing about nursing. The history of "nursing theory" is the story of an enlightened attempt to articulate excellent clinical reasoning in nursing care. How effective nurses actually use knowledge within the complexity of their clinical reasoning is, however, still difficult to determine. In this context, theorizing about nursing is perhaps best understood as an extended philosophical struggle to make sense of how highly skilled nurses actually think. Instead of arguing the advantages of one nursing theory over another, nursing scholars of today appreciate the creativity of their predecessors within the constrained conceptual contexts in which they were expected to operate.

Major Theoretical Models

Some of the major theoretical models are summarized briefly in Box 5-1; the similarities and differences among them are illustrated. Note, however, that because many nursing theorists based their models on complex combinations of theories from many disciplines, the categorization used here is somewhat oversimplistic. It may be helpful to view the conceptual frameworks in terms of larger theories upon which they have drawn, such as adaptation theory, systems theory, or human needs theory.

► BOX 5-1

Milestones in the Development of Nursing Theory

1859	Florence Nightingale's <i>Notes on Nursing: What It Is and What It Is Not</i> was published (updated version published 1946)
1952	<i>Nursing Research</i> (the first peer-reviewed scientific journal about nursing care) was established
1952	Hildegard Peplau's text on <i>Interpersonal Relations in Nursing</i> was published
1955	Virginia Henderson's definition of nursing was first published in the 5th edition of Harmer and Henderson's (1955) basic nursing text
1961	Ida Orlando introduced the nursing process
1970	Martha Rogers's model was first published
1970	Callista Roy's model was first published
1971	Dorothea Orem's model was first published
1976	The North American Nursing Diagnosis Association (NANDA) list of nursing diagnoses was first published
1976	The University of British Columbia model of nursing practice was first published (Campbell et al., 1976)
1978	Barbara Carper's paper on fundamental patterns of knowing in nursing practice was published
1979	Evelyn Adam's model was first published (English version published 1980)
1981	Rosemarie Parse's model was first published
1987	The McGill model of nursing was first published (Gottlieb & Rowat, 1987)

Practice-Based Theories

All conceptual models of nursing are designed to guide and shape practice. Although their theoretical inspiration is derived directly from the practice setting, many conceptual models do not capture all of what might be influencing that practice, such as societal and demographic changes, current health care belief models, and therapeutic strategies, as well as the political struggles inherent in health care delivery. The early practice theories, therefore, reflect the issues that were shaping the role and context of nursing during those specific time frames.

Florence Nightingale. Whereas most later theorists drew on social and psychological theories, Nightingale was directly inspired by nursing practice. Writing *Notes on Nursing* in 1859, she described conditions necessary to promote health and healing. Her observations during the Crimean War led to the first set of principles for nursing practice, acknowledging the particular importance of the environment, including clean living areas, fresh air, and the presence of light. The role of nursing care included ensuring that wounded soldiers were warm, comfortable, and adequately fed. Torres (1986) noted that Nightingale demonstrated how to think about patients and their environment. By shifting the focus from disease processes toward an environment conducive to healing, Nightingale's conceptualization clearly differentiated the role of nursing from that of medicine.

The McGill Model. Dr. Moyra Allen (Box 5-2) conceived the McGill model, and she and her colleagues developed it (Gottlieb & Rowat, 1987). Systematically studying actual nursing situations, Allen and her colleagues created a way of thinking about nursing that focused on promoting health. They recognized that many patients' health concerns were best approached through changes in lifestyle. The McGill scholars focused on the individual in the context of the family and, like Nightingale, viewed nursing as complementary to medicine. The main features of the McGill model were "a focus on health rather than illness and treatment, on all family members rather than the patient alone, on family goals rather than on the nurse's, and on family strengths rather than their deficits" (Gottlieb & Feeley, 1999, p. 194). Over time, the model has been further developed to demonstrate its application within a range of clinical contexts and settings (e.g., Feeley & Gerez-Lirette, 1992; Feeley & Gottlieb, 1998).

Needs Theories

Many early theorists organized their thinking by conceptualizing the patient as representing a collection of needs. This reflected a common orientation to studying the nature of people, popularized in the 1960s, in which needs, drives, and competencies were thought to hold potential for explaining human behaviour. Of these theories, Maslow's (1954) hierarchy of needs was one of the best known and most influential. The idea that complex human behaviour can be best explained as a response to the competing demands of various basic needs is featured prominently in many nursing models.

Virginia Henderson. Henderson (Harmer & Henderson, 1955) conceptualized the patient as a compilation of 14 basic human needs: to breathe, eat and drink, eliminate waste products, move and maintain posture, rest and sleep, dress and undress, maintain body temperature, be clean, avoid danger, communicate, worship, work, play, and learn. Viewing the patient in this way clearly defined the nurse's role. Accordingly, Henderson defined nursing practice as assisting the individual, sick or well, in the performance of activities that

> BOX 5-2

Milestones in Canadian Nursing History



Moyra Allen, 1921-1996

A creative and independent thinker, Moyra Allen was one of the first Canadian nurses to earn a doctoral degree. She lobbied for collective bargaining rights for nurses and was the founding president of the United Nurses of Montreal. She was also the founder of *Nursing Papers*, later renamed the *Canadian Journal of Nursing Research*.

Allen was a founding member of the World Health Organization committee that developed the criteria for accreditation of nursing schools. She designed an evaluation model for nursing schools and evaluated schools in South America, India, and Ghana. She joined the faculty of the School of Nursing at McGill in 1954 and became professor emeritus in 1985 on her retirement.

In demonstrating her model of nursing, now known as the McGill model, Dr. Allen established The Health Workshop in 1977, a community health facility, in which she put into practice a developmental concept of health and nursing as a prototype of primary health care. The workshop, viewed as complementary to existing services, was staffed with nurses, a community development officer, and a health librarian. The workshop's purpose was to demonstrate the validity of a local health resource managed by nurses that focused on long-term family health. It proved to be an innovative means of improving the health status of families coping with illness and other problems.

Allen received numerous awards, including the Jeanne Mance Award, which recognizes major contributions to the health of Canadians. In 1986, she was named an Officer of the Order of Canada for her outstanding contributions to Canadian nursing.

contribute to health, recovery, or a peaceful death. Henderson's model has remained popular in practice because its language is familiar and easily comprehensible and because it explains how a person's biological, psychological, social, and spiritual components combine to influence the way illness is experienced and health can be regained.

Dorothea Orem. Orem's (1971) self-care theory, the origins of which lay in Henderson's work, was used widely in both nursing practice and research. Orem's theory addressed the ways in which people are responsible for meeting the following universal self-care requisites:

- Maintaining sufficient intake of air, water, and food
- Maintaining a balance between activity and rest, and between solitude and interaction
- Providing for elimination processes
- Preventing hazards to life, functioning, and well-being
- Promoting functioning and growth in social groups in accordance with human potential

Drawing on both human need and developmental theory, Orem's theory focused on the individual's role in maintaining health. This theory emerged at a time when the passive role of the patient was being questioned and the health care system was beginning to shift away from full responsibility for people's health. With increased understanding of illness patterns, Orem acknowledged the effects of multiple lifestyle factors

such as smoking, diet, and exercise, reminding nurses that patients can look after their own health and that they must learn to care for themselves within their families and communities. Thus, the role of the nurse, according to Orem, was to act temporarily for the patient until the patient could resume a more independent role in self-care.

Interactionist Theories

Interactionist theories focused on the relationships between nurses and their clients. These theories defined more clearly the specific human communicative and behavioural patterns by which practitioners met their patients' needs. As the theorists reframed definitions of the nursing profession, they drew from the work of psychologists and psychoanalysts such as Harry Stack Sullivan, Abraham Maslow, and Sigmund Freud.

Hildegard Peplau. Peplau, a psychiatric specialist, defined the core of nursing care as the interpersonal relationship between the nurse and the patient. Building upon the ideas of psychoanalyst Harry Stack Sullivan, Peplau depicted the practice of nursing as an interactive and therapeutic relationship. Peplau felt that such relationships allowed nurses to challenge the practice of long-term stays in large inpatient psychiatric hospitals and to envision supporting patients to achieve independent living. "The kind of person each nurse becomes makes a substantial difference in what each patient will learn as he is nursed through his experience with illness" (Peplau, 1952, p. vii). According to Peplau, a nurse was "an investigator, prober, interpreter, and reporter, using the rich data she extracts from the patient concerning his life. She develops insights, his and hers, into the meaning of a patient's behaviour and helps the patient recognize and change patterns that obstruct achievement of his goals" (Barnum, 1994, p. 217). An early advocate of an orderly and systematic approach to care, Peplau created a way of thinking about nursing care that directed nurses toward preventing illness and maintaining health.

Joyce Travelbee. Writing in the late 1960s and early 1970s, Travelbee also viewed nursing care as an interpersonal process. In contrast to Peplau's more psychoanalytic orientation, Travelbee drew on a school of thought known as *existential philosophy* to guide her theorizing. Travelbee (1971) viewed the "client" as including not only the individual but also the individual's family and community, and she articulated the role of the nurse as assisting clients to "prevent or cope with the experience of illness and suffering and, if necessary, to find meaning in these experiences" (p. 7). Travelbee emphasized that nurses must recognize the humanity of their clients, suggesting that even the term *patient* should be regarded as a stereotypical categorization. Recognizing the reciprocity of human interaction, Travelbee focused attention on the communication that occurs between nurses and their clients as an important vehicle for finding meaning in illness.

Evelyn Adam. Influenced by Dorothy Johnson, as well as by earlier interactionist theorists (George, 1995), Canadian theorist Evelyn Adam (1979, 1980) articulated the essence of nursing as a helping process. From her perspective, the nurse played a complementary-supplementary role in supporting the patient's strength, knowledge, and will. Adam's model drew on Henderson's framework of basic human needs and extended it into a model that would explain not only how nurses conceptualized the patient but also how they applied that knowledge in the context of a helping relationship characterized by empathy, caring, and mutual respect.

Systems Theories

In the 1970s and 1980s, as conceptual models of nursing became more sophisticated and structured, several theorists drew on general systems theory (von Bertalanffy, 1968) for guidance in conceptualizing the complexity of human health. The main appeal of systems theory was that it accounted for the whole of an entity (the system) and its component parts (subsystems), as well as the complex interactions between the parts and the whole. In this way, systems theory allowed theorists to expand the conceptualization of nursing practice through both structure and process, whereby the individual was viewed as an open system in constant interaction with his or her environment. Being outside the system, the nurse became one of the many forces to have an effect on that system. Using this perspective, nurses were encouraged to appreciate the interactions of a system with its component parts and with its environment. Systems approaches helped nurses recognize that intervention in any one part of a system would produce consequent reactions in other parts, as well as in the system as a whole. Regardless of how each theorist depicted the nature of the system, these general principles common to all living systems were featured in each of the nursing systems models.

Dorothy Johnson. Johnson's theoretical work was popularized in the early 1960s through distribution of her class notes and speeches, but it remained unpublished until much later (Grubbs, 1980; Johnson, 1980). In her nursing model, Johnson identified the individual as a behavioural system with seven subsystems, each of which has a goal, a set of behaviours, and a choice. The notion of goals of the subsystems was based on the drives that were considered universal and applicable to all patients. However, the meanings attributed to each goal and the set of behaviours for achieving goals were seen as highly individual and unique to each patient. Together with the choices made by the patient in relation to meeting his or her behavioural system goals, each subsystem also had a function that could be considered analogous to the physiological function of a biological system (Meleis, 2007).

The University of British Columbia Model. The behavioural systems model developed at the University of British Columbia (UBC) School of Nursing was inspired by Johnson's model and developed by a committee led by Margaret Campbell that included several of Johnson's former students. Broadening the view of human experience on the basis of behavioural drives, the UBC model depicted the behavioural system as being composed of nine basic human needs, each of which is shaped by the psychological and socio-cultural environment within which it is expressed (Campbell et al., 1976). Whereas needs were considered universal and therefore fundamental to human experience, the specific goals toward which needs-related human behaviour were directed and the strategies for achieving those goals were recognized as unique to individuals and their particular physiological, psychological, or social circumstances (Thorne et al., 1993). Thus, the UBC model provided a structure by which general knowledge about human health and illness could be combined with particular knowledge about each individual client. In accordance with the tenets of general systems theory, the goal of nursing practice was balance of the behavioural system. The nurse's role was to foster, protect, sustain, and teach (Campbell, 1987) and thereby bring about not only system balance but also stability and optimal health.

Betty Neuman. Neuman's approach to theorizing about nursing differed from that of other systems theorists in that

it did not rely on concepts concerning needs and drives, nor did it break the system into any component parts. Neuman understood the person to be a physiological, psychological, sociocultural, developmental, and spiritual being (Meleis, 2007) and oriented the attention of the nurse to the “client system” in a health care-oriented and holistic manner (Neuman, 1982). Neuman considered the client system to have innate factors consistent with being human, as well as unique factors that characterized each individual person. According to Neuman, each client had a unique set of response patterns determined and regulated by a core structure. Neuman believed that because the person was vulnerable to environmental stressors, the role of the nurse ought to focus on actual and potential stressors. In this way, Neuman’s model focused on prevention.

Sister Callista Roy. In contrast to most other systems theorists, Roy considered the client not as a behavioural system but rather as an adaptive one. She viewed the person as a biopsychosocial being in constant interaction with a changing environment (Roy, 1984). Her model depicted four modes of adaptation: physiological needs, self-concept, role function, and interdependence (Roy, 1974). She conceptualized the person as an adaptive system with two major internal processes by which to adapt: the cognator and the regulator subsystems (Roy & Andrews, 1999). Roy used these mechanisms to describe and explain the interconnectedness of all aspects of human adaptation and to conceptualize the role of the nurse in managing the stimuli that influence that adaptation (Meleis, 2007).

Simultaneity Theories

The theorists who identified their work as belonging to the simultaneity paradigm considered their theories to be fundamentally distinct from the practice, needs, interactionist, and systems theories. Although simultaneity theories were first articulated long before the paradigm debate arose and before the terms *simultaneity* and *totality* were used to categorize the theories, the language of simultaneity has become prominent in distinguishing this group of nursing theories from others. A characteristic feature of these theories is what Rogers (1970) called the *unitary human being*. Previous theorists had sought to identify aspects of the individual that represented not only an abstract conceptualization of the whole but also provided a comprehensive understanding of the person in terms of his or her parts (such as problems, needs, or goals). In contrast, the simultaneity theorists viewed the individual as an entirely irreducible whole, inherently and “holographically” connected with the universal environment (Parse, 2004). Thus, these theories represented a distinctive approach to articulating an understanding of the client of nursing as well as nursing’s role in relation to that client.

Martha Rogers. Martha Rogers’s (1970) model was revolutionary in presenting the client not simply as a person but as an energy field in constant interaction with the environment, which itself was also an irreducible energy field, coextensive with the universe (Meleis, 2007). According to Rogers, who based her theory on her interpretations of evolving ideas in physics, the role of nursing was to focus on the life process of a human being along a time-space continuum (Rogers, 1970). An early proponent of pattern recognition, Rogers believed that pattern gave the energy field its identity and its distinguishing characteristics (Meleis, 2007). The objective of nursing practice became one of helping clients reach their

maximum health potential in the context of constant change and to develop what Rogers referred to as homeodynamic unity within diversity.

Rosemarie Parse. Parse’s (1981) theory of “man-living-health,” later termed *human becoming* (Parse, 1997), was another view of the individual as a unitary being who is “indivisible, unpredictable, and everchanging” and “a freely choosing being who can be recognized through paradoxical patterns cocreated all-at-once in mutual process with the universe” (Parse, 2004, p. 293). According to Parse’s perspective, the caring presences of nurses and their particular patterns of relating support individuals in the human “becoming” process. Within Parse’s nursing theory, the goal of nursing is articulated not in traditional definitions of health but rather as the notion of people in a continuous process of making choices and changing health priorities. According to Parse’s theory, nurses engage with people in their process of “becoming” through the application of three core processes referred to as explicating, dwelling with, and moving beyond (Parse, 1999).

Jean Watson. Watson (1979) considered the individual to be a totality who can be viewed as a transpersonal self. According to Watson, in contrast to depictions of the individual as a body and an ego, it is more useful to understand the individual as “an embodied spirit; a transpersonal transcendent evolving consciousness; unity of mind body spirit; person-nature-universe as oneness, connected” (Watson, 1999, p. 129). Watson therefore believed that nurses must do far more than deal with physical illness: they must attend to their primary function, which is caring. From Watson’s perspective, caring infuses all aspects of a nurse’s role and draws attention to nursing acts as embodying an aesthetic that facilitates both healing and growth (see Chapter 18).

Each of the models just described attracts continual analysis and implementation. In some instances, nurses draw on them holistically as a coherent approach to guide all of their practices. More often, nowadays, nurses consider themselves informed by the intellectual structure that any good framework provides, but typically expand their thinking beyond the limitations of a single model as their practice develops and progresses.

Theorizing in the Future

Theoretical knowledge leads us to reflect on “the basic values, guiding principles, elements, and phases of a conception of nursing” (Meleis, 2007). The goals of theoretical knowledge are to stimulate thinking and create a broad understanding of the science and practice of the nursing discipline (King & Fawcett, 1997). Although nurses today can appreciate the inherent complexity of these objectives, the creativity and vision modelled by these early theorists continue to inspire theorizing about the essence of nursing.

Nursing is solidly established as a distinct health care discipline with its own unique science. In addition, current theorists draw heavily from philosophy to resolve some of nursing’s theoretical challenges. However, as Kikuchi (1999) pointed out, much of the theorizing about the purpose of nursing has confused rather than clarified thinking. As nursing scholarship evolves to include stronger philosophical and scientific inquiry, nursing practice must be conceptualized with increasing clarity (Silva et al., 1995). Nurse philosophers, as well as scientists, are continuing to use new ways of tackling nursing’s

most complex theoretical feature, which is applying expanding, dynamic, and multiple sources of knowledge to a diverse range of client situations. This problem of understanding the general and applying it to the particular features in the work of many contemporary nursing scholars.

Meleis (1987), a scholar of nursing theory, challenged nurses to direct their theorizing away from the processes by which nurses use knowledge and toward the equally challenging issues associated with the substance of that knowledge. In accepting this challenge, many nursing scholars have shifted their theorizing about nursing to include both theoretical and substantive knowledge. Liaschenko (1997; Liaschenko & Fisher, 1999) oriented this theorizing into three levels of abstraction: knowing the case, knowing the patient, and knowing the person. Engebretson (1997) positioned nursing theory in relation not only to biomedicine but also to Eastern and holistic understandings of health and illness. Starzomski and Rodney (1997) worked toward articulating the link between definitions of health and more philosophical notions of the greater social good. Campbell and Bunting (1991) explored the possibilities of using critical social and feminist theories for emancipatory theorizing in nursing. Watson (1990; see also Brenwick & Webster, 2000) developed the idea of embedding “caring” as a moral component into nursing theory. Yeo (1989) considered the implications of ethical reasoning for nursing theory.

The capacity to provide a rationale for nursing actions and decisions based on theoretical knowledge is a recognized core competency for nursing practice in Canada. However, as this review of the history of theorizing in nursing illustrates, linking theory with practice requires a dynamic and evolving skill set. The inherent complexities underlying interrelationships between theory and practice are therefore of increasing interest to nursing scholars.

A dialogue representing the dynamic interaction between theorizing and clinical practice (often termed **praxis**) has started to emerge (Clarke et al., 1996; Mitchell, 1995; Reed, 1995; Reed & Ground, 1997; Thorne, 1997). This newer form of theorizing does not seek static truths about nursing practice as it considers all truths to be potentially illusory. Rather, it seeks to create a coherent foundation upon which nurses can build, challenge, and integrate an infinite range of new ideas, new forms of knowledge, and new paths toward action. For some theorists, this notion of praxis represents a blend of what has been described as the art and science of nursing (Newman, 2002). For others, it reflects a call to engaging with knowledge in a reflexive manner that invokes emancipation and fuels action (Kagan et al., 2010).

As Levine once wrote, “Theory is the poetry of science” (1995, p. 14). In this manner, theorizing in nursing becomes the engine by which ideas about the discipline are advanced over time. It brings the old and familiar concepts of nursing together and shapes them into bold and exciting new configurations, rendering previously disconnected aspects of the human experience part of a greater whole. In so doing, it makes the intellectual excitement of the discipline come alive.

❖ KEY CONCEPTS

- The hallmark of nursing practice is its unique body of knowledge and the way nurses use it.
- Nursing science has evolved within a historical and social context.

- Nursing theory represents the attempts by nursing scholars to articulate ways in which knowledge from multiple sources can be systematically applied in a wide variety of ways to guide professional, accountable, and defensible nursing practice.
- Much of the early theorizing about nursing practice was specifically designed to guide nursing curriculum development so that nursing education would be focused on the knowledge unique to nursing care.
- The nursing process is the fundamental problem-solving process by which new situations are assessed, plans are developed, and interventions are performed and evaluated.
- Nursing care requires the application of general knowledge to an infinite range of unique situations. Nursing process and nursing theory represent strategies to guide the application process.
- The major components of nursing theory, sometimes called the *metaparadigm concepts*, are person, environment, health, and nursing.
- Nurses' understanding of the role of science has changed as more complex forms of science have been articulated by philosophers of science; science is no longer limited to simple relationships such as cause and effect but instead provides strategies for understanding increasingly complex relationships and phenomena.
- Nursing knowledge derives from various sources in addition to science, including aesthetics, personal knowing, sociocultural understanding, and ethics.
- Nursing theorists based their conceptual frameworks on various ways of thinking about human behaviour and experience. Some framed their ideas within theories of human behaviour, such as needs, interaction, or systems, and others drew their primary inspiration from what they observed in excellent nursing practice.
- Nursing conceptual frameworks include those for understanding both the person as the nurse's client and the nurse's role in relation to that client.
- Although each framework may have attempted to organize nursing knowledge and systematic reasoning processes in a different way, each was aiming for a very similar ideal of excellent decision making in nursing practice.
- Although nursing theoretical frameworks are no longer considered useful as prescriptive models for practice, they provide a way of conceptualizing nursing's interests and of identifying researchable nursing problems.
- As the practice of theorizing about nursing care evolves, the role of philosophy in helping nurses understand their relationship to knowledge has become increasingly relevant.

❖ CRITICAL THINKING EXERCISES

1. How do you think that different ways of conceptualizing the client might influence the kinds of decisions that nurses might make in their practice? Consider how understanding the person in terms of needs, system theory, or interaction might lead you to notice certain things and not others.
2. What sorts of gaps in information or misunderstandings might occur if nurses failed to use a systematic way of thinking about each individual in their care?
3. How do you think that conceptual frameworks and nursing theories might be used to generate research questions for developing knowledge for evidence-informed practice?
4. Why is it useful for nurses to question how they know what they think they know?

❖ REVIEW QUESTIONS

1. A theory is a set of assumptions or propositions that is useful because it
 1. Helps people meet their self-care needs
 2. Isolates concepts
 3. Helps the nurse implement care
 4. Provides a systematic view of explaining, predicting, and prescribing phenomena
2. The drive for early theorizing about nursing practice was derived from
 1. Physicians
 2. Political leaders
 3. Nursing educators
 4. Policymakers
3. The nursing process originally involved which four basic steps?
 1. Assessment, planning, intervention, evaluation
 2. Assessment, nursing diagnosis, planning, intervention
 3. Nursing diagnosis, planning, intervention, evaluation
 4. Planning, assessment, intervention, evaluation
4. The metaparadigm concepts included
 1. The person, environment, health, and nursing
 2. The theories of Thomas Kuhn
 3. Chaos theory and games theory
 4. The grounded theory approach
5. The main question confronting early nursing theorists was about
 1. How to differentiate between nursing theories and medical theories
 2. How to reconcile the generalizations of the North American Nursing Diagnoses Association with the unique situations of each client
 3. How to organize and make sense of general nursing knowledge and apply this knowledge to an individual clinical case
 4. Whether to use theories from other disciplines such as philosophy and to apply them to nursing
6. According to Kuhn, scientific advances happen when creative individuals
 1. Approach a problem in a new way
 2. Use the cause-and-effect model to solve problems
 3. Use the work of other scientists to solve problems
 4. Use empirical evidence to solve problems
7. The McGill model
 1. Focuses on health rather than on illness or treatment
 2. Accounts for holistic aspects of the individual, rather than component parts
 3. Views the person as an energy field in constant interaction with the environment
 4. Considers the human experience to be based on behavioural drives
8. Hildegard Peplau considered the essence of nursing to be
 1. The role of the individual in health maintenance
 2. The relationship between the nurse and patient
 3. Advancing nursing theories
 4. Caring
9. Theorist Evelyn Adam articulated the essence of nursing as
 1. A collaboration with health care providers
 2. A helping process
 3. The management of patients and health care systems
 4. All of the above
10. Systems theorists considered the human being to be
 1. An irreducible whole
 2. A whole and component parts
 3. An embodiment of mind, body, and spirit
 4. All of the above
11. Parse's theory relies on
 1. A traditional definition of illness and health
 2. The idea of people engaging in a continuing process of making choices
 3. The notion of nursing as a caring profession
 4. All of the above

❖ RECOMMENDED WEB SITES

Department of Nursing, Clayton State University School of Nursing, "Nursing Theory Link Page": <http://healthsci.clayton.edu/eichelberger/nursing.htm>

This collection offers links to a wide range of nursing theories, including theories of nursing in general and theories about substantive fields within nursing.

Hahn School of Nursing and Health Science, University of San Diego, "The Nursing Theory Page": <http://www.sandiego.edu/academics/nursing/theory/>

This site orients the student to most of the major nursing theorists and resources to expand an understanding of their contributions.

Review Question Answers

1. 4; 2. 2; 3. 1; 4. 1; 5. 3; 6. 1; 7. 1; 8. 2; 9. 6; 10. 2; 11. 2

Rationales for the Review Questions appear at the end of the book.

Research as a Basis for Practice

Original chapter by Patricia A. Potter, RN, MSN, PhD, FAAN

Canadian content written by Marilynn J. Wood, BSN, MSN, DrPH, and Wendy Duggleby, RN, PhD, AOCN

objectives

Mastery of content in this chapter will enable you to:

- Define the key terms listed.
- Differentiate evidence-informed practice from traditional practice.
- Identify methods of locating research findings.
- Discuss how to implement evidence-informed practice.
- Identify the various ways to acquire knowledge.
- Discuss methods for developing new nursing knowledge.
- Define nursing research.
- Discuss Canadian nursing research priorities.
- Identify ethical principles important in undertaking research.
- Explain how the rights of human research subjects are protected.
- Explain how to organize information from a research report.

key terms

- | | |
|--|---|
| Empirical data, p. 74 | Quantitative nursing research, p. 74 |
| Ethnography, p. 75 | Quasi-experimental research design, p. 75 |
| Evidence-informed decision making, p. 66 | Research, p. 71 |
| Evidence-informed practice, p. 66 | Research process, p. 73 |
| Grounded theory, p. 76 | Scientific method, p. 73 |
| Hypothesis, p. 73 | Subjects, p. 74 |
| Informed consent, p. 77 | Surveys, p. 75 |
| Nursing research, p. 71 | True experiment, p. 74 |
| Phenomenology, p. 76 | |
| Qualitative nursing research, p. 75 | |

media resources

evolve WEBSITE

<http://evolve.elsevier.com/Canada/Potter/fundamentals/>

- Audio Chapter Summaries
- Examination Review Questions
- Glossary
- Student Learning Activities
- Weblinks

Rick has been a nurse in the emergency department for more than five years. During that time, the nurses have followed a policy of restricting the presence of family members when patients experience critical events that necessitate resuscitation. This policy allows staff to attend to the patient and administer life-saving care without family interference. The nurses have assumed that the experience of watching a loved one undergoing resuscitation is too traumatic for family members. However, Rick has noticed for some time that the families of resuscitated patients experience significant stress when they are unable to stay with their loved one. Later, after the resuscitation, the families may express anger or resentment toward staff. Rick raises a question with the other nurses in the department: "What if we allowed family presence during resuscitation? What would be the outcomes for the families? Is it possible that families can benefit?"

Rick and the other emergency nurses have been practising according to what they know from their education and experience, as well as the policies and practices of

their hospital. This type of practice may not be based on up-to-date information. Current evidence in the scientific literature is that family presence during resuscitation may have distinct benefits. The considerable number of studies that have been done all demonstrate a positive outcome for the family. In spite of the evidence, however, health care practitioners continue to doubt the value of having families remain with the patient (Critchell & Marik, 2007; McGahey-Oakland et al., 2007). This doubt exemplifies the gap between research and practice.

Why Evidence?

The Canadian Nurses Association (CNA) have defined evidence as information acquired through research and scientific evaluation of practice (CNA, 2010). Evidence then is integrated into the decision making of every nurse. Multiple terms are used to describe the utilization of research by nurses in their practice, such as research-based nursing practice, evidence-based practice, evidenced-based decision making, evidence-informed practice, and evidence-informed decision making. Evidence-based practice is the continuous interactive process of consideration of the best available evidence to provide care (CNA, 2010). **Evidence-informed practice** is the integration of the most informative research evidence with evidence from expert clinical practice, client preferences, professional clinical judgement, and other sources to produce the best possible care for clients. As a result, **evidence-informed decision making** provides a safety net for nurses and other health professionals because it enables them to make accurate, timely, and appropriate clinical decisions.

Nursing knowledge must be expanded continuously to keep approaches to nursing care relevant and current. Without new knowledge, nursing cannot improve therapies such as infant care, pain management, grief counselling, or patient education. The major source of new knowledge is research, which can provide a solid foundation for nursing practice. It is important to translate the best evidence into best practices at a patient's bedside. Nurses need a sound knowledge base to support practice, and research is essential for building that knowledge.

Professional nurses must stay informed about current evidence. This is not easy to do. Students may diligently read the assigned materials from texts and articles and assume they have the latest information. A good textbook incorporates evidence into the practice guidelines it describes. However, it takes about two years for a book to be written, published, and in print; therefore, the scientific literature used in the book can be outdated by the time the book is published. Articles, particularly scientific ones, are more likely to be current, but the findings may not be easily applied. They may be inconclusive, or the particular practice that would incorporate the research may not have been studied yet. Moreover, these articles are not readily available to staff nurses at the bedside. It is a distinct challenge to obtain the best, most current evidence when you need it for patient care.

The sources of information about evidence are well-designed, systematically conducted research studies, found in scientific journals; however, nurses currently have limited access to databases for scientific literature. When no evidence is available, tradition prevails.

Nonresearch evidence is another source of information to support practice. This includes quality improvement and risk

> BOX 6-1

Steps for Successful Evidence-Informed Practice

1. Ask a question that clearly presents the clinical problem.
2. Identify and gather the most relevant and best evidence.
3. Critically appraise the evidence.
4. Integrate all evidence with clinical expertise, patients' preferences, and patients' values to make a practice decision or change.
5. Evaluate the outcome of the practice decision or change.

From Melnyk, B. M., & Fineout-Overholt, E. (2005). *Evidence-based practice in nursing and health care. A guide to best practice*. Philadelphia, PA: Lippincott Williams & Wilkins. Reprinted by permission of Lippincott Williams & Wilkins.

management data; international, national, and local standards; infection control data; chart reviews; and clinical expertise. These sources can be valuable, but their value never approaches that of research evidence.

A third source of evidence that must be incorporated into good clinical decisions consists of individual patients and their values, beliefs, and experience. No efficacious clinical decision can be made without consideration of the uniqueness of the patient.

Much current research focuses on ways to improve the use of new knowledge in practice. Steps to foster success are summarized in Box 6-1.

Researching the Evidence

Ask the Clinical Question

Clinical questions arise out of your practice and represent problems that you wonder about, or things that do not make sense to you. For example, while caring for an unconscious patient, you wonder, "What is the best cleaner to use when I provide mouth care to this patient?" Or you might notice that there has been an increase in patient falls on your unit, leading you to ask, "How can I reduce falls on my unit?"

Clinical questions that arise from your practice should first be addressed by looking to see if the answer is readily available: "What is the current evidence to improve pain management in patients with migraine headaches?" Important sources of this type of information can be found in practice guidelines available from professional associations. All professions have focused on ensuring that service professionals understand practice guidelines. "Best practices" are guiding principles leading to the most appropriate courses of action in certain standard practice situations. They are based on the accumulated research findings, as well as on evidence from practice. This sets best practices apart from the much more general nursing practice standards. Since 1999, the Ontario Ministry of Health and Long-Term Care has given substantial annual funding to the Registered Nurses' Association of Ontario (RNAO) for a project to develop, vet, and disseminate "best practice guidelines" that identify actions in particular patient situations. This is a multiyear project to assist nurses in providing informed and high-quality care (RNAO, 2011). These guidelines are available to all Canadian nurses (Box 6-2).

The questions you ask will eventually lead you to the evidence required for an answer. When you consult the scientific literature for an answer, you want to read the most informative

► BOX 6-2

Selected Nursing Best Practice Guidelines of the Registered Nurses' Association of Ontario

Adult Asthma Care Guidelines for Nurses: Promoting Control of Asthma
Assessment and Care of Adults at Risk for Suicidal Ideation and Behaviour
Assessment and Device Selection for Vascular Access
Assessment and Management of Foot Ulcers for People with Diabetes
Assessment and Management of Pain
Assessment & Management of Stage I to IV Pressure Ulcers—Revised 2007
Assessment and Management of Venous Leg Ulcers
Best Practice Guideline for the Subcutaneous Administration of Insulin in Adults with Type 2 Diabetes
Breastfeeding Best Practice Guidelines for Nurses
Care and Maintenance to Reduce Vascular Access Complications
Caregiving Strategies for Older Adults with Delirium, Dementia and Depression
Collaborative Practice Among Nursing Teams Guideline
Client-Centred Care
Crisis Intervention
Decision Support for Adults Living with Chronic Kidney Disease
Developing and Sustaining Effective Staffing and Workload Practices
Developing and Sustaining Nursing Leadership
Diabetes
Embracing Cultural Diversity in Health Care: Developing Cultural Competence
Enhancing Healthy Adolescent Development
Establishing Therapeutic Relationships
Integrating Smoking Cessation into Daily Nursing Practice
Interventions for Postpartum Depression
Nursing Care of Dyspnea: The 6th Vital Sign in Individuals with Chronic Obstructive Pulmonary Diseases (COPD)
Nursing Management of Hypertension
Oral Care: Nursing Assessment and Interventions
Ostomy Care and Management
Preventing and Managing Violence in the Workplace
Prevention of Constipation in the Older Adult Population
Prevention of Falls and Fall Injuries in the Older Adult
Primary Prevention of Childhood Obesity
Professionalism in Nursing
Promoting Asthma Control in Children
Promoting Continence Using Prompted Voiding
Reducing Foot Complications for People with Diabetes
Risk Assessment and Prevention of Pressure Ulcers
Screening for Delirium, Dementia and Depression in Older Adults
Strategies to Support Self-Management in Chronic Conditions: Collaboration with Clients
Stroke Assessment Across the Continuum of Care
Supporting and Strengthening Families Through Expected and Unexpected Life Events
Supporting Clients on Methadone Maintenance Treatment
Woman Abuse: Screening, Identification and Initial Response
Workplace Health, Safety and WellBeing of the Nurse

See <http://www.rnao.org/Page.asp?PageID=1110&SiteNodeID=190> for links to the abovementioned guidelines.

four to six articles that address your practice question specifically, not be mired in hundreds of articles that might have some relationship to your question. This means that your question must be well stated and focused on just the relevant components of the issue (Stillwell, 2010). Unfocused questions ("What is the best way to reduce wandering?" "What is the best way to measure blood pressure?") are too vague and will lead to many irrelevant sources of information. Melnyk and Fineout-Overholt (2005) suggested using a "PICO" format to state your question. A PICO question has four components: P = Patient population of interest: What are the age, gender, ethnicity, and disease or health problem of the patients? I = Intervention of interest: What is the best intervention (treatment, diagnostic test, prognostic factor)? C = Comparison of interest: What is the usual standard of care or current intervention used now in practice? O = Outcome: What result (e.g., change in patient behaviour, physical finding) do you want to achieve as a result of the intervention?

Do not be satisfied with clinical routines if they do not improve the patient's quality of life. Always question and use critical thinking to consider better ways to provide patient care. The questions you raise by using a PICO format help you identify knowledge gaps within a clinical situation and assist you in making sound clinical decisions for change.

Collect the Best Evidence

Once you have a clear and concise PICO question, you are ready to search for evidence. You can find the evidence you need in a variety of sources: agency policy and procedure manuals, quality improvement data, existing clinical practice guidelines, or bibliographical databases. Always ask for help to find appropriate evidence. Nursing faculty are always a key resource, as are advanced practice nurses, staff educators, and infection control nurses.

When you go to the literature for evidence, a librarian can help you to locate the appropriate databases (Box 6-3). The databases contain published scientific studies, including peer-reviewed research. An article that has undergone peer review has been reviewed by a panel of experts before publication. The search process requires you to come up with keywords or phrases from your PICO question that most accurately describe what you want from the search. The librarian can help you find the language that yields the most informative results. You usually need to adjust the wording of your search criteria until you get the results you want.

The best-known databases for nursing literature are MEDLINE and CINAHL. These are comprehensive databases containing articles from most nursing and health journals. These are usually available at no cost to students through the university or college library.

The pyramid in Figure 6-1 represents the hierarchy of available evidence. At the top of the pyramid are systematic reviews and meta-analyses. These reviews have been conducted by experts in the clinical area, who review the evidence about a specific clinical question or issue and summarize the state of the science. Of primary importance in these reviews are the randomized controlled trials (RCTs) that have been conducted on the topic. On occasion, they include other types of research as well. Later in this chapter, the research process is examined more carefully, and you will find that the majority of nursing research is not at the level of the RCT. Nevertheless, the RCT is considered the "gold standard" in scientific research,

Levels of Research Evidence

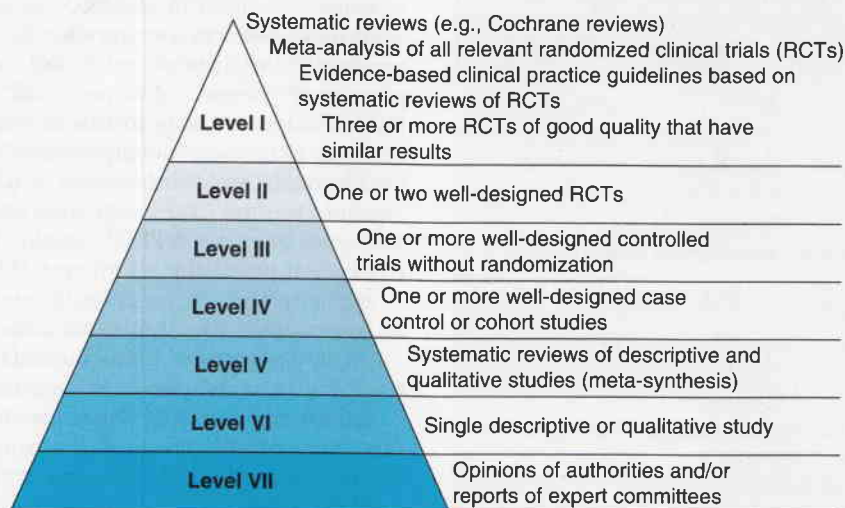


Figure 6-1 Hierarchy of evidence. RCT, Randomized controlled trial. **Source:** Adapted from Ackley, B. J., Ladwig, G. B., Swan, B. A., & Tucker, S. J. (2008). *Evidence-based nursing care guidelines. Medical surgical interventions*. St Louis, MO: Mosby / Elsevier.

BOX 6-3

Searchable Scientific Literature Databases and Sources

Cumulative Index of Nursing and Allied Health Literature (CINAHL): <http://www.cinahl.com>

Includes studies in nursing, allied health, and biomedicine

MEDLINE: <http://www.nlm.nih.gov/bsd/pmresources.html>

Includes studies in medicine, nursing, dentistry, psychiatry, veterinary medicine, and allied health

EMBASE: <http://www.embase.com>

Includes biomedical and pharmaceutical studies

PsycINFO: <http://www.apa.org/pubs/databases/psycinfo/index.aspx>

Contains information in psychology and related health care disciplines

Cochrane Database of Systematic Reviews: <http://www.thecochranelibrary.com/view/0/index.html>

Contains full text of regularly updated systematic reviews prepared by the Cochrane Collaboration; includes completed reviews and protocols

National Guideline Clearinghouse: <http://www.guideline.gov>

Contains structured abstracts (summaries) about clinical guidelines and their development; also includes condensed version of guideline for viewing

PubMed: <http://www.nlm.nih.gov>

Health science library at the US National Library of Medicine; offers free access to journal articles

OnLine Journal of Knowledge Synthesis for Nursing Renamed as World Views on Evidence Based Nursing: [http://onlinelibrary.wiley.com/journal/10.1111/\(ISSN\)1741-6787](http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1741-6787)

Electronic journal; contains articles that provide a synthesis of research and an annotated bibliography for selected references

intervention in managing the blood glucose levels of patients with newly diagnosed diabetes.

Critique the Evidence

The most difficult step in the evidence-informed practice process probably is critiquing or analyzing the available evidence. The critiquing of evidence involves determining its value, feasibility, and utility for changing practice. When you critique evidence, first evaluate the scientific merit and clinical applicability of each study's findings. Then, with a group of studies and expert opinion, determine what findings have a strong enough basis for use in practice. After critiquing the evidence, you will be able to answer the questions, Do the articles together offer evidence to explain or answer your PICO question? Do the articles show that the evidence is true and reliable? Can you use the evidence in practice? Because you are a student and new to nursing, it will take time to acquire the skills to critique evidence like an expert. When you read an article from the literature, do not let the statistics or technical wording cause you to stop reading the article. Know the elements of an article, and use a careful approach when you review each one. Evidence-informed articles include the following elements:

- **Abstract:** An abstract is a brief summary of the article that quickly tells you whether the article is research or clinically based. An abstract summarizes the purpose of the study or clinical query, the major themes or findings, and the implications for nursing practice.
- **Introduction:** The introduction contains information about the purpose of the article and the importance of the topic for the audience who reads the article. Brief supporting evidence is usually presented as to why the topic is important from the author's point of view. Together, the abstract and introduction tell you whether you want to read the entire article. You will know if the topic of the article is similar to your PICO question or related closely enough to provide you with useful information. Continue to read the next elements of the article.

in which the effect of a specific treatment or intervention is tested through the use of experimental and control groups. A systematic review of RCTs in which an intervention (such as computerized interactive patient teaching) is used would answer a PICO question about the effectiveness of this

- *Literature review or background:* A useful article has a detailed background of the existing level of science or clinical information about the topic of the article. Therefore, it offers an argument about what led the author to conduct a study or report on a clinical topic. This section of an article is valuable. Perhaps the article itself does not address your PICO question in the way you desire, but it may lead you to other articles that are more useful. A literature review of a research article indicates how past research led to the researcher's question. For example, an article about a study designed to test an educational intervention for older adult family caregivers reviews literature that describes characteristics of caregivers, the type of factors influencing caregivers' ability to cope with stressors of caregiving, and any previous educational interventions used with families.
- *Manuscript narrative:* "Middle sections," or narratives, of articles differ according to the type of evidence-informed article they are (Melnik & Fineout-Overholt, 2005). A clinical article describes a clinical topic and often includes a description of a patient population, the nature of a certain disease or health alteration, how patients are affected, and the appropriate nursing therapies. Some clinical articles explain how to use a therapy or new technology. A research article will contain several subsections within the narrative, including the following.
 - *Purpose statement:* A purpose statement explains the focus or intent of a study. It identifies what concepts were researched. This includes research questions or hypotheses: predictions made about the relationship or difference between study variables (concepts, characteristics, or traits that vary within or among subjects). An example of a research question is as follows: "What characteristics are common among older adults who have annual breast screening?"
 - *Methods or design:* The methods or design section explains how a research study is organized and conducted in order to answer the research question or to test the hypothesis. This explanation includes the type of study to be conducted (e.g., RCT, case control study, or qualitative study) and how many subjects or persons are in a study. In health care studies, "subjects" may include patients, family members, or health care staff. The language in the methods section is sometimes confusing because it contains details about how the researcher designs the study to minimize bias and thereby obtain the most accurate results possible. Use your faculty member as a resource to help interpret this section.
 - *Results or conclusions:* Clinical and research articles have a summary section. A clinical article explains the clinical implications for the topic presented, whereas a research article details the results of the study and explains whether a hypothesis is supported or how a research question is answered. If the study is quantitative, this section includes a statistical analysis. For a qualitative study, the article presents a thorough summary of the descriptive themes and ideas that arise from the researcher's analysis of data. Do not be stumped by the statistical analysis in an article. Read carefully, and ask whether the researcher describes the results and whether the results were significant. Have a faculty member assist you in interpreting statistical results. A helpful results section also discusses any limitations to a study. This information on limitations is valuable in helping you decide whether you want to use the evidence with your patients.

- *Clinical implications.* A research article includes a section that explains whether the findings from the study have clinical implications. This section also explains how to apply findings in a practice setting for the type of subjects studied. After you have critiqued each article for your PICO question, synthesize or combine the findings from all of the articles to determine the state of the evidence. Use critical thinking to consider the scientific rigour of the evidence and how well it answers your area of interest. Consider the evidence in view of your patients' concerns and preferences. Your review of articles offers a snapshot conclusion that is based on combined evidence about one focused topical area. As a clinician, judge whether to use the evidence for a particular patient or group of patients, who usually have complex medical histories and patterns of responses (Melnik & Fineout-Overholt, 2005). It is ethically important to consider evidence that benefits patients and does no harm. Decide whether the evidence is relevant, is easily applicable in your setting of practice, and has the potential for improving patient outcomes.

Integrate the Evidence

Once you decide that the evidence is strong and applicable to your patients and clinical situation, incorporate the recommended evidence into practice. Your first step is to simply apply the research in your plan of care for a patient. Use the evidence you find as a rationale for an intervention you plan to try. For instance, you learned about an approach for bathing older adults who are restless, and you decide to use the technique during your next clinical assignment. You use the bathing technique with your own assigned patients, or you work with a group of other students or nurses in revising a policy and procedure or in developing a new clinical protocol. In another example, after being concerned about the rate of intravenous catheter dislodgement, you consult the evidence to compare the efficacy of gauze dressings with that of transparent dressings. The literature suggests that fewer catheter dislodgements occur with transparent dressings on peripheral intravenous sites than with gauze dressings, with no increase in phlebitis or infiltration rates (Melnik & Fineout-Overholt, 2005). As a result of your findings, you meet with the policy and procedure committee of your institution to recommend the use of transparent dressings routinely. You then implement the use of transparent dressings in the routine care of peripheral intravenous catheters.

Evidence is useful in a variety of ways in formulating teaching tools, clinical practice guidelines, policies and procedures, and new assessment or documentation tools. Depending on the amount of change needed to apply evidence in practice, it becomes necessary to involve a number of staff from a given nursing unit. It is important to consider the setting in which you want to apply the evidence: Do all staff members support the change? Does the practice change fit with the scope of practice in the clinical setting? Are resources (time, administrative support, and staff) available to make a change? When evidence is not strong enough to apply in practice, your next option is to conduct a pilot study to investigate your PICO question. A pilot study is a small-scale research study or a study that includes a quality or performance improvement project. As a nursing student integrating evidence, your study begins with searching for and applying the most useful evidence to improve the care you provide directly to your patients. The evidence available within nursing literature gives you an

almost unlimited access to innovative and effective nursing interventions. Using an evidence-informed practice approach helps you improve your skills and knowledge as a nurse and improve outcomes for your patients.

Evaluate the Practice Decision or Change

After applying evidence in your practice, your next step is to evaluate its effect. How does the intervention work? How effective was the clinical decision for your patient or practice setting? Sometimes your evaluation is as simple as determining whether the expected outcomes you set for an intervention are met. For example, after the use of a transparent intravenous dressing, does the catheter dislodge, or does the complication of phlebitis develop? When you use a new approach to preoperative teaching, does the patient learn what to expect after surgery?

When an evidence-informed practice change occurs on a larger scale, an evaluation is more formal. For example, evidence of factors that contribute to pressure ulcers might lead a nursing unit to adopt a new skin care protocol. To evaluate the protocol, the nurses track the incidence of pressure ulcers over a course of time (e.g., six months to a year). In addition, the nurses collect data to describe both the patients who develop ulcers and those who do not. This comparative information is valuable for determining the effects of the protocol and whether modifications are necessary.

Support for Evidence-Informed Practice

Nursing practice is based on theory, professional values, and evidence. Nurses base decisions on these factors, as well on other influences such as individual values, ethics, legislation, patient choice, and practice environments. The CNA position statement on evidence-informed decision making specifies its importance in providing quality nursing care, and in effecting change across the health care system. The evidence to be used in practice is derived through research and the scientific evaluation of practice. Types of evidence include experimental studies of nursing interventions, meta-analysis of groups of studies on a particular topic, nonexperimental or observational studies, expert opinion through consensus documents, and historical information. The CNA believes that individual nurses must read and critique evidence-informed literature in order to provide high-quality care to clients (CNA, 2010).

Knowledge Development in Nursing

Knowledge that provides the rationale for nursing practice is organized in a variety of ways. In her classic article on patterns of knowing in nursing, Carper (1978) identified four patterns: “empirics,” or the science of nursing; esthetics, or the art of nursing; personal knowing; and ethics, or the moral component. A fifth type of knowing, emancipatory knowing, was later added by Chinn and Kramer (2008) (Table 6-1). These different types of knowledge focus on the meaning and value of nursing expertise. With evidence-informed practice, the evidence can be derived from any of these sources of knowledge.

Empirics: The Science of Nursing

Carper (1978) described empirics as “knowledge that is systematically organized into general laws and theories for the

► TABLE 6-1

Fundamental Patterns of Knowing in Nursing

Empirics: the science of knowledge	Knowledge developed through systematic research to describe and explain phenomena
Esthetics: the art of nursing	Creativity, with an artistic or expressive component
Personal knowledge	Knowledge derived from the depth and power of the interpersonal relationship with the patient
Ethics: the moral component	Knowledge that emerges from ethical dilemmas and is based on what ought to be done in particular situations
Emancipatory knowing: the social, economic, and political component	Knowledge that allows change to occur

From Carper, B. A. (1978). Fundamental patterns of knowing in nursing. *Advances in Nursing Science*, 1(1), 13; and Chinn, P., & Kramer, M. (2008). *Integrated theory and knowledge development in nursing* (p. 78). St Louis, MO: Mosby/Elsevier.

purpose of describing, explaining and predicting phenomena of special concern to the discipline of nursing” (p. 14). This pattern of knowing implies an objective reality; by studying this, you can interpret the meaning of particular phenomena and develop understandings of other similar phenomena. Fundamental to this model is the rational stance in which you can generalize from a sample to a population. The theoretical or conceptual models and frameworks help explain particular phenomena in health and illness and identify important questions for nursing research. The goal of scientific research is to produce this type of knowledge.

Esthetics: The Art of Nursing

Nursing incorporates an artistic, expressive component, which involves knowledge and understanding. As Carper (1978) noted, “The art of nursing involves the active transformation of the patient’s behavior into a perception of what is significant in it—that is, what need is being expressed by the behavior” (p. 17). She further stated that perception is beyond mere recognition and, as such, moves nursing activities into the esthetic realm. Qualitative research often explores this area.

Personal Knowledge

This pattern of knowing can be the most difficult to understand and to teach. The nature of the relationship formed with the patient and the depth and quality of the interpersonal experience are fundamental to the realm of personal knowledge. As Carper (1978) stated, “Personal knowledge is concerned with the knowing, encountering and actualizing of the concrete, individual self” (p. 18). Many investigators have attempted to understand the nature of therapeutic relationships. Through the rapport established with the patient, how does a nurse succeed in assisting that patient to reach health goals? Perhaps “the nurse in the therapeutic use of self rejects approaching the patient-client as an object and strives instead to actualize an authentic personal relationship between two persons” (Carper, 1978, p. 19). The knowledge gleaned from experience belongs to this pattern.

Ethics: The Moral Component

Nurses are faced with ethical questions that centre on what ought to be done in particular situations. Ethics goes beyond ethical theories, principles, and codes of professional conduct to include dilemmas such as choosing the better of two or more somewhat unsatisfactory actions. Now that technology can prolong life, ethical dilemmas have become more frequent and complex. As Carper (1978) stated, "The ethical pattern of knowing in nursing requires an understanding of different philosophical positions regarding what is good, what ought to be desired, and what is right; of different ethical frameworks devised for dealing with the complexities of moral judgements; and of various orientations to the notion of obligation" (p. 21).

Emancipatory Knowing: The Social, Economic, and Political Component

Emancipatory knowing makes it possible to create social and structural change (Chinn & Kramer, 2008). It represents the ability to recognize social and political problems of injustice or inequity, to picture how things could be different, and to figure out how to change a difficult situation into one that improves the lives of people. Nurses have dealt with emancipatory knowledge since the nineteenth century, when Florence Nightingale wrote passionately about the inequities in society affecting women. As described by Chinn and Kramer, "Emancipatory knowing is the capacity not only to notice injustices in a social order, but also to critically examine why injustices seem not to be noticed or remain invisible, and to identify social and structural changes that are required to right social and institutional wrongs" (p. 78).

Nurses benefit from all these ways of knowing. According to the concept of evidence-informed practice, evidence gained from any and all of these means guides nurses to make sound clinical decisions. The knowledge gained from empirics is but one pattern of knowledge, but with it, you can build strength and confidence as you pursue research into nursing questions.

The Development of Research in Nursing

Research is the primary means by which new knowledge is discovered and brought into practice to improve the care that nurses provide to their patients. It is a systematic process in which questions that generate knowledge are asked and answered. This knowledge becomes part of the scientific basis for practice and may be used to validate interventions.

Nursing research is a systematic examination of phenomena important to the nursing discipline, as well as to nurses, their patients, and families. Its purpose is to expand the knowledge base for practice by answering nurses' questions. Nursing research addresses a range of issues related to actual and potential patient populations and to individual and family responses to health problems. Some research tests nursing theories; other research generates theory from findings. This "back-and-forth" relationship between theory and research is the way knowledge develops in any discipline (Wood & Ross-Kerr, 2011). In the current health care environment, nursing research is frequently undertaken in multidisciplinary teams, in which nurses examine factors relevant to nursing in the context of the larger health care picture. The scientific knowledge needed for nursing practice is discovered, tested, and enhanced through nursing research. The multidisciplinary

nature of nursing challenges nurses not only to keep up with nursing research but also to know the status of research in other health disciplines, as well as in the behavioural, social, and physical sciences.

The International Council of Nurses (ICN) (ICN, 2007) is a staunch supporter of nursing research as a means to improve people's health and welfare. Research is a way to identify new knowledge, improve education and practice, and use resources effectively. In 1999, the ICN established the ICN Research Network. The network provides a means for sharing research ideas, results, and progress around the world. Network members communicate with one another through the ICN Web site, as well as at annual conferences.

Nursing research improves nursing practice, raising the profession's standards. Involvement in research takes many forms, including designing studies, being on a research team, collecting data, and using research findings to change clinical practice, improve patient outcomes, and contain health care costs (Cleary-Holdforth, 2009). Promoting research and using it in practice increases the scientific knowledge base for nursing practice. Patients benefit from these improvements to practice.

The History of Nursing Research in Canada

During the Crimean War, Florence Nightingale's detailed and systematic observation of nursing actions and outcomes resulted in major changes in nursing practice (Box 6-4). Her work demonstrated the importance of systematic observational research to nursing practice.

In Canada, the establishment of university nursing courses starting in 1918, followed by master's degree programs in the 1950s and 1970s and by doctoral programs in the 1990s and 2000s, was crucial to the development of nursing research. The first master's degree program, established at the University of Western Ontario in 1959, highlighted the need for Canadian research capacity in nursing.

The first nursing research journal, *Nursing Research*, was launched in the United States in 1952. The first nursing research journal published in Canada, *Nursing Papers* (later the *Canadian Journal of Nursing Research*), was established at McGill University in 1969. Other journals were later established, and today, nurses publish their research, both within nursing and in interdisciplinary fields, in hundreds of journals.

Since the 1970s and 1980s, the two major factors in the development of nursing research have been the establishment of research training through doctoral programs and the establishment of funding to support nursing research. Throughout the 1970s and 1980s, university faculties and schools of nursing built their research resources so that they could establish doctoral programs. The first provincially approved doctoral nursing program was established at the University of Alberta Faculty of Nursing in 1991. Another was established at the University of British Columbia School of Nursing later that year, and programs at McGill University and the University of Toronto followed in 1993. Between 1993 and 2008, other programs were launched, which brought the total across Canada to 12.

Growing awareness of the importance of nursing research gradually led to the availability of research funds. The year 1964 marked the first time that a federal granting agency funded nursing research in Canada (Good, 1969). In 1999, 14 years after the U.S. government had established funding for

► BOX 6-4 Historical Milestones in the Development of Canadian Nursing Research

1858	Florence Nightingale published <i>Notes on Matters Affecting the Health, Efficiency and Hospital Administration of the British Army and Notes on Hospitals</i> (1863).	1990	Francine Ducharme was the first nurse to graduate with a PhD in nursing from a Canadian university, through a special case program at McGill University.
1918	The University of British Columbia launched the first baccalaureate nursing program in Canada.	1991	The first Canadian nursing PhD program was launched at University of Alberta, followed by one at University of British Columbia.
1952	The American Nurses Association first published the journal <i>Nursing Research</i> .	1992–1994	PhD programs in nursing were launched at McGill University, University of Toronto, and McMaster University.
1959	The first Canadian nursing master's degree program was launched at the University of Western Ontario.	1992	The MRC mandate was revised to include health research.
1964–1965	The first nursing research project was funded by a Canadian federal granting agency; the <i>International Journal of Nursing Studies</i> and <i>International Nursing Index</i> were launched.	1999	The Nursing Research Fund was launched with a \$25-million grant over 10 years; the Canadian Health Services Research Foundation administered the funds. PhD program in nursing was launched at the University of Calgary.
1969–1970	Nursing Papers, forerunner of the <i>Canadian Journal of Nursing Research</i> , was published at McGill University; Lysaught's (1970) report, <i>An Abstract for Action</i> , recommending increased research in education and practice, was published.	2003–2008	PhD programs in nursing were initiated at Dalhousie University, the University of Victoria, the University of Western Ontario, the University of Ottawa, l'Université Laval, and l'Université de Sherbrooke.
1971	McGill University launched the Centre for Nursing Research; the first national Canadian conference was held on nursing research; both were financed by the Department of National Health and Welfare.	2004	A forum on doctoral education was held in Toronto under the auspices of Canadian Association of Schools of Nursing to develop a national position paper on the PhD in nursing for Canada.
1975	The Commission on Canadian Studies noted that the slow start of graduate programs in Canada and inadequate funding, resulted in few studies in nursing.	2007	<i>Nursing Research in Canada: A Status Report</i> was commissioned by the Canadian Consortium for Nursing Research, which included representatives from Canadian Nurses Association, Canadian Association of Schools of Nursing, Canadian Nurses Foundation, Academy of Canadian Executive Nurses, and the Canadian Association of Nurse Researchers. This report made recommendations for the future of nursing research.
1978	The heads of university nursing schools and deans of graduate studies attended the Kellogg National Seminar on Doctoral Education in Nursing.	2008	The first nurse researcher was appointed as scientific director of the CIHR Institute of Gender and Health. Dr. Joy Johnson works with the Canadian gender, sex, and health research community and stakeholders to identify research priorities, develop research funding opportunities, strengthen research capacity, build partnerships, and translate research evidence to improve the health of Canadians.
1982	The Alberta Foundation for Nursing Research, the first funding agency for nursing research, was established; the Working Group on Nursing Research was established by the Medical Research Council (MRC).		
1985	<i>Report of the Working Group on Nursing Research</i> was released by the MRC (Medical Research Council of Canada, 1985).		
1988	The MRC and the National Health Research and Development Program established a joint initiative to structure nursing research grants.		

nursing research under the National Institutes of Health, the Canadian government established the Nursing Research Fund, budgeting \$25 million for nursing research (\$2.5 million over each of the following 10 years); the funds were to be administered by the Canadian Health Services Research Foundation. The research areas targeted for support included nursing policies, management, human resources, and nursing care. A total of \$500,000 each year is designated for the Open Grants Competition, \$500,000 to the Canadian Nurses Foundation for research on nursing care, \$750,000 for training (postdoctoral fellowships and student grants), and \$250,000 for knowledge networks and dissemination activities. Five chairs in nursing research, representing excellence in nursing research across Canada, were funded by this initiative. The incumbents were to develop research capacity in a particular area of nursing:

- Dr. Lesley Degner, University of Manitoba: Development of Innovative Nursing Interventions to Influence Practice

and Policy in Cancer Care, Palliative Care, and Cancer Prevention

- Dr. Alba Dicenso, McMaster University: Evaluation of Nurse Practitioner/Advanced Practice Nurse Roles and Interventions
- Dr. Nancy Edwards, University of Ottawa: Multiple Interventions in Community Health Nursing Care
- Dr. Janice Lander, University of Alberta: Evaluating Innovative Approaches to Nursing Care
- Dr. Linda O'Brien-Pallas, University of Toronto: Nursing Human Resources for the New Millennium

Nursing research has focused progressively on evidence-informed practice in response to demands to justify care practices and systems by improving patient outcomes and controlling costs. The scope of nursing research has also broadened to include historical and philosophical inquiry. The establishment of the Institute for Philosophical Nursing

Research at the University of Alberta and the Nursing History Research Unit at the University of Ottawa exemplify this new direction.

Three new training centres funded by the Nursing Research Fund at the Canadian Health Services Research Foundation were mandated to increase research capacity in nursing and related disciplines:

- The Centre FERASI (<http://www.ferasi.umontreal.ca>) in Quebec is a joint initiative among l'Université de Montréal, McGill University, and l'Université Laval to build research capacity in the administration of nursing services. It focuses on developing partnerships with health care decision makers in order to provide training opportunities and insights into the decision-making environment. Funding is provided for student scholarships.
- The Ontario Training Centre in Health Services and Policy Research (<http://www.otc-hsr.ca>) involves six Ontario universities in enhancing health services and policy research. The centre is located at McMaster University and involves collaboration with the University of Toronto, York University, the University of Ottawa, Laurentian University, and Lakehead University.
- The Centre for Knowledge Transfer was designed as a national training centre at the University of Alberta, providing funding for students and offering courses in knowledge utilization and transfer. This centre is now closed.

Nursing Research

In a mature discipline, practitioners use various research methods to develop a unique knowledge base (Wood and Ross-Kerr, 2011). A person continuously acquires knowledge, using critical thinking to interpret and evaluate complex information. Current research can be classified into one of two ways of thinking: scientific or qualitative (interpretive). Both have a great deal to offer when you are seeking evidence to support your practice.

The Scientific Paradigm

The term *paradigm* was introduced by Kuhn (1970) and can be loosely defined as a way of thinking (see Chapter 4). According to Kuhn, a dominant research paradigm can be identified

during any one era. Eventually, this paradigm no longer provides solutions to research problems and is challenged by new ideas. It is then replaced by a new paradigm, and the process continues. The dominant paradigm for most of the nineteenth and twentieth centuries has been positivism. Positivism emphasizes tested and systematized experience, rather than speculation, and focuses on the search for cause-and-effect relationships to explain phenomena. In this paradigm, the **scientific method** arose as the major research approach.

Researchers who use the scientific method pose research questions and collect and analyze data to find answers to the questions. The process is rigorous and systematic and is guided by scientific principles, the most important of which is empiricism, which means that only things that can be observed by the human senses can be called *facts*. The focus is on deductive reasoning, in which a **hypothesis** is tested experimentally to confirm or reject theoretical explanations of phenomena.

The scientific method is characterized by systematic, orderly procedures that, although not without fault, are intended to limit the possibility of error and minimize the likelihood that any bias or opinion by the researcher might influence the results of research and, thus, the knowledge gained. Wood and Ross-Kerr (2011) describe the **research process** as follows: the process begins with a researchable question. If properly stated, the question guides the rest of the process; thus, asking the question is a crucial step. Three levels of questions exist, and the appropriate level is chosen based on how much is known about the research topic. Once an initial question has been formulated, the literature is searched to discover what is already known about the topic and to determine whether the question must be revised in light of prior knowledge. The level of the question determines the research design needed to answer it. Table 6-2 describes the basic steps in planning nursing research.

The research design provides the ground rules for data collection and analysis, ensuring that the research question will have a valid answer. The design steps are systematic and precise in order to control unwanted influences that might affect the answer. For example, in a study of the relationship between diet and heart disease, influences such as stress or smoking must be controlled because they are known to

► TABLE 6-2 Basic Steps in Planning Nursing Research

Steps	Level I	Level II	Level III
Question	What?	What is the relationship?	Why?
Problem	Little known about topic	Conceptual base; variables have been studied before	Theoretical base
Purpose	Declarative statement	Question or hypothesis	Hypothesis
Design	Exploratory descriptive	Descriptive survey, correlational or comparative	Experiment
Sample	Convenience sample or total population	Probability sample	Random assignment to treatment and control groups
Methods	Qualitative, unstructured data; some quantitative descriptive data	Quantitative data collected by all methods	Quantitative data
Analysis	Content analysis; descriptive statistic	Correlation or tests of association; regression analysis	Differences between means: test, analysis of variance (ANOVA)
Answer	Description of processes, concepts, or population	Explanation of relationship among variables	Test of theory

Adapted from Wood, M., & Ross-Kerr, J. (2011). *Basic steps in planning nursing research: From question to proposal*. Sudbury, MA: Jones & Bartlett.

influence heart disease. The design also specifies the type of sample and sample selection techniques that will provide the most useful data for the study.

Evidence that is part of experience (**empirical data**) is gathered from the sample through measurement techniques that quantify the variables in the research question. Techniques include interviews, tests of knowledge, and physiological measures such as heart rate and blood pressure. When the evidence is analyzed, the result answers the original question and becomes the basis for discovering new knowledge.

A goal of scientific research is to understand phenomena so that the knowledge gained can be applied generally, not just to isolated cases. Researchers achieve this goal by studying a sample that represents a larger population; this increases the likelihood that the results will apply across that population. In the scientific paradigm, researchers conduct studies that contribute to the testing or development of theories, thereby advancing knowledge that can be applied in nursing practice.

The Qualitative (Interpretive) Paradigm

Positivism has been criticized by those academics who believe that reality and people's perception of reality are so intertwined that they cannot be separated. Interpretivism is an alternative to positivism, representing the view that people construct their own world as they strive to make sense of their social environments (Speziale et al., 2010). The research that is driven by interpretivism can be broadly designated *qualitative research*. Qualitative research avoids the empirical notion of the study of people as objects and strives instead to understand human behaviour in the context of the people being studied. A qualitative researcher studies the behaviours, experiences, perceptions, and motives of individuals in social and cultural settings (Speziale et al., 2010).

Several approaches to qualitative research exist, and each is very different from the others. Unlike the scientific approach, many qualitative approaches have their own unique philosophical base, which makes comparisons difficult. Speziale et al. (2010, p. 21) identified the following six characteristics common to all qualitative research:

- Belief in multiple realities
- Commitment to identifying an approach to understanding that will support the phenomenon studied
- Commitment to the participant's point of view
- Conduct of inquiry in a way that does not disturb the natural context of the phenomena of interest
- Acknowledged participation of the researcher in the research
- Conveyance of the understanding of phenomena by reporting in a literary style rich with participants' commentary

The idea of multiple realities is a challenge to positivist thinking, which proposes that researchers are searching for one reality or truth. Interpretivists say that because the experience of each individual is unique, each individual can come to know the world differently, which implies that many truths exist, rather than one. This belief leads qualitative researchers to seek multiple ways of understanding the world and to change methods and data collection strategies as needed, rather than following a single prescribed set of strategies. It follows that the participant's point of view would be the focus of the research and would guide the process. The researcher becomes a co-participant in the process of understanding the participant's point of view.

Qualitative research is carried out in the participants' natural setting to maintain a natural context. The researcher is a participant and acknowledges that being a participant will affect the other participants and the setting. Objectivity is not a goal in qualitative research; rather, subjectivity from the participants' perspective is sought. Because of the nature of the data, rich with personal experience and example, the research is usually reported in a literary style, similar to storytelling. Liberal quotation from the participants adds to the detail of the report.

Research Designs

Nursing research approaches vary, depending on the specific problem to be studied. The paradigms of positivism and interpretivism lead to two research approaches, often categorized as quantitative and qualitative. Neither is used exclusively in nursing research. The research approach used is the one that is considered the best one to answer the research question. The next section describes some common research designs in these two categories.

Quantitative Nursing Research

Quantitative nursing research is the investigation of nursing phenomena that can be precisely measured and quantified. Examples are pain severity, rates of wound healing, and body temperature changes. These designs fall within the positivist paradigm and provide rigorous, systematic, objective examination of specific concepts and their relationships. The goal is to test theory and use numerical data, statistical analysis, and controls to eliminate bias (Polit & Beck, 2010; Wood & Ross-Kerr, 2011).

Experimental Research. Experimental design is the hallmark of quantitative research. Experiments are appropriate designs for questions at level III (see Table 6-2), which concern why one variable causes a predictable change in another variable. In a **true experiment**, the conditions under which the variables are studied are tightly controlled to provide objective testing of hypotheses, which predict cause-and-effect relationships. Experimental research requires that the data be collected and quantified in a prescribed manner.

The requirements of a true experiment are as follows:

- The study usually includes at least one control or comparison group that does not receive the nursing treatment or intervention being investigated. The results for this group are compared with those of the experimental group, which is the group that receives the treatment or intervention. The **subjects**—people selected for the comparison and experimental groups—are randomly assigned to these groups, so that the groups are as similar as possible to each other before the intervention. Random assignment of subjects ensures that all subjects have the same chance to be in the control or experimental (treatment) group and that variables that could affect the outcome of the study are randomly distributed between the groups and therefore are no more likely to affect experimental subjects than to affect control subjects.
- An experimental variable must be manipulated by the researcher. For example, in a study of the effect of preoperative teaching on postoperative anxiety, the researcher manipulates preoperative teaching by providing it for the experimental group but not for the control group. The expectation is that the differences in postoperative anxiety

measures between the two groups can be attributed to the effect of preoperative teaching because all other factors are under control. However, the researcher cannot control subjects' prior experiences, such as hearing other patients' stories about surgery. Psychological factors, which cannot be controlled, may influence a subject's level of anxiety. If subjects are randomly assigned to the two groups, however, those with negative prior experiences should be distributed equally between the two groups, and these experiences would affect both groups equally. Thus, differences between the groups in postoperative anxiety can still be attributed to the preoperative teaching intervention.

- The researcher proposes theory-based and statistically tested hypotheses about the action of the variables to answer the research question. For example, in a study of preoperative teaching, the hypothesis might be as follows: "Patients who receive interactive preoperative teaching will have significantly lower postoperative anxiety levels than will patients who receive other teaching methods." The researcher must explain why a lower anxiety level is expected in a discussion of the theory behind the study.

A **quasi-experimental research design** is one in which groups are formed and the conditions are controlled, but the subjects are not randomly assigned to a control group or to treatment conditions. These designs also answer level III questions (Wood & Ross-Kerr, 2011). In many health care settings, assigning subjects randomly to experimental and control groups is not feasible. Quasi-experimental research is often carried out for practical reasons related to the subjects themselves. For example, to test the effect of a new intervention in the care of patients with Alzheimer's disease, carrying out two treatments on the unit at the same time might confuse the subjects. A quasi-experiment could entail the use of two care units: one as the experimental unit, in which all subjects receive the new intervention, and the second as the control group, in which subjects receive the usual care but not the new intervention. The two groups are compared before and after the intervention with regard to the outcome variable. The weakness in a quasi-experiment is that the researcher does not know whether the two groups were equivalent before the intervention. Unrecognized differences between the two units might exist that could influence the outcome of the study. For instance, subjects in one unit might have more cognitive impairment than do those in the other unit, and this difference could influence the outcome.

Descriptive Survey Designs. Surveys are designed to answer level II questions about relationships among variables. The research question that leads to a survey design begins with "What is the relationship between . . . ?" and addresses two or more variables (Wood and Ross-Kerr, 2011): for example, the relationship between ethnicity and suicide among university students.

In many types of research, investigators use surveys in which people in a group are compared with regard to two or more variables. The purpose is to discover relationships among variables in the population. In a survey design, the sample determines whether the survey yields informative or uninformative results. The sample should be representative of the population so that generalizations can be made on the basis of the sample data. Surveys contain three key elements. First, a random sample of the population must be drawn, from which inferences can be made about the population. Second, the population sampled should be large enough to keep sampling

error to a minimum. Third, the measurement tools (e.g., questionnaires, interviews) must yield accurate measurements of the study variables.

Exploratory Descriptive Designs. Exploratory descriptive designs provide in-depth descriptions of populations or variables not previously studied. Level I (basic) questions are asked because not much is known about the topic. They typically begin with "what"; for example, "What are the health-promoting behaviours of older adults living in subsidized housing?" The results provide a detailed description of the variable or population. No relationships among variables are posited at this stage, although the results might indicate that relationships should be examined in subsequent research.

Data Analysis. Except for some exploratory descriptive studies in which the outcome is a verbal description, all quantitative studies entail the use of statistical analysis. In experimental designs, researchers must discover whether the experimental and control groups are significantly different from each other after the intervention has been applied. Statistical tests that provide a test of group means are generally used for experiments.

Descriptive survey designs entail the use of statistical techniques to test for significant relationships among the variables. In general, these are correlational tests that indicate whether one subject's score on one variable (e.g., blood pressure) is related to the same subject's score on another variable (e.g., weight). The results of a correlational analysis of these two variables would reveal how much influence increased body weight has on blood pressure.

Exploratory descriptive studies entail the use of several techniques to analyze data, depending on the type collected. Unstructured data that do not lend themselves to numerical form are summarized verbally. If quantitative measures are used to collect the data, they can be described both numerically and verbally. Descriptions usually include measures of central tendency (mean, median, or mode) and dispersion (range, standard deviation).

Qualitative Nursing Research

Qualitative nursing research poses questions about nursing phenomena that cannot be quantified and measured. To answer questions about these phenomena, researchers must understand the perspective of the person in the situation. Researchers using qualitative methods can choose one of many design strategies. Examples of three qualitative designs (ethnography, phenomenology, and grounded theory) are discussed in the following sections, but keep in mind that many other qualitative approaches, such as participatory action research, interpretive descriptive research, and narrative inquiry, are used in nursing research. As with scientific research, the research question is the basis for the choice of design. In addition, each of the various qualitative methods has its own unique underlying philosophy. Ethnography is chosen if the research question leads to the study of behaviour within a specific group or culture, phenomenology if the question relates to the lived experience of the participants, and grounded theory if the question is about a social process.

Ethnography. Ethnography involves the observation and description of behaviour in social settings and is derived from anthropology, where it provides the means to study the culture of groups of people. Anthropologists use participant observation as the major source of data collection, together with other sources such as artifacts and photographs. Nurse

researchers use ethnography to study the behaviour of nurses and their patients in a variety of settings. The goal of ethnography is to understand the culture of the study population as the culture is practised in its own setting. The focus is on the cultural norms and social forces that shape behaviour in a given setting. The researcher becomes an accepted member of the community under study and collects data through repeated interviews of informants from the community. Data collection continues until understanding has been reached about why the members of the community behave as they do. Interview data are supplemented by other forms, such as artifacts and historical documents; the result is a detailed description of the culture. For example, Lauzon Clabo (2008) examined nursing pain assessment practice across two units, to seek variation that might exist and to examine the impact of the social context on pain assessment practice. The ethnographic analysis revealed a predominant pattern of pain assessment on each unit that was profoundly shaped by the social context of the unit.

Phenomenology. The focus of **phenomenology** is on the lived experience of a specific phenomenon from the perspective of the people who are in the situation. Phenomenology has its roots in German philosophy of the early twentieth century, stemming from the philosopher Edmund Husserl (1931–1962), who posited that only people who experience phenomena are capable of communicating these experiences. The researcher must learn to understand a phenomenon from the viewpoint

of people experiencing it. For example, an investigator may want to study the impact of surrogate decision making regarding end-of-life decisions (Weigand, 2008). The goal of this research is to describe fully the lived experience of family when life support is withdrawn. This included their experience in making the decision and the meaning of the decision to withdraw life support. The source of the data is the subject, and the data are the result of in-depth conversations. The units of analysis are the conversations, which are coded and analyzed to extract the meaning to the subjects of the phenomenon.

Grounded Theory. Grounded theory as a research method was developed by Glaser and Strauss (1967) as a means of generating hypotheses and theories about social processes inductively from the data. The grounded theory is “discovered,” developed, and verified through a rigorous process of data collection and analysis. Glaser and Strauss advocated that researchers not review the literature before carrying out the study because they might be influenced by what others have found. The strength of the grounded theory approach comes from examining the situation afresh and opening up the possibility of a new perspective on an old problem.

For example, Duggleby et al. (2009) studied the hope experience of family caregivers of persons with dementia using grounded theory (Box 6-5). The social process was identified as “renewing everyday hope” stemming from the continuous loss and threats to their hope on a daily basis and their choice

* BOX 6-5 RESEARCH HIGHLIGHT

Renewing Everyday Hope: The Hope Experience of Family Caregivers of Persons With Dementia

Research Focus

The study (Duggleby et al., 2009) was carried out by a multidisciplinary team of researchers to explore the hope experience of family members caring for a person with dementia.

Research Abstract

The purpose of this grounded theory study was to explore the experience of hope for family members caring for a person with dementia. Little was known about the topic as only one study had been previously published about hope with this population. The research question was: What is the hope experience of family members caring for a person with dementia? The specific aims were to explore the experience and processes of hope and construct a tentative, emerging theory of the hope experience of family members caring for persons with dementia. This study was approved by a Research Ethics Board of the University of Saskatchewan and the Sunrise Health Region.

The study was conducted in the homes of family members caring for a person with dementia. Participants were eligible to be in the study if they were (a) men or women, (b) 18 years of age or older, (c) the primary caregivers of a person diagnosed with dementia who were receiving home services and long-term care services in a Canadian western health region, and (d) English speaking. A purposive and theoretical sampling approach was used to reach saturation (the data were rich and there were no new ideas arising from the data).

Seventeen family members caring for persons with dementia were interviewed twice using open-ended questions, followed by questions adapted to the individual responses. The trained research data collector

used an interview guide. This guide included questions such as (a) Tell me about hope. (b) What gives you hope? (c) What kinds of things change (increase or decrease) your hope? and (d) What can others do to help you have hope? Interviews lasted 45 to 60 minutes and were audiotaped, after which they were transcribed verbatim. Data were analyzed as they were collected.

The findings suggested that the participants described their hope as the possibility of a positive future within their daily lives. Hope was experienced in the context of grief and loss, stress, fatigue, and constantly dealing with challenging behaviours of the person with dementia. The participants' main concern was “fading hope,” which they dealt with by “renewing everyday hope.” The process of “renewing everyday hope” was achieved through (a) coming to terms with their situation, (b) connecting with others, (c) finding positives, (d) seeing possibilities, and (e) making choices.

The findings reflected the importance of hope in the participants' lives to help deal with their caregiving experience. They described how every day they physically and mentally lean on their hope. Those whose hope was fading may need the support of health care providers to renew their hope.

Implications for Practice

- The findings suggest that hope should be assessed by health care providers.
- Fostering hope may be an important part of supporting family caregivers.
- The emerging theory through its subprocesses suggests several ways to assist caregivers to foster hope, such as weighing positive and negatives, connecting with others, setting goals, and making choices.

Reference: Duggleby, W., Williams, A., Wright, K., & Bollinger, S. (2009). Renewing everyday hope: The hope experience of family caregivers of persons with dementia. *Issues in Mental Health Nursing*, 30(8), 514–521. doi:10.1080/01612840802641727.



Figure 6-2 Nurses collaborating on research. **Source:** © image100/Alamy.

to renew their hope. They described almost physically leaning on their hope every day to continue caring for their relative with dementia.

Conducting Nursing Research

Nurses conduct research in a variety of settings. Student nurses and practitioners participate in investigations of patient outcomes and nursing care, commonly called *quality assurance* or *improvement studies*. Data are collected to determine the influence of nurses on achievement of patient care objectives in a particular clinical setting. Because the results usually apply only to one facility, this research is not scientific. However, it is important to the facility involved because the study can demonstrate the contributions made by nurses to patient care and the facility can improve processes if necessary.

Clinical nursing research should be undertaken by nurses educated to conduct scientific investigations (Figure 6-2). An experienced researcher is usually more qualified than a beginner to undertake a complex, long-term project. Nurses new to research may, however, assist with data collection, conduct replication studies (studies previously performed elsewhere), or conduct less complex studies.

Ethical Issues in Research

Research must meet ethical standards in ways that respect the dignity and preserve the well-being of human research participants. In Canada, every health care facility and university receiving public funds for research must meet federal standards for protecting human research participants. The most recent standard is the *Tri-Council Policy Statement* (Canadian Institutes of Health Research et al., 2010), which requires that the institution have in place a research ethics board (REB) to review all research proposals to determine whether ethical principles are being upheld (Box 6-6). The REB focuses on **informed consent** and weighs benefits versus harms from the research. No research may be performed in a university or health care facility without the approval of the REB. All proposals are subject to review. However, if data collection processes (such as quality assurance studies) are a normal part of institutional business, performance reviews, or testing within normal educational requirements and are not for research purposes, they are exempt from REB review.

► BOX 6-6

Guiding Ethical Principles for Research in Canada

1. *Respect for human dignity:* All research must be conducted in a manner that is sensitive to the inherent worth of human beings.
2. *Respect for persons:* Includes the obligation to respect autonomy of human research subjects and at the same time to protect those with developing, impaired, or diminished autonomy.
3. *Concern for welfare:* Researchers and Ethics Review Boards should aim to protect the welfare of participants and when possible promote their welfare.
4. *Respect for privacy and confidentiality:* Standards of privacy and confidentiality protect the access, control, and dissemination of personal information and thus help protect mental or psychological integrity. These standards are consonant with values underlying privacy, confidentiality, and anonymity.
5. *Justice:* This principle reflects the importance of treating people fairly and equitably. This treatment includes ensuring that research participants are not unduly burdened by research or denied access to the benefits of research.

Adapted from Canadian Institutes of Health Research, the Natural Sciences and Engineering Research Council of Canada, & the Social Sciences and Humanities Research Council of Canada. (2010). *Tri-Council policy statement: Ethical conduct for research involving humans* (2nd ed.). Retrieved from http://pre.ethics.gc.ca/pdf/eng/tcps2/TCP2_FINAL_Web.pdf.

To refine existing knowledge and develop new knowledge, investigators in clinical research sometimes use new procedures whose outcome is doubtful or unknown. This research may seem to conflict with the purpose of nursing practice, which is to meet specific patients' needs. In such cases, the investigator must structure the research to avoid or minimize harm to the subjects. Although not all undesirable effects can be anticipated, investigators are obligated to inform everyone involved about the known potential risks. Other basic human rights must also be observed. These principles are set forth by the CNA (2008). Procedures for obtaining informed consent must be outlined in the study protocol. The consent form must describe in lay language the purpose of the study, the role of the subjects, types of data that are to be obtained, how the data are obtained, the duration of the study, subject selection, procedures, risks to the subject (including financial risks), potential benefits (including the possibility of no benefit), alternatives to participation, and contact information concerning the principal investigator and local REB. The consent process gives subjects complete information regarding the study's risks, benefits, and costs so that they can make an informed decision.

The REB also determines whether the investigator has the necessary knowledge and skills to undertake the research, including familiarity with the clinical area in which the data will be collected and sufficient research training and experience. For example, a nurse planning a study of psychiatric patients should be familiar with psychiatric nursing principles and theory, as well as research procedures for data collection and analysis.

Rights of Other Research Participants

Student nurses and practising nurses may be asked to participate in research as data collectors or may be involved in the care of patients participating in a study. All participants, including health care providers, have the right to be fully

informed about the study, its procedures (including the consent process and risk factors), and physical or emotional injuries that patients could experience as a result of participation. Often, the physical risks are more obvious than the emotional risks. For example, patients may be asked to give highly personal, intrusive information; some may find this experience stressful. The researcher should prepare all participants, including nurses delivering care, for this possibility and assist them in coping with the effects. Participants also have the right to see review forms from the REB that certify approval of the study. Participants can refuse to perform research procedures if they are concerned about ethical aspects.

Applying Research Findings to Nursing Practice

Research evidence as a basis for scholarly, professional decision making in clinical practice is essential for providing competent, efficient, and state-of-the-art nursing care (Brown et al., 2009). Advances in care through research are meaningless unless they are accessible to nurses at the point of care. You make links between research findings and nursing care by reading relevant literature, identifying appropriate clinical problems, and incorporating evidence-informed practice activities into the nursing practice of your nursing unit or agency.

In a policy statement, the CNA (2010) stated that evidence-informed decision making by registered nurses is key to quality nursing practice. Nurses need not only skills to access and appraise existing research but also scientific knowledge and skills to change practice settings and to promote evidence-informed decisions about patient care.

Evidence-informed nursing practice deemphasizes ritual, isolated, and unsystematic clinical experiences; ungrounded opinion; and tradition as bases for nursing practice. It stresses the use of research findings and, as appropriate, quality improvement data, other evaluation data, and the consensus of recognized experts and affirmed experience to support a specific practice (Cleary-Holdforth, 2009). Many aspects of health care are not justly served by the research in only one discipline. The expertise of several disciplines must be brought to bear on complex health issues. Just as nurses play a vital role on the health care team, so they are crucial to multidisciplinary health research. Policymakers in the broader arena of health care must account for nursing practice, which is so essential to patient care. Nurses need a sound knowledge base to support practice, and research is essential for building that knowledge.

❖ KEY CONCEPTS

- Nursing knowledge has five patterns: empirics, esthetics, personal knowledge, ethics, and emancipatory knowledge.
- A scientific investigation is an orderly, planned, and controlled study of real-life situations that tests theories and whose results can be applied to general situations.
- In nursing research, physical or psychosocial responses of people of all ages in various states of health and illness are examined.
- In an experimental research study, investigators control factors that could influence the results, include comparison and experimental treatment groups of subjects, and use random means for selecting study subjects.
- In a qualitative research study, investigators organize information in narrative format so that phenomena can be described and patterns of relationships can be discovered.

- When human subjects participate in research, the researcher must obtain informed consent of study subjects, must maintain the confidentiality of subjects, and must protect subjects from undue risk or injury.
- When summarizing data reported in a research study, the nurse should note when, how, where, and by whom the investigation was conducted and who and what were studied.
- A researchable clinical nursing problem is one that is not satisfactorily resolved by current nursing interventions, occurs frequently in a particular group, can be measured or observed, and has a possible solution within the realm of nursing practice.
- To determine whether research findings can be used in nursing practice, the nurse considers the scientific worth of the study by substantiating evidence from other studies, the similarity of the research setting to the nurse's own clinical practice setting, the status of current nursing theory, and factors affecting the feasibility of application.

❖ CRITICAL THINKING EXERCISES

1. The nurse is concerned about learning to properly treat a pressure ulcer. Explain the benefits to the patient if the nurse learns how to treat the sore by drawing from information in the research literature rather than using the scientific method.
2. The research literature reflects many different methods for treating pressure ulcers. If you wished to determine the best method for doing this, what type of research design would you use?
3. The nurses working on an orthopedic unit decide to study the factors that commonly result in patients' falling in their unit. How could they design a study to answer their questions?

❖ REVIEW QUESTIONS

1. The first provincially approved doctoral program in nursing was established in
 1. 1969
 2. 1974
 3. 1982
 4. 1991
2. Empirics is described by Carper (1978) as
 1. The artistic expression of knowledge
 2. Knowledge derived from the interpersonal relationship with the patient
 3. Knowledge derived from ethical dilemmas
 4. Knowledge systematically organized into general laws and theories
3. The quantitative research approach is characterized by
 1. Systematic procedures that seek to limit error and eliminate bias
 2. Studies of behaviours, experiences, perceptions, and motives
 3. A commitment to the participants' point of view
 4. The use of the participants' natural setting
4. If the research question leads to the study of behaviour within a specific culture, the design chosen is
 1. Phenomenology
 2. Grounded theory
 3. Ethnography
 4. Quantitative research

5. Subjectivity is the goal of
 1. Positivism
 2. Qualitative research
 3. True experiments
 4. Quantitative research
6. Which research method is quantitative?
 1. Grounded theory
 2. Phenomenology
 3. Ethnography
 4. Quasi-experimental research
7. A sample in a survey design
 1. Is the main component of qualitative research
 2. Should be representative of the population surveyed
 3. Should be small enough to keep sampling error to a minimum
 4. Should be no different from the control group
8. Procedures for obtaining informed consent do *not* include
 1. Describing the purpose of the study
 2. Describing the role of the subjects
 3. Giving the names of other participants in the study
 4. Describing the risks that the subject may incur
9. In a quasi-experimental research design, subjects are assigned to
 1. An empirical group
 2. An ethnographic group
 3. Either a control group or a treatment condition, but not randomly
 4. An experimental group

10. Evidence-informed practice
 1. Enables the transfer of clinical practice techniques into a positivist paradigm
 2. Requires that evidence be always research based
 3. Is synonymous with research-based practice
 4. Entails the use of knowledge based on research studies and takes into account a nurse's clinical experience and patient preferences

❖ RECOMMENDED WEB SITES

Canadian Nurses Association: <http://www.cna-aiic.ca/>

This Web site contains information about policies and position statements for nursing research in Canada, as well as information about research funding.

Canadian Nurses Foundation: <http://www.cnf-fiic.ca/>

This Web site provides information about available research funding and about scholarships for students.

Canadian Institutes of Health Research: <http://www.cihr-irsc.gc.ca/e/193.html>

This Web site contains information on evidence-based informed decision making, evidence-based practice and using research in practice (knowledge translation).

The Canadian Health Services Research Foundation: <http://www.chsrf.ca>

This Web site contains information about funding for health services research.

Canadian Institutes of Health Research (CIHR): <http://www.cihr.ca>

This Web site contains pages for all 13 CIHR institutes.

Review Question Answers

1. 4; 2. 4; 3. 1; 4. 3; 5. 2; 6. 4; 7. 2; 8. 3; 9. 3; 10. 4

Rationales for the Review Questions appear at the end of the book.

Nursing Values and Ethics

Canadian content written by Shelley Raffin Bouchal, RN, PhD

Based on original chapter by Margaret Ecker, RN, MS

objectives

Mastery of content in this chapter will enable you to:

- Define the key terms listed.
- Discuss the role of values in the study of ethics.
- Examine and clarify personal values.
- Discuss how values influence patient care.
- Explain the relationship between ethics and professional nursing practice.
- Describe some basic ethical philosophies relevant to health care.
- Apply a method of ethical analysis to a clinical situation.
- Identify contemporary ethical issues in nursing practice.

key terms

- | | |
|---------------------------------|-----------------------------|
| Accountability, p. 83 | Environment, p. 86 |
| Advance directives, p. 89 | Ethical dilemma, p. 86 |
| Adverse events, p. 90 | Ethics, p. 80 |
| Advocacy, p. 83 | Informed consent, p. 89 |
| Answerability, p. 83 | Justice, p. 85 |
| Applied ethics, p. 84 | Medical futility, p. 89 |
| Autonomy, p. 85 | Metaethics, p. 84 |
| Beneficence, p. 85 | Moral distress, p. 90 |
| Bioethics, p. 85 | Moral integrity, p. 90 |
| Biomedical ethics, p. 84 | Moral residue, p. 90 |
| Care theory, p. 86 | Mutuality, p. 86 |
| Code of ethics, p. 80 | Nonmaleficence, p. 85 |
| Consequentialism, p. 84 | Normative ethics, p. 84 |
| Constrained moral agency, p. 84 | Relational ethics, p. 86 |
| Cultural values, p. 81 | Responsibility, p. 82 |
| Descriptive moral theory, p. 84 | Social justice, p. 85 |
| Deontology, p. 84 | Teleology, p. 84 |
| Embodiment, p. 86 | Utilitarianism, p. 84 |
| Engagement, p. 86 | Value, p. 80 |
| | Values clarification, p. 81 |
| | Whistle blowing, p. 91 |

media resources

evolve WEBSITE

<http://evolve.elsevier.com/Canada/Potter/fundamentals/>

- Audio Chapter Summaries
- Examination Review Questions
- Glossary
- Student Learning Activities
- Weblinks

Values and ethics are inherent in all nursing acts. A **value** is a strong personal belief and an ideal that a person or group (such as nurses) believe to have merit. **Ethics** is the study of the philosophical ideals of right and wrong behaviour based on what you think you ought (or ought not) to do. The term also commonly refers to the values and standards that individuals and professions strive to uphold (e.g., health care ethics, nursing ethics). In other words, ethics are a reflection of what matters most to people or professions. Nurses and other health care providers agree to national codes of ethics that offer guidelines for responding to difficult situations that occur in practice and demonstrate to the public an overview of professional practice standards. For example, the Canadian Nurses Association (CNA, 2008) publishes a **code of ethics** that outlines nurses' professional values and ethical commitments to their patients and the communities they serve.

Because of their prominent and intimate role in the provision of health care, nurses continually make decisions about the correct course of action in different circumstances. In many situations, no answer or course of action is best. To manage such difficult situations, nurses need a keen awareness of their values and those of their patients, a good understanding of ethics, and a sound approach to ethical decision making. They also must be guided by a broader understanding of ethics through the application of philosophies, theories, and sets of principles.

Values

Values are at the heart of ethics. Values influence behaviour on the basis of the conviction that a certain action is correct in a certain situation. An individual's values reflect cultural and social influences, relationships, and personal needs. Values vary among people, and they develop and change over time. In the context of beliefs about morality, values generate rights and duties.

In nursing, value statements express broad ideals of nursing care and establish reasonable directions for practice. The CNA (2008, pp. 8–18) *Code of Ethics for Registered Nurses* is organized around seven values that are central to ethical nursing practice. These values include providing safe, compassionate, competent, and ethical care; promoting health and well-being; promoting and respecting informed decision making; preserving dignity; maintaining privacy and confidentiality; promoting justice; and being accountable. Each provincial nursing association also has shared values, such as those held in position statements and practice standards. These standards reflect the values of the profession and clarify what is expected of you as a practising nurse.

Because of the intimacy of the nurse–patient relationship, you must be aware of your personal values, as well as the values of patients, physicians, employers, or other groups. To understand the values of others, it is important to understand your own values: what they are, where they came from, and how they relate to others' values.

Values Formation

People acquire values in many ways, beginning in early childhood. Throughout childhood and adolescence, people learn to distinguish right from wrong and to form values on which to base their actions. This is known as *moral development* (see Chapter 22). Family experiences strongly influence value formation.

Values are also learned outside the family. A person's culture, ethnic background, and religious community strongly influence that person's values, as do schools, peer groups, social media, and work environments. **Cultural values** are those adopted as a result of a social setting (see Chapter 9). A basic task of the young adult is to identify personal values within the context of the community. Over time, the person acquires values by choosing some values that are strongly upheld in the community and by discarding or transforming others. A person's experience as well as lack of experience also influences his or her values.

Values Clarification

Within the context of nursing, several layers of values inform the ethical questions and actions that you consider in your practice. Clarifying your values helps you articulate what

► BOX 7-1 Values Clarification Questions

Describe a situation in your personal or professional experience in which you felt uncomfortable, in which you believed that your beliefs and values were being challenged, or in which you believed your values were different from others'.

- As you record the situation, mention how you felt physically and emotionally at the time you experienced the situation.
- Write down your feelings as you remember the situation. Are your current reactions any different from those when you were actually in the situation?
- What personal values do you identify in the situation? Try to remember where and from whom you learned these values. Do you completely agree with the values, or do you question some aspect of the values, or do you wonder about their validity?
- What values do you think were being expressed by others involved? Are they similar to or different from your own values?
- What do you think you reacted to in the situation?
- Can you remember having similar reactions in other situations? If you do, how were the situations similar or different?
- How do you feel about your response to the situation? If you could repeat the scenario, would you change something about it? Rewrite the scenario with the same changes. What might be the consequences of these same changes?
- How do you feel about the new scenario?
- What do you need to do to reinforce behaviours, ideals, beliefs, and qualities that you have identified as personal values in this situation? When and how can you do this?

From Burkhardt, M. A., & Nathaniel, A. K. (2007). *Ethics and issues in contemporary nursing* (3rd ed.). Albany, NY: Thomson Delmar Learning. Copyright © Delmar, a part of Cengage Learning, Inc. Reproduced by permission (www.cengage.com/permissions).

matters most and what priorities are guiding your life and decision making. Values influence how you interpret confusing or conflicting information. Values change as you mature and experience new situations. As you become more aware and reflective about who you are, you may consider embracing or modifying your value set. As a result, you may modify your attitudes and behaviour. The willingness to change reflects a healthy attitude and an ability to adapt to new experiences.

To adopt new values, you must be aware of your existing values and how they affect behaviour. **Values clarification** is the process of appraising personal values (Box 7-1). It is not a set of rules, nor does it suggest that certain values should be accepted by all people; rather, it is a process of personal reflection. When you clarify your values, you make careful choices. The result of values clarification is greater self-awareness and personal insight.

By understanding your personal values, you will become more sensitive to the values of others. In *value conflict*, personal values are at odds with those of a patient, a colleague, or an institution. Values clarification plays a major role in resolving these dilemmas. In addition, you can better advocate for a patient when you can identify your personal values and the values of the patient.

Enhancing your skill of values clarification opens possibilities to help patients identify their personal priorities, values, and emotions. This may help patients resolve conflicts between values and behaviours. The goal of values clarification with patients is for honest and open dialogue. As the patient becomes more willing to express concerns and feelings, you

can collaborate with the patient in developing an individualized plan of care.

Relational communication is a useful way in which to clarify values with a patient. Strategies that promote the process of connecting can be effective. For example, responding to a patient by repeating the patient's sentence as a question ("You wish you could be at home?") encourages the patient to continue the story. Instead of asking questions that can be answered by only yes or no, you can encourage the patient to answer in greater detail. For example, rather than asking, "Do you want to live at home with your daughter?" the nurse might say, "Tell me how you feel about living at home with your daughter."

Relational communication can encourage the patient to examine personal thoughts and actions. When you make a clarifying response, it should be brief and nonjudgemental. For example, when talking with a patient who exercises only rarely, you might ask, "What is your understanding of the purpose of exercise?" A supportive clarifying response encourages the patient to think about personal values after the exchange is over and does not impose your own values onto the patient. In this way, you respect the patient's values and avoid inappropriately introducing personal values into the conversation.

Values clarification plays a key role in communication. In particular, when the topic concerns issues of personal health, private habits, and quality of life, participants in a discussion benefit from clarity of values. In appreciating values, you can identify differences between personal opinion and the values that others embrace. Through values clarification, you can better serve the needs of patients, especially when values differ. By demonstrating respect for the patient's differences and helping the patient to clarify values, you are practising responsibly and ethically.

Ethics

Ethics is the study of good conduct, character, and motives. It is concerned with determining what is good or valuable for all people. Often the terms *ethics* and *morals*, or *morality*, are used interchangeably (Johnstone, 2009), inasmuch as both words are derived from an original meaning of "custom or habit." Johnstone suggested that it is not incorrect to use these terms interchangeably and that the choice is a matter of personal preference rather than of philosophical debate. The classic textbook definition of *ethics* is a "generic term for various ways of understanding and examining the moral life" (Beauchamp & Childress, 2009, p. 1). Essentially, ethics requires you to be critically reflective, exploring your values, behaviours, actions, judgements, and justifications (Beauchamp & Childress, 2009, p. xii). In this chapter, the terms *ethics* and *morals* are used interchangeably.

Nursing and Ethics

Codes of Ethics. A "code of ethics serves as a foundation for nurses' ethical practice" (CNA, 2008, p. 3) and is accepted by all members of a profession. The code is a statement of the ethical values of nurses and of nurses' commitments to patients with health care needs and patients who receive care. It is intended for nurses in all contexts and domains of practice (individuals, families, communities, and public health care systems) and at all levels of decision making. The code developed by nurses for nurses serves the profession

when questions arise about practising ethically and working through ethical challenges (CNA, 2008). The code embodies the collective wisdom of our profession, institution, or community. The nursing code of ethics, as in other professions, sets forth ideals of conduct.

"The code provides guidance for ethical relationships, responsibilities, behaviours and decision-making and it is to be used in conjunction with professional standards, laws, and regulations that guide practice" (CNA, 2008, p. 4). It does not provide rules of behaviour for every circumstance. Situations are unique to the context in which they occur. The environment or institution can greatly influence the values that you are encouraged to uphold. Furthermore, a code does not offer guidance as to which values should take priority or how to balance them in practice.

The CNA and the International Council of Nurses (2006) have established widely accepted codes for nurses that reflect the principles of responsibility, accountability, and advocacy (Boxes 7-2 and 7-3).

Responsibility. Responsibility refers to the characteristics of reliability and dependability. It implies an ability to distinguish between right and wrong. In professional nursing, responsibility includes a duty to perform actions adequately and thoughtfully. When administering a medication, for example, you are responsible for assessing the patient's need for the drug, for administering it safely and correctly, and for evaluating the patient's response to it. By agreeing to act responsibly, you gain trust from patients, colleagues, and society.

► BOX 7-2

Canadian Nurses Association Code of Ethics

The following is the CNA's statement of the seven values that must be upheld in nursing practice. The complete code of ethics also includes responsibility statements outlining how nurses can incorporate these values into their practice; it can be found on the CNA Web site (see the "Recommended Web Sites" section at the end of this chapter).

Providing Safe, Compassionate, Competent, and Ethical Care

Nurses provide safe, compassionate, competent, and ethical care.

Promoting Health and Well-Being

Nurses work with patients to enable them to attain their highest level of health and well-being.

Promoting and Respecting Informed Decision Making

Nurses recognize, respect, and promote a patient's right to be informed and make decisions.

Preserving Dignity

Nurses recognize and respect the intrinsic worth of each patient.

Maintaining Privacy and Confidentiality

Nurses recognize the importance of privacy and confidentiality, and they safeguard personal, family, and community information obtained in the context of a professional relationship.

Promoting Justice

Nurses uphold principles of justice by safeguarding human rights, equity, and fairness in promoting the public good.

Being Accountable

Nurses are accountable for their actions and answerable for their practice.

Adapted from Canadian Nurses Association. (2008). *Code of ethics for registered nurses*. Ottawa: Author.

► BOX 7-3

International Council of Nurses: The Code of Ethics for Nurses

Nurses have four fundamental responsibilities: to promote health, to prevent illness, to restore health, and to alleviate suffering. The need for nursing care is universal. Inherent in nursing care is respect for human rights, including cultural rights, the right to life and choice, the right to dignity, and the right to be treated with respect. Nursing care is respectful of and unrestricted by considerations of age, creed, culture, disability or illness, gender, sexual orientation, nationality, politics, race, economic status, or social status. Nurses render health services to the individual, the family, and the community, and they coordinate their services with those of related groups.

Nurses and People

The nurse's primary professional responsibility is to patients who require nursing care. In providing care, the nurse promotes an environment in which the human rights, values, customs, and spiritual beliefs of the individual patient, family, and community are respected. The nurse ensures that the individual patient receives sufficient information on which to base consent for care and related treatment. The nurse keeps the patient's personal information confidential, sharing it only with appropriate other professionals. The nurse shares with society the responsibility for initiating and supporting action to meet the health and social needs of the public, particularly those of vulnerable populations. The nurse also shares responsibility to sustain and protect the natural environment from depletion, pollution, degradation, and destruction.

Nurses and Nursing Practice

The nurse carries personal responsibility and accountability for nursing practice and for maintaining competence by continual learning. The nurse maintains a standard of personal health in such a way that the ability to provide care is not compromised. The nurse uses judgement regarding individual competence when accepting and delegating responsibility. The nurse at all times maintains standards of personal conduct that reflect positively on the profession and enhance public confidence. In providing care, the nurse ensures that the use of technology and scientific advances is compatible with the safety, dignity, and rights of patients.

Nurses and the Nursing Profession

The nurse assumes the major role in determining and implementing acceptable standards of critical nursing practice, management, research, and education. The nurse is active in developing a core of research-based professional knowledge. The nurse, acting through the professional organization, participates in creating and maintaining equitable social and economic working conditions in nursing.

Nurses and Co-workers

The nurse sustains a cooperative relationship with co-workers in nursing and other fields. The nurse takes appropriate action to safeguard patients when their care is endangered by a co-worker of the nurse or by any other person.

Adapted from International Council of Nurses. (2006). *ICN code of ethics for nurses*. Geneva, Switzerland: Author. Reprinted by permission of International Council of Nurses.

Nurses in all domains of practice uphold responsibilities related to all the values in the code of ethics. You are responsible in your interactions with individual patients, families, groups, populations, communities, and society, as well as with students, nursing colleagues, and other health care colleagues.

These responsibilities serve as the foundation for articulating nursing values to employers, other health care providers, and the public (CNA, 2008).

Accountability. Accountability is grounded in the moral principles of fidelity (faithfulness) and respect for the dignity, worth, and self-determination of patients and others with whom nurses work. As accountable professionals, "nurses are honest and practice with integrity in all of their professional interactions" (CNA, 2008, p. 18). **Accountability** means being able to accept responsibility or to account for one's actions and refers to being answerable to someone for something one has done. **Answerability** means being able to offer reasons and explanations to other people for aspects of nursing practice. When explanations are not readily available to patients, you might seek advice of other health care providers or search for evidence that would support best practice. You balance accountability to the patient, the profession, the employer, and society. For example, you may know that a patient who will be discharged soon is confused about how to self-administer insulin. The action that you take in response to this situation is guided by your sense of accountability. The patient, the institution, and society rely on your judgement and trust you to take action in response to this situation. You may request more hospitalization to provide further teaching, or you may arrange home care to continue teaching at home. The goal is the prevention of injury to the patient. Your sense of accountability guides actions that achieve this goal.

According to the CNA (2008), nurses who are enacting professional accountability are (1) keeping up with professional standards, laws, and regulations; (2) ensuring that they have the skill to provide these practices; (3) maintaining their fitness to practise, ensuring that they have the necessary physical, mental, and emotional capacity to practise safely and competently; and (4) sharing their knowledge with other nurses through mentorship and giving feedback to other nurses when appropriate.

Professional accountability is also the mandate of professional associations. Professional associations both check unethical practice in a profession and support conscientious professionals who may be under pressure to act unethically or to overlook unethical activity by colleagues. Professional nursing associations have the authority to register and discipline nurses. They also set and maintain professional standards of practice and communicate them to the public. These standards, developed by nursing clinical experts, provide a basic structure against which nursing care is objectively measured.

Advocacy. The ethical responsibility of **advocacy** means acting on behalf of another person, speaking for persons who cannot speak for themselves, or intervening to ensure that views are heard. The CNA (2008) advises nurses to advocate for all patients in their care. This includes protecting the patient's right to choice by providing information, obtaining informed consent for all nursing care, and respecting patients' decisions. Nurses should protect patients' right to dignity by advocating for appropriate use of interventions in order to minimize suffering, intervening if other people fail to respect the dignity of the patient, and working to promote health and social conditions that allow patients to live and die with dignity. Nurses should protect a patient's right to privacy and confidentiality by helping the patient access his or her health records (subject to legal requirements), intervening if other members of the health care team fail to respect the patient's

privacy, and following policies that protect the patient's privacy. According to the *Code of Ethics*, nurses should also advocate for the discussion of ethical issues among health care team members, patients, and families, and nurses should advocate for health policies that enable fair and inclusive allocation of resources.

Advocacy requires that you have a strong awareness of the context in which situations arise, as well as an understanding of the influence of power and politics on how you make decisions. If you experience **constrained moral agency**—that is, if you feel powerless to act for what you think is right, or if you believe your actions will not effect change—then you will have difficulty being an effective advocate.

Ethical Theory

Ethics concern the examination of the moral basis for judgments, actions, duties, and obligations. For centuries, moral philosophers have tried to answer perplexing questions that help us understand the world. They structure this understanding in the form of philosophical theories. Different branches of philosophy answer different questions you are grappling with. The field of ethics, also called moral philosophy, addresses questions like “What is the meaning of right and good, or ought and should?” **Descriptive moral theory** explains what people do or think about moral issues. For example, a descriptive theory might emerge from studies of how nurses make moral decisions. Such theory describes the rules, principles, and values that people apply when making moral decisions or judgments in different situations. Taking this one step further, philosophers ask, “Do we believe this is the right way to make moral decisions, just because many people do it this way?” Answering that question requires an understanding of what the “right” way would be. This understanding is called **metaethics**. A person studying metaethics might ask if “good” is socially related, an expression of emotion, or the will of a higher power, such as God. Is “good” out there to be discovered, or is it really socially constructed? Is there a true “right,” and on what moral basis can moral judgments be assessed as being true or false?

Another branch of moral philosophy is **normative ethics**. A normative ethical theory is prescriptive, in that it tells us how we ought to think about moral questions. Normative ethical theory presents us with rules, values, and principles that allow us to judge the quality and the way we make and evaluate decisions, based on our obligations to others. Normative theories question or reveal our obligations as nurses. These are clearly stated in the *Code of Ethics for Registered Nurses*.

Applied ethics (or practical ethics) looks at how decisions should be made in particular situations, asking questions about what moral belief and values should apply in specific contexts. Theories that address issues of right or ought in applied ethics move across disciplines. Applied ethics specific to nursing helps us to examine our practice and how our behaviours are shaped by our practice as nurses. A nurse might reflect on how medical technology changes the way she communicates with family regarding nutrition at the end of life. The following section introduces a variety of contemporary ethical theories. It is neither exclusive nor comprehensive.

Deontology. A traditional ethical theory, **deontology** is the system of ethics that is perhaps most familiar to practitioners in health care. Its foundations are often associated with the work of the eighteenth-century philosopher Immanuel

Kant (1724–1804). In deontology, actions are defined as right or wrong on the basis of their right-making characteristics such as fidelity to promises, truthfulness, and justice (Beauchamp & Childress, 2009). The essence of right or wrong is located within deontological principles. Deontologists specifically do not look to consequences of actions to determine rightness or wrongness. Instead, they critically examine a situation for the existence of essential rightness or wrongness. Ethical principles such as justice, allowing free choice (autonomy), and doing the greatest good (beneficence) serve to define right or wrong. If an act is just, respects autonomy, and provides good, then the act is ethical. The process depends on a mutual understanding and acceptance of these principles.

Difficulty arises when you must choose among conflicting principles, which is often the case in ethical dilemmas concerning health care. For example, applying the principle of respect for autonomy can be confusing when dealing with the health care of children. The health care team may recommend a treatment, but a parent may disagree with or refuse the recommendation. In discussion of the dilemma, you may refer to a guiding principle such as respect for autonomy. However, questions remain: Whose autonomy should receive the respect? That of the parents? Who should advocate for the child's best interest? Society often struggles to understand who should be ultimately responsible for the well-being of children. A commitment to respect autonomy does not guarantee that controversy can be avoided.

Utilitarianism. According to a utilitarian system of ethics, the value of something is determined by its usefulness. This philosophy, **utilitarianism**, may also be known as **consequentialism** because its main emphasis is on the outcome or consequence of action. A third term associated with this philosophy is **teleology** (from the Greek word *telos*, meaning “end”), which is the study of ends or final causes. Its philosophical foundations were first proposed by John Stuart Mill (1806–1873), a British philosopher and social commentator. The greatest good for the greatest number of people is the guiding principle for determining the correct action in this system. As with deontology, this theory relies on the application of a certain principle, namely measures of “good” and “greatest” (Beauchamp & Childress, 2009). The difference between utilitarianism and deontology is in the focus on consequences or outcomes. Utilitarianism concerns the effect that an act will have; deontology concerns the presence of principle, regardless of outcome.

Individuals or groups may have conflicting definitions of “greatest good.” For example, research suggests that education regarding safer sex practices may reduce the spread of the human immunodeficiency virus. Some scholars argue, however, that education about sex should be provided by the family and that sex education in public schools diminishes the role and the value of the family. For them, the greater good is the preservation of family values and the protection of individual choices regarding sex education of children. For other scholars, however, the “greater good” is defined as educating the greatest number of people in the most effective way possible. The concepts of utilitarianism provide guidance, but they do not invariably provide for universal agreement.

Bioethics. In the 1970s, a group of ethics scholars concluded that then-current ethical theories were not sufficient for the health care field because they did not provide specific guidance for important moral questions that arose in the context of medicine. **Biomedical ethics** came to denote ethical reasoning

for physicians, whereas **bioethics** became the general term for principled reasoning across health care professions. Bioethical theory is obligation-based, outcome-oriented, and based on reason (Oberle & Raffin Bouchal, 2009). The central idea of bioethics is that moral decision making in health care should be guided by four principles: autonomy, beneficence, nonmaleficence, and justice. According to this theory, health care providers should examine each situation, determine which of the principles has priority, and use that principle to guide action.

Autonomy. **Autonomy** refers to your ability to make choices for yourself that should be based on full understanding, free of controlling influences (Beauchamp & Childress, 2009). Respect for another person's autonomy is fundamental to the practice of health care. It is the reason why patients should be included in all aspects of decision making regarding their care. The agreement to respect autonomy involves the recognition that patients are free to make choices and have the capacity to do so. Health care providers assess patient capacity and help to facilitate decision making. For example, the purpose of the preoperative consent that patients must read and sign before surgery is to ensure in writing that the health care team respects the patient's choice by obtaining permission to proceed. The consent process implies that a patient may refuse treatment, and in most cases, the health care team must agree to follow the patient's wishes. Health care providers agree to abide by a standard of respect for the patient's autonomy, which comes directly from Kant's ethics and his idea of respect for persons.

Beneficence. **Beneficence** means doing or promoting good for others. It speaks directly to the duty or obligation, as in deontological theories. Commitment to beneficence helps guide difficult decisions concerning whether the benefits of a treatment may be challenged by risks to the patient's well-being or dignity. For example, vaccination may cause temporary discomfort, but the benefits of protection from disease, both for the patient and for society, outweigh the patient's discomfort. The agreement to act with beneficence also requires that the best interests of the patient remain more important than self-interest. For example, you do not simply follow medical orders; you act thoughtfully to understand patient needs and then work actively to meet those needs.

Nonmaleficence. **Maleficence** refers to harm or hurt; thus **nonmaleficence** is the avoidance of harm or hurt. The health care provider tries to balance the risks and benefits of a plan of care while striving to cause the least harm possible. This principle is often helpful in guiding discussions about new or controversial technologies. For example, a new bone marrow transplantation procedure may provide a chance for cure. The procedure, however, may entail long periods of pain and suffering. These discomforts should be considered in view of the suffering that the disease itself might cause and in view of the suffering that other treatments might cause. The commitment to provide least harmful interventions illustrates the term *nonmaleficence*. The standard of nonmaleficence promotes a continuing effort to consider the potential for harm even when it may be necessary to promote health.

Justice. **Justice** refers to fairness. The term is often used during discussions about resources: when competition for a scarce resource exists, justice mandates that decisions be fair and, to the greatest extent possible, unbiased. In decisions about which patient receives an available lung for transplantation, for example, it is understood that the lung will be allocated as fairly as possible. Understandings of fairness depend

on community values. In Canadian society, community standards dictate that the decision should not depend on who has the higher intellect or larger salary; instead, the decision must be based on need alone. Of course, the definition of need can be debated, and when two people have equal need, nothing in the theory helps health care providers decide between them. These are ethical questions that require further exploration of values, principles, and priorities to guide decisions in resource allocation.

The literature also mentions other prevalent forms of justice that you need to understand, such as **social justice**. Social justice is often related to a concern for the equitable distribution of benefits and burdens in society (Boutain, 2005), with the view that broad social change is necessary to address the determinants of health and reduce inequalities of health (World Health Organization, 2008). According to the "Ethical Endeavours" section of the CNA (2008) *Code of Ethics*, your moral obligations extend to recognizing "the need for change in systems and societal structures in order to create greater equity for all. You should endeavour as much as possible, individually and collectively, to advocate for and work toward eliminating social inequities . . ." (p. 16). This section of the *Code of Ethics* is somewhat visionary, inasmuch as its statements extend beyond just "what is" to "what ought to be" in nursing as a profession. It makes clear that if the status quo in health care is inefficacious, you must be an active participant in effecting change. This means you must recognize that part of your role is to work for change at the broader systems level, agitating for revisions to social policy, legislation, and institutional structures. This section of the *Code of Ethics* emphasizes the advocacy role for you and the need to work to bring about a system that is more focused on prevention, takes more account of the social determinants of health, is more accessible, and is more sustainable. Other scholars of bioethics, including Canadians Michael Yeo, Anne Moorhouse, Pamela Kahn, and Patricia Rodney (2010), who have written about nursing ethics, have incorporated a number of other principles such as fidelity (faithfulness), veracity (truth-telling), and confidentiality.

Feminist Ethics. Feminist ethicists consider their work a critique of conventional ethics, as well as a critique of social values. Their work focuses on continuing inequalities between people (Lindemann, 2006). A feminist ethics approach embodies features of being attentive to issues of difference; attentiveness to power dynamics; and being attentive to context and relatedness (Yeo et al., 2010). Feminist ethics is relevant for nurses in the deliberation of ethical issues as an expressive and collaborative process. Nurses hear the stories of patients and consider their social context in making ethical decisions.

Changes in attitudes toward women reflect new perspectives in women's relationship with family, with work, with science, and with society (Sherwin, 1992). For example, until the early 1980s, moral development was thought to reach the highest stages more often in men than in women. According to this thinking, moral development occurred in predictable stages. The most complex stage involved a sense of justice, and young girls did not reach this stage as often as did young boys (Kohlberg, 1981). Findings of research in the early 1980s disputed this conclusion. Gilligan (1982) proposed that Kohlberg's tools to measure moral development were gender biased. Gilligan went on to build a revised theory of moral development from her findings. She attempted to accommodate gender differences. Specifically, she concluded that young

girls tend to pay attention to community and to individual circumstances and that young boys tend to process dilemmas through ideals or principles determined abstractly.

Feminism proposes that gender makes a difference in the construction of roles and identities in society, and accordingly in how individuals and groups are treated. Feminist ethics holds the belief that society remains “patriarchal” in many ways (Yeo et al., 2010). Hilde Lindemann Nelson (2000), a noted feminist scholar in the United States, provided a history of the development of feminist ethics and bioethics. She noted that the feminist attention to gender and gender-related issues gave rise to an important perspective called **care theory**, which is about a type of virtue ethic that gives moral weight to caring for others (see Chapter 18). This was an important development in thinking about ethics because it moved attention away from the traditional masculine virtues toward those that had traditionally been considered more feminine.

Relational Ethics. It is becoming increasingly apparent that relationships are the basis of ethics in nursing. According to **relational ethics** theory, ethical understandings are formed in, and emerge from, a person’s relationships with others, whether those others are patients, families, communities, or colleagues (Bergum, 2004; Bergum & Dossetor, 2005; Hartrick Doane & Varcoe, 2007; Wright & Brajtman, 2011). According to Bergum (2004), relational ethics is a way of “being,” displayed in everyday interactions rather than a mode of decision making. It is how you insert a needle, how you enter into conversation, how you show respect, or how you behave with other people.

Relational ethics focuses on the role of relational context or the experience of the relationships in shaping moral choices (Bergum, 2004; Wright & Brajtman, 2011). In research on relational ethics, Bergum (2004) identified four themes: environment, embodiment, mutual respect, and engagement. **Environment** concerns critical elements or characteristics of the health care system within which you work and how the nature of your relationships is affected by this system. Bergum encouraged nurses to consider the entire health care arena as a network or matrix, in which each part is connected, either directly or indirectly, to the other. An awareness of this connectedness encourages you to look beyond the immediate situation and try to envision a broader context. It also makes you conscious of how power and politics affect your entire system of care (Oberle & Raffin Bouchal, 2009).

In relational ethics, **embodiment** means recognizing that the mind–body split is artificial and that healing for both patient and family cannot occur unless “scientific knowledge and human compassion are given equal weight [and it is recognized that] emotion and feeling are as important to human life as physical signs and symptoms” (Bergum, 2004, p. 492). Such recognition requires you to become truly aware of what other people may be experiencing. You must make this awareness a part of your own experience. The nurse–patient relationship requires that you value patients and treat them with respect. Within the nurse–patient relationship, you use nursing knowledge to enhance the patient’s health and well-being. You always consider the unique needs of the patient as an individual. Mutual respect is created, with attention to both your and the patient’s needs, wishes, expertise, and experience (Bergum & Dossetor, 2005). **Mutuality**, loosely defined as a relationship that benefits both you and the patient and harms neither, requires your and the patient’s willingness to participate in a relationship that embraces the

values and ideas of one another as a means of developing new understandings, rather than judging the other person’s values and ideas.

Engagement means connecting with another person in an open, trusting, and responsive manner. Bergum (2004) suggested that it is through this connection that you develop a meaningful understanding of the other person’s experience. Engagement takes skill and practice, inasmuch as it requires a commitment to keeping the relationship caring and respectful. Bergum asserted that engagement “does not ask for *selflessness* on the part of you, but for both you and the patient to be recognized as *whole beings*” (p. 498). Engagement requires that you connect with the patient but, at the same time, set boundaries in such a way that the relationship remains on a professional level. Knowing how much to engage with another person is one of the greatest challenges in nursing.

Ethical Analysis and Nursing

An **ethical dilemma** is a conflict between two sets of human values, both of which are judged to be “good” but neither of which can be fully served. Ethical dilemmas can cause distress and confusion for patients and caregivers. You may well be faced with ethical questions that have not been examined previously and for which no practical wisdom exists. You must be able to examine issues and apply experience and wisdom in each situation. The CNA (2008) *Code of Ethics* identified the responsibility of nurses to maintain their “fitness to practise” as having the “necessary physical, mental or emotional capacity to practise safely and competently” (p. 18). Such fitness requires you to be knowledgeable and skillful as you engage in problem solving. Ethical issues must be analyzed carefully and deliberately. Ethical analysis involves descriptive, conceptual, and normative processes. Analysis of situations begins with acquiring knowledge to gain a sense of what is going on (descriptive analysis), as well as finding out about relevant policies, laws, relationships, and stakeholders. Conceptual analysis is clarifying the meaning of the situation, values, and assumptions of all individuals involved. Normative analysis focuses on what ought to be done, based on the people involved and the values of the people (Yeo, et al., 2010).

Resolving an ethical dilemma requires deliberate, critical, and systematic thinking (Box 7-4). It also requires negotiation of differences (between beliefs, values, opinions, and so forth), incorporation of conflicting ideas, and an effort to respect differences of opinion. The process of negotiating ethical dilemmas may be in part the process of understanding ambiguities. You need to be knowledgeable and adept in making logical, fair, and consistent decisions. Ethical decision-making models offer a variety of methods for reaching informed conclusions (Box 7-5).

► BOX 7-4 How to Analyze an Ethical Dilemma

- Step 1:** Determine whether the issue is an ethical dilemma.
- Step 2:** Gather all the information relevant to the case.
- Step 3:** Examine and determine your own values on the issues.
- Step 4:** Verbalize the problem.
- Step 5:** Consider possible courses of action.
- Step 6:** Reflect on the outcome.
- Step 7:** Evaluate the action and the outcome.

► BOX 7-5 Two Ethical Decision-Making Frameworks

1. Information & Identification

- Concern
- People/population
- Ethical components

2. Clarification & Evaluation



3. Action & Review

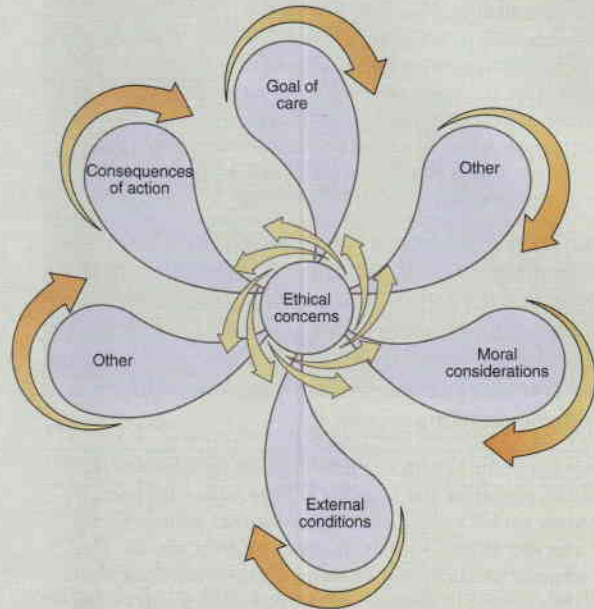


Diagram on left: From Storch, J. L. (2004). Model for ethical decision making for policy and practice. In J. Storch, P. Rodney, & R. Starzomski (Eds.), *Toward a moral horizon: Nursing ethics for leadership and practice* (p. 515). Toronto: Pearson Education. **Diagram on right:** From College and Association of Registered Nurses of Alberta. (2010). A model for questioning. In *Ethical decision-making for registered nurses in Alberta: Guidelines and recommendations* (p. 13). Edmonton: Author. Reprinted by permission of College and Association of Registered Nurses of Alberta.

Documentation of the ethical process can take a variety of forms. Whenever the process involves a family conference or results in a change in the plan of care, the process should be documented in the medical record. At some institutions, the ethics committee may use a formal consultation format whenever a request for discussion arises. If the ethical dilemma does not directly affect patient care, however, discussion may be documented by minutes from a meeting or in a memorandum to affected parties. In the following case study, the nursing concerns and the family conferences would be recorded in the medical record and in nursing flow sheets.

On your unit, a 35-year-old woman has been hospitalized in the final stages of brain cancer. She is a single mother with two young children. Although she has been treated by both conventional and experimental treatments, the tumour continues to grow, and the medical team has agreed that further treatment would be futile. You have cared for this patient during past hospital admissions, and during an especially open discussion, she expressed wishes to explore "do not resuscitate" (DNR) orders. During the current admission, her primary physician is out of town. The attending physician does not know the patient personally, but he has spent time with her. He has reviewed the clinical data and agrees that the patient is entering the terminal stage of the disease. In his opinion, however, the patient is not ready to discuss end-of-life issues. He states that the patient has declined to discuss DNR orders with him. You ask the physician to convene a family conference about the issues. He refuses, stating that he believes the patient is not ready to participate.

Step 1: Is this an ethical dilemma? What may at first appear to be a question of ethics may be resolved by clarifying your knowledge about clinical facts. A review of policy and procedure, or of standards of care, may reveal legal obligations that determine a course of action, regardless of personal opinion.

If the question remains perplexing, and the answer will be profoundly relevant to several areas of human concern, then an ethical dilemma may exist.

The single mother's situation meets the criteria for an ethical dilemma. Further review of scientific data will probably not contribute to a resolution of the dilemma, but it is important to review the data carefully to make this determination. The disagreement does not revolve around whether the patient is in a terminally ill state, so further clinical information will not change the basic question: Should the patient have an opportunity to discuss DNR orders at this time? The question is perplexing. Two professional team members disagree on an assessment of a patient's readiness to confront the difficult issues related to dying. The answer to the question "Is this patient ready to discuss end of life?" has important implications. If she is not ready, then raising the issue may cause anguish and fear in the patient and her family. If she is ready and the team avoids discussion, she may suffer unnecessarily in silence. If she is very close to death, then in the absence of a DNR order, necessitate cardiopulmonary resuscitation (CPR) will be performed in a futile situation. You know that CPR can cause pain. If applied in a situation in which the patient's life is unlikely to be extended or improved, CPR could prolong her suffering and reduce her dignity.

Step 2: Gather as much information as possible that is relevant to the case. Because resolution to dilemmas may arise from unlikely sources, incorporate as much knowledge as possible at every step of the process. At this point, the information could include laboratory and test results, the clinical state of the patient, and current literature about the diagnosis or condition of the patient. It may include investigation of the psychosocial concerns of the patient, as well as those of her significant others. The patient's religious, cultural, and family orientations are part of the nurse's assessment.

You obtain all the clinical information that is pertinent to the question. It may be helpful to determine whether the patient retains most cognitive functions, even though her tumour is aggressive. You review the chart and discuss this aspect with the physician, and you agree that the patient is fully competent but afraid and overwhelmed by the prognosis. Because two professionals disagree on a patient's state of mind, it may be helpful to reassess the patient or request that an independent person assess the patient's readiness to discuss end-of-life issues. Sometimes family members or significant others hold important clues to a patient's state of mind.

Step 3: Examine and determine your own values on the issues. This step is important for all participants in the discussion. At this stage, you and the other participants practise values clarification, and you differentiate between your own values and the values of the patient and of other health care team members. Essential parts of the goal are to form your own opinion and to respect others' opinions.

At this point, you stop to reflect on your own values. Your own religious practices may allow you to decide to forgo further treatment if you were in the patient's condition. You also may not yet have family members who rely on you, such as children or elderly parents. This patient's religious practices may be more strictly constructed than your own. Her religion discourages actions that diminish life in any way, and you realize that she may have come to see a DNR order as giving up, or as "acting like God." In addition, you understand that the attending physician has not had time to know this patient as her own physician has or as you have. You continue to believe that the patient would be capable of a discussion, despite her statements to the physician. In fact, you believe that she would benefit from a discussion, because perhaps the presence of an unfamiliar caretaker, combined with declining physical health, has silenced her, even though her fears and concerns persist.

Step 4: Verbalize the problem. Once all relevant information has been gathered, accurate definition of the problem may proceed. It is helpful to state the problem in a few sentences. By agreeing to a statement of the problem, the health care team, the patient, and the family can proceed with discussion in a focused way.

Here, the problem seems to be this: whether this patient should discuss DNR at this time. Determine the benefits and risks of a DNR order at this time. Other important questions relate to the patient's current state of mind: Is she afraid to speak? Is she feeling cut off from her normal network (a primary physician)? Are these feelings contributing to confusion about DNR decisions?

Step 5: Consider possible courses of action. What options are available within the context of the situation and the patient's values?

Once you have asked the basic question, other questions and possible courses of action arise. Should you initiate a discussion with the patient independently of the physician? Would you be outside your professional role if you facilitated a DNR order? What if your assessment were incorrect? Would you contribute not to the dignity but to the distress of the patient? The answers to these questions may be elusive, because they depend on an understanding of the patient's feelings and values that are not necessarily obvious. Even if the nurse cannot legally write a DNR order, the nurse can influence a physician's or patient's decision regarding DNR; therefore, troubling questions remain.

Step 6: Reflect on the outcome. This is the most important and delicate step of the process. These negotiations may happen informally at the patient's bedside or in the charting room, or

a formal ethics meeting may be necessary. Your point of view represents a unique contribution to the discussion.

In an ethics committee meeting, the discussion is usually multidisciplinary. A facilitator or chairperson ensures that all points of view are examined and that all pertinent issues are identified. A decision or recommendation is the usual outcome of discussion and the result of a successful discussion. In the best of circumstances, participants discover a course of action that meets criteria for acceptance by all. On occasion, however, participants may leave the discussion disappointed or even opposed to the decision.

The discussion focuses on the disagreement between your assessment and the physician's regarding the patient's readiness to discuss end-of-life issues. The principles involved during the discussion include beneficence and nonmaleficence: Which plan would provide the most good for this patient—a DNR order or no order? A separate question addresses the patient's point of view: Would a discussion with the patient promote well-being or promote anguish? Furthermore, according to the principle of autonomy, a troublesome question remains: Does the patient want something different from the desire she is expressing?

With several members of the health care team present, the discussion proceeds. You present your point of view. You continue to sense that the patient is ready to discuss DNR orders but that she may be reluctant to trust the circumstances of this admission. You respect the attending physician and his analysis and continue to be concerned that the patient may have experienced a change of mind between the last admission and this one. In the end, the team proposes a formal meeting with the patient, in which you, the attending physician, and a supportive family member are present. You support this proposal because you sense that it will maximize the support of the patient's existing network. In addition, you recognize that in a trusting environment, the patient is more likely to express fears, insecurities, and wishes. Team members agree to keep the discussion open-ended and exploratory. You suggest that rather than asking whether the patient wants a DNR order, the team could wait for her to bring up the issue. In this way, the team could be assured of her consent and willingness to participate in the discussion.

Step 7: Evaluate the action and the outcome.

At the meeting, the patient in fact opens up. She expresses relief at the chance to explore her options and feelings. Pain management issues are clarified. She wants to discuss a DNR order but requests a visit from her priest before she must make a final decision.

Ethical Issues in Nursing Practice

With increased professional responsibility and accountability, and with changes in the workplace and health care system, you are increasingly facing a myriad of ethical issues. You face ethical issues daily while caring for patients and families, while relating to other health care providers, institutions, and global societal issues. The following section explores current issues in which ethical issues arise.

Patient Care Issues

Informed Consent. The intimacy and integrity of the nurse-patient relationship mandate that you protect the rights of your patients. You achieve this mandate as you follow standards, policies, guidelines, and legislation regarding consent

to treatment. **Informed consent** is consent to treatment on the basis of accurate and complete information (see Chapter 8). The goal of informed consent is to protect the patient's right to autonomy. The CNA (2008) *Code of Ethics* (p. 11) asserts that to promote and respect informed decision making, some of the nurse's ethical responsibilities are as follows:

- Building trusting relationships to ensure that the patient's choice is understood, expressed, and advocated
- Providing the desired information and support so that patients can make informed decisions
- Assisting patients in obtaining the most accurate current knowledge about their health condition
- Being sensitive to the inherent power differentials between health care providers and patients: nurses must not misuse power to influence decision making
- Recognizing that the patient has the right to refuse or withdraw consent
- Respecting the informed choices of capable persons, including choice of lifestyles or of treatment not conducive to good health

Many unethical scenarios can involve consent: a patient's signing consent forms without understanding what treatment entails; a nurse's mistaken assumption that a physician has explained a medical procedure to a patient before obtaining the patient's consent; obtaining consent from a patient who does not speak the health care team's language without the assistance of an interpreter; or a patient's consenting to a procedure without knowing about associated risks or potential adverse side effects.

Although obtaining informed consent for medical procedures is not a nursing duty, you may witness the patient's signature on the consent form. When you provide consent forms for patients to sign, your main responsibility lies with ensuring that the patient fully understands the nature of the treatment or procedure. If not, notification of the physician must occur so that the physician can clarify or provide additional information.

Futile Care. In the early 1980s, issues such as enhanced life-sustaining technologies, patients' rights movements, and growing concerns about using health care resources in a cost-effective and efficient manner led to academic discussions, debates, and practice policies on medical futility. **Medical futility** is defined as a medical treatment that is considered impossible or unlikely to achieve its therapeutic goal, or suggests that there is something problematic about the goal (Browne, 2000). Patients often worry, in the event of their becoming incapacitated and unable to express their wishes, that they will be "hooked up to machines" and receive treatment that they do not desire (Figure 7-1). At issue is whether clinicians are sufficiently objective to establish that a given intervention is futile as determinations of futility are often laden with biases.

Although health care providers are best equipped to determine the physical benefits of treatment, only the patient or people who know the patient best can determine whether treatment is advancing the patient's overall wellbeing. Bennett Jacobs and Taylor (2005a) identified this issue as "qualitative" futility or subjective determination, in which not just medical facts but also values lead the patient or the patient's surrogate decision makers to conclude that the treatment has no benefit according to those values (Ulrich et al., 2010).

Achieving holistic outcomes of care must be based on an interplay of physical facts and subjective values. Taylor (1995)



Figure 7-1 Nurses often struggle when patients are receiving care that they believe is prolonging their suffering and their life.

suggested the following four classifications of futility: (1) not futile: beneficial to both physical and overall well-being; (2) futile: nonbeneficial to either physical or overall well-being; (3) futile from the patient's perspective: medically indicated but not valued by the patient; and (4) futile from the clinicians' perspective and not medically indicated but valued by the patient (p. 301). It is evident that these classifications have objective and subjective dimensions, as well as quantitative and qualitative dimensions, and constitute a more complete way of viewing the complex notion of futility.

The issue of who has priority in health care decision making remains complex and often troublesome. The potential for futility conflicts is high in situations of critically and chronically ill patients. What, then, is your role? Taylor (1995) suggested that nurses play a leading role in working toward pursuing negotiated compromise between health care providers and patients equally, for the best possible outcome for the particular patient. She suggested that this may be accomplished "by identifying patients, families, and health care teams at risk of experiencing conflict about futile care, and then initiating dialogue that may prevent or resolve conflict" (p. 303). Rather than subscribing to categories of levels of futility to drive decision making, many health care agencies have now developed end-of-life guidelines that are tailored to patients' needs. These guidelines include a determination of levels of intervention or goals of care that range from fully acute to palliative/comfort care (Rocker & Dunbar, 2000). Levels of intervention are based on the premise that specific interventions may either be withheld or administered based on individual patient needs, and that supportive/palliative care ought to be integrated with all levels. **Advance directives** are one way to address this problem (see Chapter 8). They are people's preferences, wishes, and likely plans in the event that they become incapable of expressing those wishes for themselves. Advance directives are commonly expressed in two ways: (1) an instruction directive, or living will, that identifies what life-sustaining treatment a patient desires in certain situations, and (2) a proxy decision maker who knows the person well and speaks for his or her best interests. Advance directives have the potential to facilitate communication about the withholding or withdrawing of treatment, even though these

directives are not codified in law in every Canadian province (Blondeau et al., 2000). A routine part of any admission to a hospital now usually includes inquiry about the patient's advance directives; if they exist, they are included as part of the medical record. It has become necessary for nurses to be aware of the legal status of all types of advance directives in their province or territory.

You have several roles regarding advance directives. You may be involved in helping patients plan an advance directive by discussing its uses and helping patients to clarify their values and wishes for end-of-life treatment. Your role also includes following the advance directive, alerting other health care providers to changes in the patient's wishes, and advocating on behalf of the patient or substitute decision maker if the patient's wishes or advance directive are not being followed.

Withdrawal of Food and Hydration. Maintaining nutrition is a natural life-sustaining measure and common part of the nursing role. A change in the patient's ability to drink and eat raises many issues. When food and hydration are administered for a prolonged period to a patient whose condition is not expected to improve, some nurses may view this care as extraordinary or heroic, whereas others see this as humane.

Current literature suggests that fluids should not be routinely administered to dying individuals or automatically withheld from them; rather, they should be given on the basis of the goals of care and a careful assessment of the patient's comfort. A position statement by the CNA (2001) on utility stresses the importance of the health care team to determine whether food and fluid are most beneficial or harmful to a patient. The following questions may aid health care providers in reflecting on the goals of care: Will the patient's well-being be enhanced by the administration of nutrition? Does the patient have symptoms that could be relieved or aggravated by the administration of nutrition? Could hydration enhance the patient's mental status or level of consciousness? Will it prolong the patient's life? Is that the wish of the patient and family (Bennett Jacobs & Taylor, 2005b; Ganzini, 2006)?

The administration of hydration may raise dilemmas when its use is intended merely to maintain physical life (e.g., when the patient is in a vegetative state or is near death). You should know that during the natural dying process, the body starts to "shut down," and the patient may lose the desire for food and fluids. Force-feeding a dying patient may sometimes do more harm than good. Withholding or withdrawing nutrition or hydration from a patient is no different from the decision to forgo any other medical treatment that may prolong the dying process. It is considered appropriate to withhold or discontinue life-sustaining medical interventions if they are not benefiting the patient or are contrary to the patient's wishes. Furthermore, it is important to stress to families that dying individuals who are not receiving artificial nutrition or hydration will still be provided with adequate overall care.

Issues of Safety in the Work Environment

Nurses are responsible for providing safe, compassionate, competent, and ethical care (CNA, 2008). In ensuring safety, care must be such that harm is minimized. Lack of control over important aspects of the environment can lead to ethically ambiguous situations (Austin, 2007). Complex life-and-death events, multiple role responsibilities, loyalties and expectations, reduced numbers of skilled health care providers, minimal clinical nursing leadership, interdisciplinary team

conflict, and autocratic organizational decision making may create personal moral conflict for you (Austin, 2007; Canadian Health Services Research Foundation, 2006).

Causing harm to patients in the form of pain and suffering from continuing treatment is a source of **moral distress** for nurses that they often believe could be avoided. "Moral distress arises in situations where nurses know or believe they know the right thing to do, but for various reasons (including fear or circumstances beyond their control), do not or cannot take the right action to prevent a particular harm" (CNA, 2008, p. 6). Sometimes nurses find it hard to care for a patient when other health care providers, usually physicians, make choices that nurses think are causing more harm than good. For example, the situation of a patient in intensive care who is comatose but seems to experience great pain when turned over can be very upsetting for nurses. They may experience moral distress if they feel that they are, in effect, torturing the patient each time they turn him or her over. Keeping patients safe from harm can be difficult, and sometimes it requires great ethical sensitivity to be aware of harms that are being caused. In these situations, nurses may lose their sense of **moral integrity** or "wholeness" when they are committed to certain values and beliefs that are not upheld because of situational constraints. If these situations continue and integrity is compromised, nurses may experience **moral residue**, when they seriously compromise themselves or allow themselves to be compromised (CNA, 2008, p. 7). Relational ethics helps you know what the patient considers harm, and it is crucial to engage in discussions with your patients and colleagues.

Other kinds of harm can come to patients because of inadequate or inappropriate caregiving. Sometimes harm results from mistakes that can be explained; sometimes it results from carelessness or incompetence. For example, when you have a lot of very ill patients to care for and you have many demands on your time, medication errors can occur because you are distracted and feeling rushed. These kinds of errors are unfortunate, but they are not breaches of ethics as such. On the other hand, if you make a medication error because you have been out partying all night before your shift and you were not fit to practise that day, the error would be considered unethical. Either way, you need to monitor your own competence to practise, and you must admit to your mistakes. Regardless of the cause, if you make a mistake, not admitting it is considered unethical.

In a multidisciplinary environment, all health care providers must take responsibility for the care that is provided (Boxes 7-6 and 7-7). You need to be aware of what other providers are doing for and with their patients. If **adverse events** occur—that is, "unexpected, undesirable incidents resulting in injury or death that are directly associated with the process of providing health care or services to a person receiving care" (CNA 2008, p. 18)—then you must report them, regardless of who is responsible. The person who is most directly involved when an adverse event occurs should be the one to report it, but sometimes that does not happen. In that situation, if you observe the event, you must report it. It is your obligation to ensure patient safety, but it is not easy because it can mean exposing the incompetence of a colleague. Imagine, for example, that you observe another nurse drop a frail elderly patient during transfer. The patient does not seem hurt, and the other nurse does not seem to plan to report the incident. Should you report it yourself? Your obligation is to speak to the other nurse and ensure that the incident is reported. If the

* BOX 7-6 RESEARCH HIGHLIGHT

Ethics in Nursing Practice

Research Focus

Gaudine et al. (2011) were interested in exploring ethical conflict of nurse and physician participants from four university teaching hospitals, located in Atlantic Canada and central Canada, about their ethical conflicts in clinical situations and with the organization, and their perceptions of barriers to consulting the clinical ethics committees in their hospitals.



Research Abstract

Much of the literature on clinical ethical conflict has been specific to a specialty area or a particular patient group, as well as to a single profession. This Canadian study identified themes of hospital nurses' and physicians' clinical ethical conflicts that cut across the spectrum of clinical specialty areas, and compared the themes identified by nurses with those identified by physicians. The authors interviewed 34 clinical nurses, 10 nurse managers, and 31 physicians working at four different Canadian hospitals as part of a larger study on clinical ethics committees and nurses' and physicians' use of these committees. They described nine themes of clinical ethical conflict that were common to both hospital nurses and physicians, and three themes that were specific to physicians. Finally the authors suggested reasons for differences in nurses' and physicians' ethical conflicts and discussed implications for practice and research.

Evidence-Informed Practice

A few common themes of ethical conflict are these:

- Disagreement about care decisions or treatment options
- Others not respecting a patient's wishes
- Patient not receiving quality end-of-life care

"Striving to do what is best for the patient" underpins all the clinical ethical conflict. Overall, there are more similarities than differences in the clinical ethical conflicts experienced by nurses and physicians.

Many clinical situations described by the participants included more than one theme of ethical conflict. This suggests the complexity and interrelatedness of ethical concerns experienced in the day-to-day provision of care. One clinical situation can present a myriad of ethical concerns.

Both the nurses and the physicians gave examples of "disagreement about care decisions or treatment options." This may be surprising, because physicians typically make the decisions. However, there are many levels of physician care (clinical associate, clerk, consulting physicians) wherein physicians may not be in charge of the patient's care and thus may not agree with treatment decisions.

Nurses reported conflict not only with physicians but also with other health care providers. This may reflect the evolving nature of interprofessional teams and the complexities of collaboration across health disciplines.

Reference: Gaudine, A., Lefort, S., Lamb, M., & Thorne, L. (2011). Clinical ethics conflict of nurses and physicians. *Nursing Ethics*, 18(1), 9–19.

nurse does not report it, then you must do so, inasmuch as this is a clear issue of patient safety, and your obligations are clear. **Whistle blowing** (i.e., reporting a colleague's errors, incompetence, unsafe or negligent practice, or abuse of patients) is one of the most difficult actions you must take in ensuring that safe, compassionate, competent, and ethical care is met (Oberle & Raffin Bouchal, 2009).

* BOX 7-7 FOCUS ON PRIMARY HEALTH CARE

How to Encourage Nurses Individually and Collectively to Work Toward Eliminating Social Inequities



- Utilize the principles of primary health care for the benefit of the public and patients receiving care.
- Understand that some groups in society are systemically disadvantaged, which leads to poorer health and diminished well-being. Nurses work to improve the quality of lives of people who are part of disadvantaged and vulnerable groups and communities, and they take action to overcome barriers to health care.
- Recognize and work to address organizational, social, economic, and political factors that influence health and well-being within the context of your role in the delivery of care.

* KEY CONCEPTS

- Values clarification helps nurses explore personal values and feelings and to decide how to act on personal beliefs. It also facilitates nurse-patient communication.
- Ethics is the study of philosophical ideals of what is beneficial or valuable for all.
- A code of ethics provides a foundation for professional nursing. Such a code promotes accountability, responsibility, and advocacy.
- Theories of bioethics refer to ethical issues specific to the delivery of health care. They are based on the principles of autonomy, beneficence, nonmaleficence, and justice.
- Relational ethics theory encompasses more than bioethics: it addresses the role of relationship in the ethical delivery of health care. It maintains that the nurse-patient relationship is the foundation of nursing ethics.
- Ethical problems arise from differences in values, from technological advances, from end-of-life experiences, and from changes in work environments.
- A standard process for thinking through ethical dilemmas, including critical thinking skills, helps health care providers resolve conflict or uncertainty about correct actions.

* CRITICAL THINKING EXERCISES

1. Complete the values clarification exercise (Box 7-1) with your classmates or others. Compare the answers and discuss the differences.
2. You are a clinic nurse in a small community clinic. A 17-year-old female patient has been coming to the clinic for treatment for and support with a sexually transmitted infection. During recent months, she has lost her support from a close friend. In addition, her parents are divorced, and she has little contact with them. Her health and well-being are of concern. Her appearance is unkempt, her nutritional status is not balanced, and she has admitted to being depressed. She asks for your help in planning her suicide. Discuss your response to her request. Begin by acknowledging the laws related to assisted suicide in Canada. Examine your personal feelings about suicide. Include a discussion about your understanding of sexually transmitted infections: Where do they come from? Who gets these infections? Why do people get

these infections? What are your feelings and opinions about people with sexually transmitted infections? Construct your response, keeping in mind the theory of relational ethics. Discuss your role in this situation. What are your possible courses of action?

3. You have been assigned the care of a 98-year-old woman who was recently admitted with a diagnosis of pneumonia. She has a history of cardiac disease and takes a number of medications. She had been fairly active until the past few days, when her cough worsened and a fever developed. You note that her pulse has become weak and threadlike and that her respirations are increasingly laboured. The patient is now too weak to respond to you. When you mention to the family that you may need to call the physician and even take heroic life-saving measures, the patient's son and daughter become distraught, saying that they do not want their mother to be kept alive on "machines." They report that they have discussed this situation with their mother. You find that her wishes have not been documented in her chart. The family members have not discussed this situation with the patient's primary physician. What actions would you consider taking at this moment? Take into account the ethical principles of autonomy and beneficence and the idea of futile care. What are your personal values about interventions at the end of life?

✦ REVIEW QUESTIONS

1. Values clarification plays a major role in
 1. Creating a set of rules for conduct
 2. Identifying values that should be accepted by all
 3. Resolving issues of "value conflict"
 4. Developing a code of ethics
2. In Canada, equitable access to health care means that all citizens have equal access to medically necessary services. Many jurisdictions have implemented private magnetic resonance imaging clinics. A discussion about the ethics of this situation would involve predominately the principle of
 1. Accountability
 2. Autonomy
 3. Relational ethics
 4. Justice
3. It may seem redundant when health care providers, including professional nurses, agree to "do no harm" to their patients. The point of this agreement is to reassure the public that in all ways, not only will the health care team work to heal patients but they also agree to do this in the least painful and harmful way possible. The principle that describes this agreement is called
 1. Beneficence
 2. Accountability
 3. Nonmaleficence
 4. Respect for autonomy
4. Vaccination may cause temporary discomfort, but the benefits of protection from disease, both for the individual and for society, outweigh the patient's discomfort. This involves the principle of
 1. Beneficence
 2. Fidelity
 3. Nonmaleficence
 4. Respect for autonomy
5. If a nurse assesses a patient for pain and then offers a plan to manage the pain, the principle that encourages the nurse to monitor the patient's response to the plan is
 1. Beneficence
 2. Justice
 3. Nonmaleficence
 4. Respect for autonomy
6. Including patients in decision making regarding their care and respecting their choices of treatment demonstrate the principle of
 1. Beneficence
 2. Autonomy
 3. Justice
 4. Veracity
7. Nurses agree to be advocates for their patients. Practice of advocacy calls for the nurse to
 1. Seek out a nursing supervisor in situations involving conflict
 2. Work to understand the law as it applies to the patient's clinical condition
 3. Assess the patient's point of view and prepare to articulate this point of view
 4. Document all clinical changes in the medical record in a timely manner
8. Which of the following is *not* part of the nurse's role as patient advocate?
 1. Intervening if other people fail to respect the patient's dignity
 2. Protecting the patient's right to confidentiality and privacy
 3. Making nursing care decisions for the patient
 4. Advocating for appropriate use of interventions to minimize suffering
9. The philosophy of relational ethics suggests that ethical dilemmas can best be solved by attention to
 1. Relationships
 2. Ethical principles
 3. Patients
 4. Code of ethics for nurses
10. Ethical dilemmas often arise over a conflict of opinion. Once the nurse has determined that the dilemma is ethical, a critical first step in negotiating the difference of opinion is to
 1. Consult a professional ethicist to ensure that the steps of the process occur in full
 2. Gather all relevant information regarding the dilemma
 3. List the ethical principles that inform the dilemma so that negotiations agree on the language of the discussion
 4. Ensure that the attending physician has written an order for an ethics consultation to support the ethics process

✦ RECOMMENDED WEB SITES

Canadian Bioethics Society: <http://www.bioethics.ca>

Founded in 1988 through the amalgamation of the Canadian Society of Bioethics and the Canadian Society for Medical Bioethics. Members include health care administrators, lawyers, nurses, philosophers, physicians, theologians, and other professionals concerned with the ethical and humane

dimensions of health care. The Web site offers information about the annual CBS conference, national and international ethics organization links, and relevant ethics journals from a variety of disciplines.

Canadian Nurses Association—Code of Ethics: http://www2.cna-aiic.ca/CNA/practice/ethics/code/default_e.aspx

Provides a link to the CNA and the *Code of Ethics for Registered Nurses* (CNA, 2008).

W. Maurice Young Centre for Applied Ethics: <http://www.ethics.ubc.ca>

Established by the University of British Columbia in 1993; primarily an interdisciplinary research centre in which a variety of ethics topics are studied. The Web site has links to other ethics organizations and ethics resources. The centre's newsletter is also available on the Web site.

Nursing Ethics.ca: <http://www.nursingethics.ca/>

The page has links to Canadian resources that support ethical nursing practice.

Provincial Health Ethics Network of Alberta (PHEN): <http://www.phen.ab.ca/>

Established as a society in 1995; provides information for all Albertans about ethics and access to health ethics resources. Its mission is to facilitate examination, discussion, and decision making with regard to ethical issues in health and health care.

Review Question Answers

1. 3; 2. 4; 3. 3; 4. 1; 5. 4; 6. 2; 7. 3; 8. 3; 9. 1; 10. 2

Rationales for the Review Questions appear at the end of the book.

Legal Implications in Nursing Practice

Written by Carla Shapiro, RN, MN

Based on the original chapter by Christine R. Durbin, RN, PhD, JD

objectives

Mastery of content in this chapter will enable you to:

- Define the key terms listed.
- Explain legal concepts that apply to nurses.
- Describe the legal responsibilities and obligations of nurses.
- List sources for standards of care for nurses.
- Define legal aspects of nurse–patient, nurse–physician, nurse–nurse, and nurse–employer relationships.
- List the elements needed to prove negligence.
- Give examples of legal issues that arise in nursing practice.

key terms

- | | |
|-----------------------------------|------------------------------|
| Advance directive, p. 104 | Intentional torts, p. 97 |
| Adverse occurrence report, p. 105 | Living will, p. 104 |
| Assault, p. 97 | Negligence, p. 98 |
| Battery, p. 97 | Nursing practice acts, p. 96 |
| Civil law, p. 95 | Risk management, p. 105 |
| Common law, p. 95 | Standards of care, p. 95 |
| Euthanasia, p. 103 | Statute law, p. 95 |
| Incident report, p. 105 | Tort, p. 97 |
| Informed consent, p. 100 | |

media resources

evolve WEBSITE

<http://evolve.elsevier.com/Canada/Potter/fundamentals/>

- Audio Chapter Summaries
- Examination Review Questions
- Glossary
- Student Learning Activities
- Weblinks

Safe nursing practice includes knowledge of the legal boundaries within which nurses must function. Nurses must understand the law to protect themselves from liability and to protect their patients' rights. Nurses need not fear the law; rather, they should view it as representing what society expects from them. Laws are continually changing to meet the needs of the people they are intended to protect. As technology has expanded the role of the nurse, the ethical dilemmas associated with patient care have increased and often become legal issues as well. As health care evolves, so do the legal implications for health care. Although federal laws apply to all provinces and territories, nurses must also be aware that laws do vary across the country. It is important for nurses to know the laws in their province or territory that affect their practice. Being familiar with the law enhances nurses' ability to be patient advocates.

Legal Limits of Nursing

Nurses have a fiduciary relationship with their patients. A fiduciary relationship is one in which a professional (the nurse) provides services that, by their nature, cause

the recipient (the patient) to trust in the specialized knowledge and integrity of the professional. In the fiduciary relationship, nurses are obligated to provide knowledgeable, competent, and safe care.

Although legal actions against nurses were once rare, the situation is changing. The public is better informed now than in the past about their rights to health care and are more likely to seek damages for professional negligence. The courts have upheld the concept that nurses must provide a reasonable standard of care. Thus, it is essential that nurses understand the legal limits influencing their daily practice.

Sources of Law

The Canadian legal system can be divided into two main categories: public law and private law. Public law is chiefly concerned with relations between individuals and the state or society in general and includes constitutional, tax, administrative, human rights, and criminal law. Private law involves disputes between individuals and covers issues such as wills, contracts, marriage and divorce, and civil wrongs (e.g., negligence). Whereas public law is addressed in the same manner across the country, two systems deal with private law issues—**civil law** (based on Roman law) in Quebec and **common law** (based on British common law) throughout the rest of the country. These two systems differ primarily in their legal processes. In each system, courts interpret the rules made by the legislature in the context of specific disputes.

When either a civil or a criminal case goes to court, decisions are based on previous case rulings. How courts rule on the circumstances and facts surrounding the case is called a *precedent*. If a case is decided on the basis of certain facts, the court is bound to follow that decision in subsequent similar cases. Not every jurisdiction has case law on a given issue. For example, cases regarding a patient's right to refuse treatment are not found in every province. In such situations, other jurisdictions are consulted for guidance. In general, breaches of private law result in the payment of money to compensate the aggrieved party for damages incurred. Violations of public law may result in a range of remedies, including fines or imprisonment.

Statute law is created by elective legislative bodies such as Parliament and provincial or territorial legislatures. Federal statutes apply throughout the country, and provincial and territorial statutes apply only in the province or territory in which they were created. Examples of provincial statutes are the *Regulated Health Professions Act* (1991) in Ontario and nursing practice acts throughout the country, which describe and define nursing practice within each province.

Examples of federal statutes are the new *Assisted Human Reproduction Act* (2004), the *Controlled Drugs and Substances Act* (1996), and the *Food and Drugs Act* (1985).

Professional Regulation

Like all self-governing professions in Canada, nursing is regulated at the provincial or territorial level. Each province and territory has legislation that grants authority to a nursing regulatory body. These regulatory bodies are accountable to the public for ensuring safe, competent, and ethical nursing care. Regulatory bodies are responsible for granting certificates of registration, offering practice support, ensuring continuing competence of its members, investigating complaints against members' conduct, and disciplining members when necessary. Regulatory bodies are also responsible for developing codes of

ethics, setting standards of practice, and approving nursing education programs (McIntyre, & McDonald, 2010).

Separate regulatory bodies exist for registered nurses and practical nurses. Some provinces also have regulatory bodies for registered psychiatric nurses. These regulatory bodies are called either the *provincial association* or the *college of nursing* (e.g., the Alberta Association of Registered Nurses, the College of Licensed Practical Nurses of Alberta, the College of Nurses of Ontario). The trend appears to be a move to the college model, with a stronger focus on regulation of practice and accountability to the public.

Nurses must be registered by the professional nursing association or college of the province or territory in which they practise. The requirements for registration (or licensure, as applicable) vary across the country, but most provinces and territories have minimum education requirements and require the nurse to pass an examination. All provinces and territories (except Quebec) use the Canadian Registered Nurse Examination. Quebec has created its own examination. Registration (or licensure) enables people to practise nursing and use the applicable nursing title and initials: registered nurse (RN) or registered practical nurse (RPN). All nurses' credentials must be verified, either by the listing of their names on a register or by their holding a valid licence to practise.

Registration can be suspended or revoked by the regulatory body if a nurse's conduct violates provisions in the registration statute. For example, nurses who perform illegal acts, such as selling controlled substances, jeopardize their registration status. Due process must be followed before registration can be suspended or revoked. *Due process* means that nurses must be notified of the charges brought against them and have an opportunity to defend themselves against the charges in a hearing. Such hearings do not occur in courts but are usually conducted by the regulatory body. If a nurse loses his or her professional licence, or if the nurse's name is removed from the provincial or territorial register, and if the case involves civil or criminal wrongs, then further legal consequences may follow.

Regulation of Nurse Practitioners

Over the past number of years, the role, responsibilities and use of nurse practitioners (NPs) has evolved in Canada. The utilization and regulation of NPs varies from jurisdiction to jurisdiction across the country. In some provinces or territories (e.g., Newfoundland, Northwest Territories, Nunavut), the title "nurse practitioner" is protected, and in others (e.g., Manitoba) these nurses are identified in other ways such as RN/EP (Extended Practice) or RN/NP (nurse practitioner). It is important that nurses communicate their regulated title to their patients, families, and other members of the health care team. The differences in regulatory approaches among jurisdictions can be confusing to consumers and can affect the mobility of nurses across the country as a result of this (McIntyre & McDonald, 2010).

Standards of Care

Standards of care are legal guidelines for nursing practice. Standards establish an expectation of nurses to provide safe and appropriate patient care. If nurses do not perform duties within accepted standards of care, they may place themselves in jeopardy of legal action and, more important, place their patients at risk for harm and injury. Nursing standards of care arise from a variety of sources, including statutes and laws of

broad application, such as the statutes and common law relating to human rights, privacy, and negligence; provincial statutes that specifically apply to health care professionals or nurses only; and the detailed regulations, practice standards, and codes of ethics that are generated by the professional associations. Nursing standards are also outlined in the written policies and procedures of employing institutions.

All provincial and territorial legislatures have passed health professions, **nursing practice acts**, or both that define the scope of nursing practice. These acts set educational requirements for nurses, distinguish between nursing and medical practice, and generally define nursing practice. The rules and regulations enacted by the provincial or territorial regulatory body help define the practice of nursing more specifically. For example, a nursing association may develop a rule regarding intravenous therapy. All nurses are responsible for knowing the provisions of the nursing practice act for the province or territory in which they work, as well as the rules and regulations enacted by the regulatory administrative bodies of their province or territory.

Professional organizations are another source for defining standards of care. The Canadian Nurses Association (CNA) has developed standards for nursing practice, policy statements, and similar resolutions. The standards delineate the scope, function, and role of the nurse in practice. Nursing specialty organizations also have standards of practice defined for certification of nurses who work in specific specialty areas, such as the operating room or the critical care unit. The same standards also serve as practice guidelines for defining safe and appropriate nursing care in specialty areas.

The Canadian Council on Health Services Accreditation requires that accredited health care institutions have nursing policies and procedures in writing that detail how nurses are to perform their duties. These internal standards of care are usually quite specific and are found in procedural manuals on most nursing units. For example, a procedure or policy that outlines the steps that should be taken when a dressing is changed or medication is administered gives specific information about how nurses are to perform these tasks. Nurses must know the policies and procedures of their employing institution because they all must follow the same standard of care. Institutional policies and procedures must conform to laws and cannot conflict with legal guidelines that define acceptable standards of care.

In a negligence lawsuit, these standards are used to determine whether the nurse has acted as any reasonably prudent nurse in a similar setting with the same credentials would act. A nursing expert is called to testify about the standards of nursing care as applied to the facts of the case (Box 8-1). The expert may be called to define and explain to the court what a reasonably prudent nurse would have been expected to do in view of the facts of the case in any similar setting around the country. It is recognized and understood that nursing practice differs according to the rural or urban nature of the institutional setting. In addition, home health care, occupational health nursing, and other community-based clinical settings require that the expert be familiar with the standards of care in these settings, as opposed to the traditional hospital or institutional setting. The expert must have the appropriate credentials, the appropriate experience, and an understanding of what the standard of care should have been in the specific case. The expert witness is distinguished from the fact witness. Staff nurses may testify in a court proceeding as fact witnesses if they have first-hand personal experience with the facts of the

► BOX 8-1

Anatomy of a Lawsuit

Pleadings: Statements of Claim and Defence

- The plaintiff outlines what the defendant or defendants did wrong and how that action caused injury.
- The statement of claim is then issued by the court and served on the defendant or defendants.
- Statements of claim are often very broad and may be served on the employer, institution, and all members of the health care team involved in the patient's care at the relevant time.
- The defendant or defendants must deliver a statement of defence to the allegations. The defendant or defendants can admit or deny each allegation in the petition.

Procedures of Discovery

Pretrial proceedings enable each side to gather legally relevant information from the other side and usually lead to a settlement between the parties before a trial.

1. *Examination for discovery:* The plaintiff's lawyer is permitted to question each defendant under oath. Examination for discovery usually takes place in private offices, with only the plaintiffs and defendants, their lawyers, and a reporter present to record a transcript of the testimony. Questioning can be wide-ranging and detailed in order to reveal useful information. Answers given to questions will be available for trial.
2. *Discovery of documents:* Each side can be forced to produce all documents relevant to the litigation. Medical records and nurses' notes may be of particular value.
3. *Independent medical examination of the plaintiff:* This examination is conducted to determine the extent of the plaintiff's injuries. Negligence cannot be charged without proof of damage.
4. *Discovery by interrogatories:* Similar to the examination for discovery, interrogatories involve a series of written questions, which must be answered under oath.

Expert Witnesses

An expert witness is an individual who, because of education, experience, or both, has knowledge that can assist decision makers in establishing whether the nursing care that was provided met the expected standard of practice. Each side usually selects experts to help explain and interpret the evidence as it emerges.

Pretrial Conference

The purpose of the pretrial conference is to identify points of contention, narrow down the issues, and encourage settlement out of court. In some jurisdictions, the pretrial conference may be mandatory. A pretrial conference is presided over by a judge and attended by counsel for the various parties. Most settlements take place without any admission of liability.

Trial

A trial usually occurs several years after the initial statement of claim is filed. Most nursing negligence cases are heard and decided by a judge alone. Damages are usually assessed at trial.

case. The expert witness evaluates the defendant's professional judgements and behaviour under the circumstances being reviewed.

General duty nurses are often legally responsible for meeting the same standards as other general duty nurses in similar settings. However, specialized nurses, such as nurses in a critical care unit or nurses who perform dialysis, are held to standards of care and skill that apply to all professionals in the same specialty. All nurses must know the standards of care that they are expected to meet within their specific specialty

and work setting. Ignorance of the law or of standards of care is not a defence against negligence, nor is being asked by an employer to perform an out-of-scope procedure. The law as written overrules any agency policy or procedure.

Legal Liability Issues in Nursing Practice

Torts

A **tort** is a civil wrong committed against a person or property. Torts may be classified as intentional or unintentional. **Intentional torts** are willful acts that violate another person's rights (Keatings & Smith, 2010). Examples are assault, battery, invasion of privacy, and false imprisonment. Negligence is an example of an unintentional tort.

Intentional Torts

Assault. Assault is conduct (such as a physical or verbal threat) that creates in another person apprehension or fear of imminent harmful or offensive contact. No actual contact is necessary in order for damages for assault to be awarded (Fridman, 2003; Osborne, 2003). Threats by a nurse to give a patient an injection or to restrain a patient for an X-ray procedure when the patient has refused consent constitute assault. The key issues are whether the patient was afraid of being harmed in the situation and whether the patient consented to a procedure. In a lawsuit wherein assault is alleged, the patient's consent would negate the claim of assault against a nurse.

Battery. Battery is any intentional physical contact with a person without that person's consent. The contact can be harmful to the patient and cause an injury, or it can be merely offensive to the patient's personal dignity (Sneiderman et al., 2003). In the example of a nurse's threats to give a patient an injection without the patient's consent, if the nurse actually gives the injection, it is considered battery. Battery could even be life-saving, as in the Ontario case of *Malette v. Shulman* (1990). In that case, the plaintiff was unconscious and bleeding profusely. The physician determined that she needed a life-saving blood transfusion. Before the transfusion, a nurse found a signed card in the plaintiff's purse that identified the patient as a Jehovah's Witness and stated that under no circumstances was she to receive blood. Despite this, the physician chose to administer the blood to preserve the patient's life. The plaintiff survived, recovered from her injuries, and successfully sued the physician for battery (Sneiderman et al., 2003).

In some situations, consent is implied. For example, if a patient gets into a wheelchair or transfers to a stretcher of his or her own volition after being advised that it is time to be taken for an X-ray procedure, the patient has given implied consent to the procedure. A patient has the right to revoke or withdraw consent at any time.

Invasion of Privacy. The tort of invasion of privacy protects the patient's right to be free from unwanted intrusion into his or her private affairs. Patients are entitled to confidential health care. Nursing standards for what constitutes confidential information are based on professional ethics and the common law. The ideals of privacy and sensitivity to the needs and rights of patients who may not choose to have nurses intrude on their lives but who depend on nurses for their care guide the nurse's judgement. The nurse's fiduciary duty requires that confidential information not be shared with anyone else except on a need-to-know basis.

One form of invasion of privacy is the release of a patient's medical information to an unauthorized person, such as a member of the press or the patient's employer. The

information that is contained in a patient's medical record is a confidential communication. It should be shared with health care providers only for the purpose of medical treatment.

A patient's medical record is confidential. The nurse should not disclose the patient's confidential medical information without the patient's consent. For example, a nurse should respect a wish not to inform the patient's family of a terminal illness. Similarly, a nurse should not assume that a patient's spouse or family members know all of the patient's history, particularly with regard to private issues such as mental illness, medications, pregnancy, abortion, birth control, or sexually transmitted infections.

Confidentiality is not an absolute value, however, and in certain circumstances, breaching confidentiality is justifiable. At times, a nurse may be required by law (statutory duty) to breach confidentiality and disclose information to a third party. For example, each province and territory has laws that require health care workers to report suspected child abuse to a local child protection agency. In some jurisdictions, statutes require the notification of the police when there has been a gunshot or a stab wound (*The Gunshot and Stab Wounds Mandatory Reporting Act*, S.M. 2008). Nurses may also be required to release information about a patient when they receive a subpoena (a legal order) to testify in court.

Nurses are under no legal obligation to release confidential information to the police except in rare cases in which the life, safety, or health of the patient or an innocent third party is in jeopardy (such as when a patient tells a nurse that he or she intends to hurt or kill someone). Such a statement should first be reported to the employer's administration or legal counsel before releasing it to the police (Canadian Nurses Protective Society [CNPS], 2008). Other admissions made by a patient to a nurse about past or future criminal activity may not have to be disclosed unless the nurse is compelled to do so by a court of law. The conflict between confidentiality and risk of public harm is not always clear. When a nurse has serious concerns about the welfare of others (e.g., if a patient is infected with human immunodeficiency virus [HIV] and admits to having unsafe sex or donating blood), the nurse should first suggest and strongly encourage the patient to disclose this information. If the patient refuses, the nurse should seek consultation with professional colleagues and supervisors. A careful balancing of the need for privacy and confidentiality of privileged communication would need to be weighed carefully.

Computers and Confidentiality. Most health care facilities use computer systems to maintain patient records. "Computerization in health care raises major legal concerns related to confidentiality of health records because of the potential for unauthorized access and data sharing" (Tapp, 2003). Access to confidential patient information is generally controlled by means of a variety of technological safeguards, including magnetized cards and passwords. It is important that these security devices not be shared with other people and that access cards are used to retrieve files only when warranted. The improper use of a magnetized card and password to seek out confidential information could lead to legal repercussions or disciplinary action.

The use of social media and other forms of electronic communication such as blogs, Facebook, Twitter, and YouTube are used by many as a way to communicate and network. Nurses must be extremely cautious about what information or images they post online, as any information in electronic form can be easily distributed and make its way into the public domain. There is the mistaken belief that deleted information

no longer exists, that privacy controls are totally secure, and that anonymous postings provide protection. Breaches of privacy legislation can lead to disciplinary action by the professional regulatory body, or civil lawsuits alleging defamation (CNPS, 2010). The best way to avoid the inadvertent disclosure of confidential or private information about patients is by maintaining professional boundaries, following employer policies, not posting or sharing any patient-related information online, and not making disparaging comments about your employers or colleagues, as these may be viewed as defamatory (CNPS, 2003).

False Imprisonment. The tort of false imprisonment serves to protect a person's individual liberty and basic rights. Preventing a patient from leaving a health care facility voluntarily may constitute the tort of false imprisonment. The inappropriate or unjustified use of restraints (e.g., by confining a person to an area, or by using physical or chemical restraints) may also be viewed as false imprisonment. Nurses must be aware of their facility's policies and specific legislation in their jurisdiction (e.g., under the *Mental Health and Consequential Amendments Act*, 1998) relating to when and how restraints can be used (CNPS, 2004).

Unintentional Torts

Negligence. When nurses are sued, most often the proceedings against them are for the tort of negligence, also referred to as malpractice (Sneiderman et al., 2003). **Negligence** in nursing is conduct that does not meet a standard of care established by law. No intent is needed for negligence to occur. It is characterized chiefly by inadvertence, thoughtlessness, or inattention. Negligence may involve carelessness, such as not checking an identification bracelet, which results in administration of the wrong medication. However, carelessness is not always the cause of misconduct. If nurses perform a procedure for which they have not been educated and do so carefully but still harm the patient, a claim of negligence can be made. In general, courts define nursing negligence as the failure to use the degree of skill or learning ordinarily used under the same or similar circumstances by members of the nursing profession (Box 8-2).

Nurses can be found liable for negligence if the following criteria are established: (1) The nurse (defendant) owed a duty to the patient (plaintiff); (2) the nurse did not carry out that duty; (3) the patient was injured; and (4) the nurse's failure to carry out the duty caused the injury.

The ability to predict harm (i.e., the foreseeability of risk) is evaluated in negligence cases. The circumstances surrounding the injury are evaluated to determine whether it was likely that

the injury or harm to the patient could have been expected from the care that was or was not provided. The cause of the injury is also investigated through the evaluation of the actual and the nearest causes of the injury. Had it not been for what the nurse did or did not do, could an injury have been prevented?

The case of *Downey v. Rothwell* (1974) is an example of nursing negligence. This case involved a plaintiff who suffered a severe arm injury when she fell off an examining table while under the care of a nurse. The patient, who had a history of epilepsy, informed the nurse that she was about to have a seizure. The nurse left the patient unattended on an examining table while she left the room for a few moments. During this time, the patient had a seizure, fell onto the floor, and broke her arm. The nurse should have anticipated that the patient could have fallen during a seizure and ensured her safety either by moving her to the floor or by putting up guardrails on the examining table. This case involved an undertaking by the nurse to provide care, a reliance by the patient on this nurse, and a foreseeable risk. The nurse was found negligent in this case, and her employers were held vicariously liable. "Vicarious liability is a legal doctrine that applies in situations where the law holds the employer legally responsible for the acts of its employees that occur within the scope and course of their employment" (CNPS, 1998).

In the case of *Granger v. Ottawa General Hospital* (1996), two nurses (a staff nurse and her team leader) were found negligent in the care they provided to a woman in labour. During labour, the plaintiff's fetal heart monitor strip showed deep, persistent, variable decelerations. The staff nurse did not appreciate that these were a sign of fetal distress and did not immediately report these findings to other members of the obstetrical team. The ensuing delay in care resulted in severe and permanent brain injury in the baby, leaving her severely disabled. In this case, the nurses breached their duty to exercise appropriate skill in making an assessment and to communicate the information to the physicians.

Preventing Negligence. The best way for nurses to avoid being negligent is to follow standards of care; give competent health care; insist on appropriate orientation, continuing education, and adequate staffing; communicate with other health care providers; develop a caring rapport with the patient; and document assessments, interventions, and evaluations fully.

The health care record, or "chart," is a permanent record of the nursing process. The courts consult the patient's chart for a chronological record of all aspects of care provided from admission to discharge. "Courts use nursing documentation at trial to reconstruct events, establish times and dates, refresh memories of witnesses and . . . resolve conflicts in testimony" (CNPS, 2007a). As a legal document, it is the most comprehensive record of the care provided. Careful, complete, and thorough documentation is one of the best defences against allegations of negligence or violations of nursing standards (see Chapter 15). The record can show that even in the event of an adverse patient outcome, the nursing care that was provided met the expected standards. An institution has a legal duty to maintain nursing records. Nursing notes contain substantial evidence needed in order to understand the care received by a patient. If records are lost or incomplete, the care is presumed to have been negligent and therefore the cause of the patient's injuries. In addition, incomplete or illegible records undermine the credibility of the health care provider.

In the case of *Kolesar v. Jeffries* (1976), the Supreme Court of Canada addressed the issue of poor record keeping. In that

► BOX 8-2 Common Negligent Acts

- Medication errors that result in injury to patients
- Intravenous therapy errors that result in infiltrations or phlebitis
- Burns caused by equipment, bathing, or spills of hot liquids and foods
- Falls resulting in injury to patients
- Failure to use aseptic technique as required
- Errors in sponge, instrument, or needle counts in surgical cases
- Failure to give a report, or giving an incomplete report, to an incoming shift of health care staff
- Failure to monitor a patient's condition adequately
- Failure to notify a physician of a significant change in a patient's status

case, a patient underwent major spinal surgery and was transferred to a surgical unit, where he was nursed on a Stryker frame. The patient was found dead the following morning. No nursing notes were recorded from 2200 hours the previous evening until 0500 hours, when he was found dead. Although at trial several nurses and nursing assistants testified that they had tended to the patient multiple times throughout the night, the court inferred that “nothing was charted because nothing was done.” One of the nurses was held negligent in this patient’s death.

It is very important for documentation to be accomplished in a timely manner. Any significant changes in the patient’s condition must be reported to the physician and documented in the chart (see Chapter 15). Recording nursing care notes in a notebook and then transferring them to the chart at the end of the shift can be a dangerous practice. If this practice is followed, other health care providers may administer medications or provide care to the patient without up-to-date information. Harm may come to a patient whose record is not accurate and current. Nurses must always follow the particular style of charting adopted by their employer (CNPS, 2007a).

Truthful documentation is also essential. If an error is made in the documentation, it is important to follow the policies and procedures of the institution to correct it. Obliterating or erasing errors may appear to be concealing misconduct and lead to charges of fraud. The credibility of a nurse who goes to court is negatively affected if it appears that the nurse’s initial charting has been changed after an injury has occurred to a patient. This scenario is exemplified in the case of *Meyer v. Gordon* (1981). Nurses did not adequately monitor a woman in labour, and their notes were sloppy and vague. The fetus experienced severe distress, required resuscitation on delivery, and was transferred to another hospital. When a nurse realized that the documentation was deficient, she altered it. However, the original chart had already been photocopied and sent to the second hospital. At trial, it was obvious that the original document had been tampered with. The court held that the nursing staff had been negligent in several ways, and the judge severely condemned the nurse’s tampering with the evidence. The court commented as follows: “My criticism of the defendant hospital is not confined to the lack of care of its nursing staff. The hospital chart contains alterations and additions which compel me to view with suspicion the accuracy of many of the observations which are recorded.”

Nurses should also be familiar with the current nursing literature in their areas of practice. They should know and follow the policies and procedures of the institution in which they work. Nurses should be sensitive to common sources of injury to patients, such as falls and medication errors. Nurses must communicate with the patient, explain the tests and treatment to be performed, document that specific explanations were provided to the patient, and listen to the patient’s concerns about the treatment.

Nurse–patient relationships are very important not only in ensuring quality care but also in minimizing legal risks. Trust develops between a nurse and patient. Patients who believe that the nurses performed their duties correctly and were concerned with their welfare are less likely to initiate a lawsuit against the nurses. Sincere caring for patients is an essential role of the nurse and is an effective risk-management tool. However, caring does not protect nurses completely if negligent practice occurs. When a patient is injured, the

investigation into the incident may implicate the nurses even if the patient feels kindly toward them.

Criminal Liability

Although most nursing liability issues involve private law matters (e.g., torts), the criminal law is also relevant. Canadian nurses have been charged with criminal offences such as assault, administering a noxious substance, and criminal negligence that causes death (a category of manslaughter). The difference between the tort of negligence and criminal negligence charges is the degree to which the act deviated from the standard of a reasonably competent practitioner. For example, in the case of criminal negligence, the courts must prove that the nurse was extremely careless, indicating “wanton or reckless disregard for the lives or safety of other persons” (*Criminal Code*, 1985, Part VIII, Section 219 [1]).

Consent

A signed consent form is required for all routine treatment, procedures such as surgery, some treatment programs such as chemotherapy, and research involving patients. A patient signs general consent forms when admitted to the hospital or other health care facility. The patient or the patient’s representative must sign a special consent or treatment form before each specialized procedure or treatment. “If a person receiving care is clearly incapable of consent, the nurse respects the law on capacity assessment and substitute decision making in his or her jurisdiction” (CNA, 2008, p. 11; see also CNPS, 2009b). Provincial and territorial laws describe what constitutes the legal ability to give consent to medical treatment. Nurses should know the law in their own jurisdiction and be familiar with the policies and procedures of their employing institution with regard to consent.

In general, the following factors must be verified for consent to be legally valid:

- The patient must have the legal and mental capacity to make a treatment decision.
- The consent must be given voluntarily and without coercion.
- The patient must understand the risks and benefits of the procedure or treatment, the risks of not undergoing the procedure or treatment, and any available alternatives to the procedure or treatment.

If a patient is deaf, is illiterate, or does not speak the language of the health care providers, an official interpreter must be available to explain the terms of consent. A family member or acquaintance who is able to speak a patient’s language should not be used to interpret health information except as a last resort. A patient experiencing the effects of a sedative is not able to clearly understand the implications of an invasive procedure. Every effort should be made to assist the patient in making an informed choice.

Nurses must be sensitive to the cultural issues of consent. The nurse must understand the way in which patients and their families communicate and make important decisions. It is essential for nurses to understand the various cultures with which they interact. The cultural beliefs and values of the patient may be very different from those of the nurse. It is important for nurses not to impose their own cultural values on the patient (see Chapter 9).

Informed Consent

“Nurses ensure that nursing care is provided with the person’s informed consent. Nurses recognize and support a capable person’s

right to refuse or withdraw consent for care or treatment at any time" (CNA, 2008, p. 11).

Informed consent is a person's agreement to allow a medical action to happen, such as surgery or an invasive procedure, on the basis of a full disclosure of the likely risks and benefits of the action, alternatives to the action, and the consequences of refusal (Garner & Black, 2009). Informed consent creates a legal duty for the physician or other health care provider to disclose material facts in terms that the patient can reasonably understand in order to make an informed choice (Sneiderman et al., 2003). The explanation should also describe treatment alternatives, as well as the risks involved in all treatment options. Failure to obtain consent in situations other than emergencies may result in a claim of battery. In the absence of informed consent, a patient may bring a lawsuit against the health care provider for negligence, even if the procedure was performed competently. Informed consent requires the provision of adequate information for the patient to form a decision and the documentation of that decision.

The following materials are required for informed consent (Sneiderman et al., 2003):

- A brief, complete explanation of the procedure or treatment
- Names and qualifications of people performing and assisting in the procedure
- A description of any possible harm, including permanent damage or death, that may occur as a result of the procedure
- An explanation of therapeutic alternatives to the proposed procedure or treatment, as well as the risks of doing nothing. Patients also need to be informed of their right to refuse the procedure or treatment without discontinuing other supportive care and of their right to withdraw their consent even after the procedure has begun.

Informed consent is part of the physician–patient relationship. Because nurses do not perform surgery or direct medical procedures, obtaining patients' informed consent is not usually one of nurses' duties. Even though the nurse may assume the responsibility for witnessing the patient's signature on the consent form, the nurse does not legally assume the duty of obtaining informed consent. The nurse's signature witnessing the consent does not mean that the nurse has provided information about risks and alternatives of a particular procedure, only that the patient voluntarily gave consent, that the patient's signature is authentic, and that the patient appears to be competent to give consent (Sneiderman et al., 2003). When nurses provide consent forms for patients to sign, the patients should be asked whether they understand the procedures to which they are consenting. If they deny understanding or if the nurse suspects that they do not understand, the nurse must notify the physician or nursing supervisor. Some consent forms also have a line for the physician to sign after explaining the risks and alternatives to a patient. Such a form is helpful in a court case when a patient alleges that consent was not informed. If a patient refuses treatment, this rejection should also be written, signed, and witnessed.

If a patient participates in an experimental treatment program or submits to use of experimental drugs or treatments, the informed consent form must be even more detailed and stringently regulated. An organization's institutional review board should review the information in the consent form for research involving human subjects. The patient may withdraw from the experiment at any time (see Chapter 7).

Many procedures that nurses perform (e.g., insertion of intravenous or nasogastric tubes) do not require formal written consent; nonetheless, patients' right to give or refuse consent to treatment must be protected. Implied consent to treatment is often involved in nursing procedures. For example, when the nurse approaches the patient with a syringe in hand and the patient rolls over to expose the injection site, consent is implied. If the patient resists the injection either verbally or through actions, the nurse must not proceed with the injection. Forcing or otherwise treating a patient without consent could result in criminal or civil charges of assault and battery. Many advanced practice nurses are now autonomously treating patients. It is therefore likely that formal written consent for nursing procedures will also be expected for the treatment received from advance practice nurse specialists.

Parents are usually the legal guardians of pediatric patients, and, therefore, consent forms for treatment must be signed by parents. If the parents are divorced, the form must be signed by the parent with legal custody. On occasion, a parent or guardian refuses treatment for a child. In those cases, the court may intervene in the child's behalf. The practice of making the child a ward of the court and administering necessary treatment is relatively common in such cases.

The example of 13-year-old Tyrell Dueck from Saskatchewan illustrates such a case. The teenager received a diagnosis of cancer in 1998. He completed part of the chemotherapy treatment when he decided that he did not want more treatment or the recommended amputation of his leg, believing that he had been "cured by God" and that further treatment was unnecessary. His statements were consistent with his family's Christian value system. Following his parents' advice, the boy wished to undergo alternative therapy at a clinic in Mexico. The treating physicians maintained that without further conventional treatment, Tyrell would die within a year. A judge concluded that Tyrell had been given inaccurate information by his father about the benefits and risks of the proposed alternative therapy and, therefore, was unable to make an informed consent or refusal. Thus, the family's wishes to forgo conventional treatment were legally overruled, and the boy's grandparents were to take him for treatments. Before the enforced treatment could be started, however, tests revealed that the cancer had already spread and the treatment would no longer be helpful. The teenager was returned to the care of his parents, and he died a short time later.

In some instances, obtaining informed consent is difficult or simply not possible. If, for example, the patient is unconscious, consent must be obtained from a person legally authorized to give consent on the patient's behalf. Other surrogate decision makers may have legally been delegated this authority through proxy directives or court guardianship procedures. In emergency situations, if it is impossible to obtain consent from the patient or an authorized person, the procedure required to benefit the patient or save the patient's life may be undertaken without liability for failure to obtain consent. In such cases, the law assumes that the patient would wish to be treated. This is referred to as the emergency doctrine.

Patients with mental health problems and frail older adults must also be given the opportunity to give consent. They retain the right to refuse treatment unless a court has legally determined that they are incompetent to decide for themselves.

Nursing Students and Legal Liability

Nursing students must know their own capabilities and competencies and must not perform nursing actions unless

competent to do so. "However, if a student nurse performs a nursing action which is one an RN would perform (e.g. administration of an I.M. [intramuscular] injection), that student will be held to the standard of an RN. Student nurses, like all other nurses, are accountable for their own actions" (Phillips, 2002). In a few reported cases in Canada, nursing students were sued for negligence in their care of patients. A nursing student in Nova Scotia who caused permanent injury in a patient through an improperly administered intramuscular injection was found negligent, and the hospital was found vicariously liable for the student's actions (CNPS, 2007b; *Roberts v. Cape Breton Regional Hospital*, 1997). Thus, nursing students are liable if their actions cause harm to patients. However, if a patient is harmed as a direct result of a nursing student's actions or lack of action, the liability is generally shared by the student, the instructor, the hospital or health care facility, and the university or educational institution. Nursing students should never be assigned to perform tasks for which they are unprepared, and they should be carefully supervised by instructors as they learn new skills. Although nursing students are not considered employees of the hospital, the institution has a responsibility to monitor their acts. Nursing students are expected to ensure that their student status is known to patients and to perform as professional nurses would in providing safe patient care. Faculty members are usually responsible for instructing and observing students, but in some situations, staff nurses serving as preceptors may share these responsibilities. Every nursing school should provide clear definitions of student responsibility, preceptor responsibility, and faculty responsibility (Phillips, 2002).

When students are employed as nursing assistants or nurses' aides when not attending classes, they should not perform tasks that do not appear in a job description for a nurses' aide or assistant. For example, even if a student has learned to administer intramuscular medications in class, this task may not be performed by a nurses' aide. If a staff nurse overseeing the nursing assistant or aide knowingly assigns work without regard for the person's ability to safely conduct the task as defined in the job description, that staff nurse is also liable. If students employed as nurse's aides are requested to perform tasks that they are not prepared to complete safely, this information should be brought to the nursing supervisor's attention so that the needed help can be obtained.

The Web site of the CNPS (<http://www.cnps.ca/> through its members-only-section) is an excellent resource available to nursing students, providing information about legal risks nurses face in practice. However, nursing students are not entitled to receive legal consultation services or financial assistance from the CNPS; these services are provided only for the benefit of eligible registered nurses.

Professional Liability Protection

Most nurses in Canada are employed by publicly funded health care facilities that carry malpractice insurance. These facilities are considered employers and therefore are vicariously liable for negligent acts of their employees as long as the employees were working within the normal scope and course of practice (Keatings & Smith, 2010).

Because of this legal principle, an employer will generally be liable to those who may have suffered damages as a result of the negligence of an employee. Consequently, a patient who considers himself or herself to have been injured by the actions of an employee will often look to the employer for compensation (CNPS, 1998). This legal principle does not apply when

the employee is working outside the normal scope of his or her employment. Accordingly, a nurse who is self-employed or engages in activities that are not related to his or her employment (even if they are undertaken on the employer's premises) is solely liable for his or her own negligence. All nurses should be aware of their employment status as well as the availability and extent of their professional liability coverage.

The CNPS is a nonprofit society established in 1988 to provide legal support and liability protection to nurses. The services of CNPS are available as a benefit of membership in a subscribing provincial or territorial professional association or college. The only two jurisdictions in Canada in which registered nurses are not eligible for CNPS services are British Columbia and Quebec. Registered nurses in British Columbia are covered by their own insurance corporation, and those in Quebec have commercial insurance available through the Order of Nurses of Quebec. CNPS services are otherwise available to nurses in a variety of work settings, including independent practice and volunteer settings. Eligible nurses can obtain confidential assistance from a nurse lawyer by contacting the CNPS toll-free by telephone, Monday to Friday from 0845 to 1630 Eastern Standard Time or Eastern Daylight Time at 1-800-267-3390. A nurse providing emergency assistance at an accident scene may not be covered by an employer's insurance policy because the care given would not fall within the scope of employment. However, some provinces have adopted "Good Samaritan" laws (e.g., Alberta's *Emergency Medical Aid Act*, 2000) that prevent voluntary rescuers from being liable for negligent care provided during a rescue unless it can be proved that they displayed gross negligence. Nurses must be familiar with these laws in their own province or territory.

Abandonment, Assignment, and Contract Issues

Short Staffing. During nursing shortages or periods of staff downsizing, the issue of inadequate staffing may arise. Legal problems may result if the number of nurses is insufficient or if an appropriate mix of staff to provide competent care is lacking. If assigned to care for more patients than is reasonable, nurses should bring this information to the attention of the nursing supervisor. In addition, a written protest such as a workload or staffing report form should be completed to document the nurse's concerns about patient safety. Most provinces and territories have some reporting mechanism in place to document heavy workload or staffing situations. Although such a protest may not relieve nurses of responsibility if a patient suffers injury because of inattention, it would show that they were attempting to act reasonably. Whenever a written protest is made, nurses should keep a copy of this document in their personal files. Most administrators recognize that knowledge of a potential problem shifts some of the responsibility to the institution.

Nurses should not walk out when staffing is inadequate, because charges of abandonment could be made. A nurse who refuses to accept an assignment may be considered insubordinate, and patients would not benefit from having even fewer staff available. It is important to know the institution's policies and procedures and the nursing union's collective agreement on how to handle such circumstances before they arise.

Floating. Nurses are sometimes required to "float" from the area in which they normally practise to other nursing units. Nurses must practise within their level of competence. Nurses should not be floated to areas where they have not been adequately cross-trained. Nurses who float should inform the

nursing supervisor of any lack of experience in caring for the type of patients on the nursing unit. They should also request and be given orientation to the unit. A nursing supervisor can be held liable if a staff nurse is given an assignment he or she cannot safely perform. In one case (*Dessauer v. Memorial General Hospital*, 1981), a nurse in obstetrics was assigned to an emergency room. A patient entered the emergency room, complaining of chest pain. The obstetrical nurse gave the patient too high a dosage of lidocaine, and the patient died after suffering irreversible brain damage and cardiac arrest. The nurse lost the negligence lawsuit.

Physicians' Orders. The physician is responsible for directing medical treatment. Nurses are obligated to follow physicians' orders unless they believe the orders are in error, violate hospital policy, or would harm patients. Therefore, all orders must be assessed, and if an order is found to be erroneous or harmful, further clarification from the physician is necessary. If the physician confirms the order and the nurse still believes it is inappropriate, the supervising nurse should be informed. A nurse should not proceed to perform a physician's order if harm to the patient is foreseeable. The nursing supervisor should be informed of and given a written memorandum detailing the events in chronological order; the nurse's reasons for refusing to carry out the order should also be written, to protect the nurse from disciplinary action. The supervising nurse should help resolve the questionable order. A medical or pharmacy consultant may be called in to help clarify the appropriateness or inappropriateness of the order. A nurse carrying out an inaccurate or inappropriate order may be legally responsible for any harm suffered by the patient.

In a negligence lawsuit against a physician and a hospital, one of the most frequently litigated issues is whether the nurse kept the physician informed of the patient's condition. To inform a physician properly, nurses must perform a competent nursing assessment of the patient to determine the signs and symptoms that are significant in relation to the attending physician's tasks of diagnosis and treatment. Nurses must be certain to document that the physician was notified and to document his or her response, the nurse's follow-up, and the patient's response. For example, nurses noticed that a patient with a cast on his leg was experiencing poor circulation in his foot. The nurses recorded these changes but did not notify the physician. Gangrene subsequently developed in the patient, and an amputation was required. The hospital, physician, and nursing staff were all charged with negligence.

The physician should write all orders, including "do not resuscitate" (DNR) orders, which many physicians are reluctant to write out because they fear legal repercussions for criminal neglect or failure to act. The nurse must make sure that orders are transcribed correctly. Verbal orders are not recommended because they increase the possibilities for error. If a verbal order is necessary (e.g., during an emergency), it should be written and signed by the physician as soon as possible, usually within 24 hours. The nurse should be familiar with the institution's policy and procedures regarding verbal orders.

Dispensing Advice Over the Phone. Providing advice over the telephone is a high-risk activity because diagnosing over the phone is extremely difficult. The nurse is legally accountable for advice given over the phone. The most common allegations of negligence in this area are provision of inadequate advice, improper referrals, and failure to refer (CNPS, 2009a). It is essential that nurses precisely follow institutional

guidelines and policies and thoroughly document each call to avoid serious repercussions for all parties.

Contracts and Employment Agreements. In Canada, most nurses belong to unions or associations that engage in collective bargaining on behalf of a group. The collective agreements between employers and union members are written contracts that set out the conditions of employment (e.g., salary, hours of work, benefits, layoffs, and termination). Many laws, including labour laws, apply to nurses. For example, laws outline eligibility for and details of workers' compensation and maternity benefits. It is important for nurses to understand the employment laws in the province or territory where they work.

By accepting a job, a nurse enters into an agreement with an employer. The nurse is expected to perform professional duties competently, adhering to the policies and procedures of the institution. In return, the employer pays for the nursing services and ensures that facilities and equipment are adequate for safe care.

Legal Issues in Nursing Practice

Abortion

In the 1988 case of *R. v. Morgentaler*, the Supreme Court of Canada ruled that the *Criminal Code* (1985) regulations on legal access to abortion were unconstitutional. The *Criminal Code* had required a woman seeking abortion to secure the approval of a hospital-based committee before the procedure could be performed. By rejecting the *Criminal Code* provisions, the Supreme Court in effect referred the abortion issue to Parliament, but Parliament has not rewritten a criminal law policy on abortion. Abortion is thus unregulated by law, which is tantamount to its legalization. However, the legal entitlement to abortion does not mean abortion services are readily available. Because health care facilities are not obliged to offer abortions, many do not do so. Thus, access remains a continuing issue.

Drug Regulations and Nurses

Canadian law closely regulates the administration of drugs. Two federal acts control the manufacture, distribution, and sale of food, drugs, cosmetics, and therapeutic devices in Canada: the *Food and Drugs Act* (1985) and the *Controlled Drugs and Substances Act* (1996). The *Food and Drugs Act* lists the drugs that can be sold only by prescription (e.g., antibiotics) and drugs that are subject to stringent controls (e.g., barbiturates, amphetamines). The distribution of these drugs requires specific handling and record keeping. The *Controlled Drugs and Substances Act* controls the manufacture, distribution, and sale of narcotics (e.g., morphine, codeine). However, it also regulates other drugs that are controlled in the same manner as narcotics, such as cocaine and marijuana. Most institutions have policies about medication administration and record keeping, especially for controlled drugs and narcotics. Nurses must be aware of their employer's policies.

Nurses are not legally entitled to prescribe drugs. However, in several jurisdictions, nurse practitioners may prescribe certain non-narcotic drugs specific to their area of practice.

The administration of medications in accordance with a physician's prescription is a basic nursing responsibility. A competent nurse is expected to know the purpose and effect of any drug administered, as well as potential side effects and contraindications. It is also a nurse's responsibility to question any physician's orders that may be incorrect or unsafe. A nurse

who follows a physician's order that is unclear or incorrect may be found negligent, disciplined, or dismissed by the employer, or investigated by the professional regulatory body (CNPS, 2007a).

Communicable Diseases

The care of people with communicable conditions such as HIV infection, acquired immunodeficiency syndrome (AIDS), hepatitis, or severe acute respiratory syndrome (SARS) or during a possible influenza pandemic has legal implications for nurses. Health care workers are at risk for exposure to communicable diseases because of the nature of their work. Despite the best attempts to protect oneself against communicable diseases through the proper and consistent use of protective gear (e.g., latex gloves or masks), accidental needle-stick injuries or life-threatening illnesses such as SARS can occur. Nurses have an ethical and legal obligation to provide care to all assigned patients, and employers have an obligation to provide their employees with necessary protective gear. However, there may be "some circumstances in which it is acceptable for a nurse to withdraw from care provision or to refuse to provide care" (College of Registered Nurses of British Columbia [CRNBC], 2007, p. 1; see also College of Registered Nurses of Nova Scotia, 2006). "Unreasonable burden is a concept raised in relation to duty to provide care and withdrawing from providing or refusing to provide care. An unreasonable burden may exist when a nurse's ability to provide safe care and meet professional standards of practice is compromised by unreasonable expectations, lack of resources, or ongoing threats to personal wellbeing" (CNA, 2008; see also CRNBC, 2007, p. 1).

In all cases involving privacy, confidentiality, and disclosure, the rights of the patients with a communicable disease must be balanced with the rights of the public or of health care providers. Both civil and criminal liability can result if private information is disclosed without authorization. Nurses must understand the reporting laws in the province or territory in which they practise. Courts can order disclosure of the records of patients with AIDS in situations that are not addressed by a statute, even without the patient's consent. Whenever information about a patient is requested by any third parties, including insurance companies or employers, nurses must obtain a signed release from the patient before releasing confidential information. Not every health care provider who comes in contact with a patient has a need to know the patient's HIV status. Confidential information must be protected.

The courts have upheld the employer's right to fire a nurse who refuses to care for a patient with AIDS. Nurses who flatly refuse to care for HIV infected patients or possibly a patient with SARS may be reprimanded or fired for insubordination. According to the CNA's (2008) *Code of Ethics for Registered Nurses*, nurses must not discriminate in the provision of nursing care on the basis of factors such as a person's sexual orientation, health status, or lifestyle (p. 13). One limitation outlined in the code regarding a nurse's right to refuse care to a patient is that nurses are not obligated to comply with a patient's wishes when those wishes are contrary to the law (e.g., assisting the patient to commit suicide). If the care requested is contrary to the nurse's personal values, such as assisting with an abortion, the nurse must provide appropriate care until alternative care arrangements are arranged.

Nurses must be concerned with balancing the right to protect themselves with protection of the patient's rights. Both are afforded protection against discrimination and protection

of privacy by human rights legislation. Most current legal cases involving nurses and communicable diseases are related to the protection needed for nurses as employees. Strict compliance with standard precautions and routine practices and the use of transmission-based precautions (e.g., against airborne or droplet transmission) for patients known or suspected of having other serious illnesses is the nurse's wisest strategy (see Chapter 32).

Death and Dying

Many legal issues surround the event of death, including a basic definition of when a person is considered dead. The only province that has a statutory definition of death is Manitoba, which defines it as "the irreversible cessation of all brain function" (*Vital Statistics Act*, 1987). However, this "brain death" definition has become standard medical practice across Canada. Until the 1960s, death was defined as the irreversible cessation of cardiopulmonary function. However, two developments at that time necessitated a shift to consideration of the brain: (1) the emergence of artificial life-support devices that could maintain cardiopulmonary functioning in a brain-dead person and (2) the emergence of organ transplantation. Death had to be redefined so that organs could be donated.

Ethical and legal questions are raised by the related issues of euthanasia and assisted suicide. **Euthanasia** is an act undertaken by one person with the motive of relieving another person's suffering and the knowledge that the act will end the life of that person (Downie, 2004). In Canada, euthanasia is illegal. It is legally irrelevant whether the patient has consented to the act because according to Section 14 of the *Criminal Code* (1985), "no person can consent to have death inflicted on him." Furthermore, according to Section 241 of the *Criminal Code*, it is an offence to "aid a person to commit suicide, whether suicide ensues or not."

On the other hand, the law draws a distinction between "killing" and "letting die." Euthanasia and assisted suicide are considered "killing." Withholding or withdrawing life-prolonging treatment is considered "letting die." The disease process causes the patient to die a natural death. Thus, a mentally competent patient has the legal right to refuse life-prolonging treatment. If, for example, such a patient requests that a ventilator be disconnected, understanding that she will die as a result, her wishes must be honoured in accordance with the principle of "no treatment without consent."

In the case of *Nancy B. v. Hôtel-Dieu de Québec* (1992), a young, mentally competent patient who was totally and permanently paralyzed by a neurological disease had twice asked that her ventilator be disconnected. After the second refusal, she sought a court order to enforce her will. The order was granted by the Quebec Superior Court, which ruled that as a mentally competent patient, she could not be treated without consent. Also, even if a patient has not asked for the termination of life-prolonging treatment (either directly or by way of an advance directive), physicians are still allowed, after consultation with family members, to terminate such treatment when it no longer offers any reasonable hope of benefit to the person. When patients reject life-prolonging treatment, the nurse focuses on the goal of caring versus curing.

Right-to-die legislation is currently being challenged in Canada for the first time since 1993 when the Supreme Court of Canada ruled 5 to 4 against giving Sue Rodriguez the right to die by assisted suicide. The Victoria woman, who had amyotrophic lateral sclerosis (ALS), later ended her life by suicide.

On November 14, 2011, the Supreme Court of British Columbia began hearing arguments in a constitutional challenge to the *Criminal Code* sanctions against physician-assisted suicide. The trial, known as *Carter v. Attorney General of Canada*, has been brought forward by the B. C. Civil Liberties Association and a group of individuals, including Gloria Taylor, who, like Sue Rodriguez, is afflicted with ALS (*Carter v. Canada [Attorney General]*, 2011 BCSC 1371). Nurses must be aware of changes that take place as laws continue to evolve.

Advance Directives and Health Care Surrogates

The **advance directive** is a mechanism enabling a mentally competent person to plan for a time when he or she may lack the mental capacity to make medical treatment decisions. It takes effect only when the person becomes incompetent to speak for himself or herself. The advance directive is a more sophisticated concept than that of the living will, although the two terms are often confused. A **living will** is a document in which the person makes an anticipatory refusal of life-prolonging measures during a future state of mental incompetence. An advance directive, in contrast, is not restricted to the rejection of life-support measures; its focus is on treatment preferences, which may include both requests for and refusals of treatment. The advance directive assumes two forms: the instructional directive (in which the maker of the document spells out specific directions for governing care, in more detail than is generally found in the living will), and the proxy directive (in which the person appoints someone as a health care agent to make treatment decisions on his or her behalf). Legislation in British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Prince Edward Island, Newfoundland and Labrador, and the Yukon gives full legal effect to both kinds of directives; the proxy directive is also recognized in Quebec and Nova Scotia. Even in provinces and territories that do not recognize an instructional directive, nothing prohibits a physician from following a directive.

If nurses know about the existence of a health care directive, they are required to follow it. Nurses are also required to follow the wishes of a validly appointed proxy (assuming these instructions are legal). A proxy has the right to receive all medical information concerning the patient's condition and proposed plan of care. Failure to comply with a proxy's directions could result in charges of battery.

If a physician ignores the advance directive, the nurse must bring the advance directive to the physician's attention and document that he or she did so, along with the physician's response to this information. The nurse should also notify the nursing supervisor, who can then give direction regarding institutional policies and guidelines for such circumstances.

The psychiatric advance directive is a new type of advance directive. An individual with mental health problems completes this type of directive during periods of mental stability and competence. The directive outlines how the patient wishes to be treated in the future if the underlying mental illness causes him or her to lose decision-making capacity. For example, it may specify preferences for and against certain interventions (e.g., electroconvulsive therapy) or medications. The psychiatric advance directive can also designate a surrogate decision maker to act on the person's behalf in the event of an incapacitating mental health crisis.

Organ Donation

Legally competent people are free to donate their bodies or organs for medical use. Every province and territory has

human tissue legislation that provides for both the *inter vivos* (live donor) and postmortem (cadaveric) donation of tissues and organs. For example, a mentally competent adult is allowed to donate a kidney, a lobe of the liver, or bone marrow. Statutes provide that adults may consent to organ donation after death. If the deceased has left no direction for postmortem donation, consent may be obtained from the person's family. In two provinces—Manitoba and Nova Scotia—the statutes contain "required request" provisions that take effect when a deceased person did not consent to organ removal but is considered a good donor candidate. In such an event, the physician is legally obliged to seek permission from the family. In many hospitals, a nurse transplantation coordinator performs this function.

Mental Health Issues

Treating patients with mental health problems raises legal and ethical issues. Provincial mental health legislation such as the *Mental Health and Consequential Amendments Act* (1998) provides direction for health care providers, protects patient autonomy, and recognizes that some individuals with severe mental health problems may lack the ability to appreciate the consequences of their health condition.

A patient can be admitted to a psychiatric unit involuntarily or on a voluntary basis. Patients admitted on a voluntary basis should be treated no differently than any other patient. They have the right to refuse treatment and the right to discharge themselves from hospital. However, provincial or territorial mental health legislation provides that if the patient may cause harm to self or others, police officers (or other authorized parties) may bring the patient to a health care facility for examination and treatment without the patient's consent (Sneiderman et al., 2003).

Potentially suicidal patients may be admitted to psychiatric units. If the patient's history and medical records indicate suicidal tendencies, the patient must be kept under supervision. A lawsuit may result if a patient attempts suicide within the hospital. The allegations in the lawsuits would be that the institution failed to provide adequate supervision or safeguard the facilities. Documentation of precautions against suicide is essential.

Public Health Issues

It is important that nurses, especially those employed in community health settings, understand the public health laws. Public health acts, which have been enacted in all provinces and territories, are directed toward the prevention, treatment, and suppression of communicable disease (Sneiderman et al., 2003). Community health nurses have the legal responsibility to follow the laws enacted to protect the public health. These laws may include reporting suspected abuse and neglect, such as child abuse, elder abuse, or domestic violence; reporting communicable diseases; and reporting of other health-related issues enacted to protect the public's health.

Some provinces (e.g., Ontario and New Brunswick) have legislation that requires proof of immunization for school entry. In these provinces, however, exceptions are permitted on medical or religious grounds and for reasons of conscience (Health Canada, 1997). Although a signed consent form is not required for an immunization, nurses are advised to obtain some documentation (evidence) that they discussed the risks and benefits with the parent or legal guardian. Nurses should be aware of their employer guidelines for documentation.

Every province and territory has child abuse legislation that requires health care providers, such as nurses, to report witnessed or suspected child abuse or neglect directly to child protection agencies. To encourage reports of suspected cases, the laws offer legal immunity for the reporter if the report is made in good faith. Health care providers who do not report suspected child abuse or neglect may be held liable for civil or criminal action. Several provinces and territories also have laws that require health care workers to report witnessed or suspected abuse of patients within facilities (e.g., *The Protection of Persons in Care Act*, 2000, in Manitoba). These reports must be made directly to a public authority. Even if public reporting is not required, nurses should report all suspicions of patient abuse to their nursing supervisors. It is essential for nurses to know their provincial or territorial laws and employer policies regarding the reporting of abuse.

Risk Management

Risk management is a system of ensuring appropriate nursing care by identifying potential hazards and eliminating them before harm occurs (Guido, 2006). The steps involved in risk management include identifying possible risks, analyzing them, acting to reduce them, and evaluating the steps taken.

One tool used in risk management is the **incident report**, or **adverse occurrence report**. When a patient is harmed or endangered by incorrect care, such as a drug error, a nurse completes an incident report (see Chapter 15). Such reports are analyzed to determine how future problems can be avoided. For example, if incident reports show that drug errors commonly involve a new intravenous pump, the risk manager must ensure that staff members have been properly trained in its use. In-service education may be all that is necessary to prevent future errors.

The underlying rationale for quality assurance in risk-management programs is the highest possible quality of care. Some insurance companies and medical and nursing organizations require the use of quality assurance and risk-management procedures. Quality care is the responsibility of both the employer and the individual provider.

Risk management requires sufficient documentation. The nurse's documentation can be the evidence of what actually was done for a patient and can serve as proof that the nurse acted reasonably and safely. Documentation should be thorough, accurate, and performed in a timely manner. When a lawsuit is being evaluated, the nurse's notes are very often the first record to be reviewed by the plaintiff's counsel. If the nurse's credibility is questioned because of these documents, the risk of greater liability exists for the nurse. The nurse's notes are risk-management and quality assurance tools for the employer and the individual nurse.

Professional Involvement

Nurses must be involved in their professional organizations and on committees that define the standards of care for nursing practice. If current laws, rules and regulations, or policies under which nurses must practise do not reflect reality, nurses must become involved as advocates to see that the scope of nursing practice is accurately defined. Nurses must be willing to represent the nursing profession's perspective, as well as the patient's perspective in the community. Nurses can be powerful and effective when the organizing focus is the protection and welfare of the public entrusted to their care.

❖ KEY CONCEPTS

- With increased emphasis on patient rights, nurses in practice today must understand their legal obligations and responsibilities to patients.
- The civil law system is concerned with the protection of a person's private rights, and the criminal law system deals with the rights of individuals and society.
- A nurse can be found liable for negligence if the following criteria are established: the nurse (defendant) owed a duty of care to the patient (plaintiff), the nurse did not carry out that duty, the patient was injured, and the nurse's failure to carry out the duty caused the patient's injury.
- Patients are entitled to confidential health care and freedom from unauthorized release of information.
- Under the law, practising nurses must follow standards of care, which originate in nursing practice acts and regulations, the guidelines of professional organizations, and the written policies and procedures of employing institutions.
- Nurses are responsible for confirming that the patient has given informed consent to any surgery or other medical procedure before the procedure is performed.
- Nurses are responsible for performing all procedures correctly and exercising professional judgement as they carry out physicians' orders.
- Nurses are obligated to follow physicians' orders unless they believe the orders are in error or could be detrimental to patients.
- Staffing standards determine the ratio of nurses to patients, and if the nurse is required to care for more patients than is reasonable, a formal protest should be made to the nursing administration.
- Legal issues involving death include documenting all events surrounding the death and treating the deceased patient's remains with dignity.
- A competent adult can legally give consent to donate specific organs, and nurses may serve as witnesses to this decision.
- All nurses should know the laws that apply to their area of practice.
- Depending on provincial statutes, nurses are required to report suspected child abuse and certain communicable diseases.
- Nurses are patient advocates and ensure quality of care through risk management and lobbying for safe nursing practice standards.
- Nurses must file incident reports in all situations when someone could or did get hurt.

❖ CRITICAL THINKING EXERCISES

1. Nurse Rossi and Nurse Kao are getting on an elevator to go down to the cafeteria. Several visitors are present in the elevator, as are hospital personnel. Nurse Rossi and Nurse Kao are talking about a patient who is in the intensive care unit who has just tested positive for HIV infection. They identify the patient as "the man in Room 14B." One of the visitors on the elevator who overhears this information is a woman who is engaged to the patient in Room 14B.
 - a. Have Nurse Rossi and Nurse Kao breached a patient's right to confidential health care?
 - b. Would the patient in Room 14B have any legal cause of action against the nurses?
 - c. Even though the patient's fiancée may have a right to know the HIV status of her future husband, do the nurses have any duty to disclose confidential information to the fiancée?

2. While transporting a patient down the hall on a stretcher, Nurse Reyes stops to chat with an orderly. The side rails on the stretcher are down, and while Nurse Reyes has her back to the stretcher, the patient rolls over, falls off the stretcher, and fractures his hip. In a lawsuit by the patient against Nurse Reyes, what must the patient establish to prove negligence against the nurse?

✦ REVIEW QUESTIONS

- The nursing practice acts are an example of
 - Statute law
 - Common law
 - Public law
 - Criminal law
- Treating a patient without his or her consent is considered
 - Battery
 - Negligence
 - Implied consent
 - Expressed consent
- The nurse restrains a patient without the patient's permission and without a physician's order. The nurse may be guilty of
 - Assault
 - False imprisonment
 - Invasion of privacy
 - Neglect
- The situation in which a confused patient fell out of bed because side rails were not used when they were ordered is an example of which type of liability?
 - False imprisonment
 - Assault
 - Battery
 - Negligence
- What should you do if you think the patient does not understand the procedure for which he or she is being asked to give consent?
 - Do not be concerned if the consent is already signed.
 - Notify the physician or nursing supervisor.
 - Send the patient for the procedure and discuss it afterward.
 - Ask a family member to give consent.
- When a patient is harmed as a result of a nursing student's actions or lack of action, the liability is generally held by
 - The student
 - The student's instructor or preceptor
 - The hospital or health care facility
 - All of the above
- When the nurse stops to help in an emergency at the scene of an accident, if the injured party files suit and the nurse's employing institution's insurance does not cover the nurse, the nurse would probably be covered by
 - The nurse's automobile insurance
 - The nurse's homeowner's insurance
 - The Patient Care Partnership, which may grant immunity from suit if the injured party consents
 - The Good Samaritan laws, which grant immunity from suit if no gross negligence is involved

- The nurse is obligated to follow a physician's order unless
 - The order is a verbal order
 - The physician's order is illegible
 - The order has not been transcribed
 - The order is in error, violates hospital policy, or would be detrimental to the patient
- If a third party (e.g., insurance company of employer) requests health information on a patient, the nurse must
 - Provide the information
 - Refuse to provide the information
 - Obtain a signed release by the patient before releasing the information
 - Contact the patient's family or lawyer
- When is it acceptable for a nurse to post information about a patient on a social networking site?
 - If the patient's name is not provided
 - If the posting is done anonymously
 - If the site has privacy controls
 - It is inappropriate to post patient information online

✦ RECOMMENDED WEB SITES

Canadian Nurses Association—Provincial/Territorial Members: http://www.cnaaicc.ca/CNA/about/members/provincial/default_e.aspx

This CNA site offers up-to-date Weblinks and contact information for all provincial and territorial nursing colleges and associations.

The Canadian Nurses Protective Society: <http://www.cnps.ca>
The Canadian Nurses Protective Society (CNPS) helps nurses manage their professional legal risks by offering legal support and liability protection. The members-only section of the Web site (the user name is the acronym of your professional association or college, and the password is "assist") provides information on a variety of legal topics affecting Canadian nursing practice.

Department of Justice Canada: <http://laws.justice.gc.ca/en/>
This site provides links to consolidated statutes, including the *Criminal Code* (1985) of Canada.

The Health Law Institute of Dalhousie University: The End of Life Project: http://as01.ucis.dal.ca/dhli/cmp_welcome/default.cfm

This site contains information about the Canadian law pertaining to various aspects of end-of-life care, including advance directives and withholding of life-sustaining treatment.

Review Question Answers

1. 1, 2, 1, 3, 2, 4, 4, 5, 2, 6, 4, 7, 4, 8, 4, 9, 3, 10, 4

Rationales for the Review Questions appear at the end of the book.

Global Health, Culture, and Diversity

Written by Barbara J. Astle, RN, PhD, Sylvia S. Barton, RN, PhD, Leanne Johnson, RN, MN, and Judy Mill, RN, PhD

objectives

Mastery of content in this chapter will enable you to

- Describe the key terms listed.
- Differentiate between global health, international health, and public health in the context of professional nursing.
- Describe the concepts of global citizenship and the professional roles of nursing in a global world.
- Describe the diversity of the Canadian population.
- Define key cultural concepts related to health, illness, and diversity.
- Describe the historical development of the concept of culture, cultural competence, and cultural safety in relation to nursing practice.
- Analyze components of cultural assessment to understand the values, beliefs, and practices critical in the nursing care of people experiencing cultural transitions.
- Apply selected components of cultural assessment to particular cultural groups and populations.
- Examine nursing responsibilities that underpin relational practice and the way in which relational inquiry can enhance professional nursing practice.
- Apply research findings to the provision of culturally competent care with considerations for cultural safety and relational practice.
- Apply cultural assessment components to the Aboriginal peoples of Canada.

media resources

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<http://evolve.elsevier.com/Canada/Potter/fundamentals/>

- Audio Chapter Summaries
- Examination Review Questions
- Glossary
- Student Learning Activities
- Weblinks

key terms

Acculturation, p. 111	Global health, p. 108
Assimilation, p. 111	Health equity, p. 108
Cultural assessment guide, p. 116	Indigenous peoples, p. 110
Cultural awareness, p. 113	Invisible culture, p. 110
Cultural imposition, p. 111	International health, p. 108
Cultural pluralism, p. 111	Multiculturalism, p. 111
Cultural relativism, p. 111	Pre-European contact, p. 119
Cultural safety, p. 113	Post-European contact, p. 120
Cultural sensitivity, p. 113	Public health, p. 108
Culturally competent care, p. 112	Race, p. 110
Culturally congruent care, p. 112	Racism, p. 111
Culture, p. 110	Relational practice, p. 123
Discrimination, p. 111	Stereotypes, p. 111
Enculturation, p. 111	Subcultures, p. 110
Ethnicity, p. 110	Transcultural assessment model, p. 112
Ethnocentrism, p. 111	Transcultural nursing, p. 112
European contact, p. 119	Visible culture, p. 110
Global citizen, p. 108	
Global citizenship, p. 108	

Global Health

As we progress into the twenty-first century, it is increasingly apparent that nurses have a key role to play in examining global health challenges, developing solutions, and implementing change. As Austin (2004), a nurse ethicist, reminds us, "In this area of globalization, our moral space is changing and we need to develop an openness, an attentiveness to persons and other living things outside our immediate geographical community" (p. 352). Nursing's responsibility for global health is consistent with our history in advocating for social justice and is critical to ensure that global health inequities are minimized or eliminated. In order to contribute to global health, nurses need to understand key concepts related to global health, global citizenship, health equity, cultural safety, and diversity.

Global health refers to “the optimal well-being of all humans from the individual and collective perspective...” (Canadian Nurses Association [CNA], 2009, p. 1). According to Koplan and colleagues (2009), global health encompasses prevention, treatment, and care, while focusing on the improvement of health for all and health equity. These authors argue that in addition to transnational health issues, global health is concerned with domestic health disparities. In addition they suggest that “the *global* in global health refers to the scope of problems, not their location” (p. 1994). For instance, poverty in inner-city neighbourhoods, limited access to health care in rural communities, and high rates of malaria in sub-Saharan African children are all examples of global health issues. In order to achieve global health, interdisciplinary collaboration and authentic partnerships between high-income and low-and/or middle-income countries (LMIC) are required to develop effective solutions for complex health issues (Koplan et al., 2009). Benatar (2005) argues that moral imagination, or the ability to imagine what it is like to be in another person’s situation, is necessary to make progress toward global health.

Koplan and colleagues (2009) suggest that global health overlaps with concepts derived from the disciplines of **public health** and **international health**. Each of these domains shares several common characteristics: a population-based and preventative focus, work with marginalized populations, a focus on multidisciplinary and interdisciplinary approaches, acknowledgement that health is a public good, an emphasis on systems and structures, and participation with key stakeholders. Table 9-1 compares the similarities and differences of each of the three domains.

Health Equity

Health equity is a concept that is fundamental to understanding and achieving global health. Health inequalities or health disparities refer to differences in health status among different population groups (Health Disparities Task Group, 2004). *Health inequities*, on the other hand, refer to “differences in health that are not only unnecessary and avoidable but, in addition, are considered unfair and unjust” (Whitehead, 1992,

p. 430). Braveman and Gruskin (2003) suggest that **health equity** refers to the “absence of systematic disparities in health (and its key social determinants) that are systematically associated with social advantage/disadvantage” (p. 256). Health inequity puts disadvantaged groups at further disadvantage, and poverty is often the root cause. The inability of all persons living with HIV in sub-Saharan Africa to access care and treatment is an example of a health equity issue.

Braveman and colleagues (2011) caution that health inequity implies a judgement about the causality of differences and suggest that measuring health inequities relies on quantifying health disparities. The term *health equity* is a normative concept that reflects the value of social justice (Braveman et al., 2011; Reutter & Kushner, 2010). Thus, health equity is a critical and necessary element to achieve health for all, because of the underlying value that health is a human right and the implicit goal to eliminate differences in health is unfair.

Reutter and Kushner (2010) argue that nursing has a strong and clear mandate to reduce health inequities among individuals, families, and communities, as well as to take action on the social conditions that contribute to health inequities. These authors suggest that nursing must provide sensitive, empowering care to individuals experiencing health inequities and, at the same time, participate in policy analysis and advocacy to reduce inequities.

Global Citizenship

Global citizenship is a concept that has been discussed for many years and has been advocated by a variety of disciplines, including law, community health, education, epidemiology, and nursing. Mill and colleagues (2010) argue that global citizenship is a critical role and responsibility for professional nurses. **Global citizenship** refers to our responsibilities as citizens to not only engage in our local, national, and international community, but to act upon social injustices and inequities (Oxfam, 1997). A **global citizen** incorporates not only an *inward* personal awareness and commitment to global issues, but also *outward* actions on local or global issues (Hanson, 2010). Byers (2005) suggests that “global citizenship empowers individuals

► **TABLE 9-1** Comparison of Global, International, and Public Health

	Global Health	International Health	Public Health
Geographical Reach	Focuses on issues that directly or indirectly affect health but that can transcend national boundaries	Focuses on health issues of countries other than one’s own, especially those of low- and middle-income countries	Focuses on issues that affect the health of the population of a particular community or country
Level of cooperation	Development and implementation of solutions often requires global cooperation	Development and implementation of solutions often requires bi-national cooperation	Development and implementation of solutions does not usually require global cooperation
Individuals or populations	Embraces both prevention in populations or clinical care of individuals	Embraces both prevention in populations or clinical care of individuals	Mainly focuses on prevention programs for populations
Access to health	Health equity among nations and for all people is a major objective	Seeks to help people of other nations	Health equity within a nation or community is a major objective
Range of disciplines	Highly interdisciplinary and multidisciplinary within and beyond health sciences	Embraces a few disciplines but has not emphasized multidisciplinary	Encourages multidisciplinary approaches, particularly within health sciences and with social sciences

Source: Koplan, J. P., Bond, T. C., Merson, M. H., Reddy, K. S., Rodriguez, M. H., Sewankambo, N. K., Wasserheit, J. N. (2009). Towards a common definition of global health. *The Lancet*, 373, 1994.

to participate in the decisions concerning their lives, including the political, economic, social, cultural and environmental conditions in which they live" (p. 37). The common thread in global citizenship is our *interconnectedness*, and the acknowledgement that the local and global are connected, with one perspective not privileged over the other (Mill et al., 2010). According to Oxfam (1997), the characteristics of a global citizen include but are not limited to awareness of the wider world; respecting and valuing diversity; understanding the economic, political, social, cultural, technological, and environmental influences; contributing to the community at a local and global level; striving toward sustainability in the world; taking responsibility for our own actions; and acting on social injustice. Nurses have an extensive history of working with the marginalized in society and in advocating for social justice (CNA, 2010b). The roots of social responsibility in nursing have been traced to pioneers such as Florence Nightingale, Margaret Sanger, Lavinia Dock, and Lillian Wald (Coss, 1989; Duncan et al., 1999; Kelley et al., 2008; Smith, 2000).

Cultural Diversity

Canada has always been a multicultural nation. At the time of Confederation, more than 50 Aboriginal groups—each with its own language and culture—lived in Canada, in addition to the founding British and French settlers and other settlers migrating primarily from European countries. Canada is well known as a country that embraces diversity, relying heavily on immigration for population growth (Adams, 2007). As a result, the societal landscape changes continuously, integrating people from many ethnic groups who have migrated to this country and formed a cultural mosaic that is uniquely Canadian (Statistics Canada, 2007a, 2008b).

The ethnocultural profile of Canada is continually evolving. More than 200 ethnic origins were reported by the total population in Canada in the 2011 census. After Canadian, the other most frequently reported origins in 2006, either alone or with other origins, were English, French, Scottish, Irish, German, Italian, Chinese, North American Indian, and Ukrainian. According to the 2006 census, visible minorities accounted for 16.2% of Canada's total population, up from 13.4% in 2001 and 11.2% in 1996 (Statistics Canada, 2008b; Figure 9-1). Between 2001 and 2006, the visible minority population increased at a much faster rate than did the total population (Statistics Canada, 2008b). For the purposes of the 2011 census, the *Employment Equity Act* defines visible minorities as persons, other than Aboriginal peoples, who are non-Caucasian in race or nonwhite in colour (Statistics Canada, 2008b). The increase in the visible minority population was largely attributable to the high proportion of newcomers who belonged to visible minorities.

Figure 9-2 shows the most common visible minority groups in Canada. The three largest visible minority groups are South Asians, Chinese, and Blacks. South Asians surpassed Chinese as the largest visible minority group in 2006 (Statistics Canada, 2008b). Both the populations of South Asians and Chinese were well over 1 million. In Canada in 2006, South Asians represented 24.9% of all visible minorities and 4.0% of the total population, Chinese accounted for about 24.0% of the visible minority population and 3.9% of the total population, and Blacks accounted for 15.5% of the visible minority population and 2.5% of the total population (Statistics Canada, 2008b).

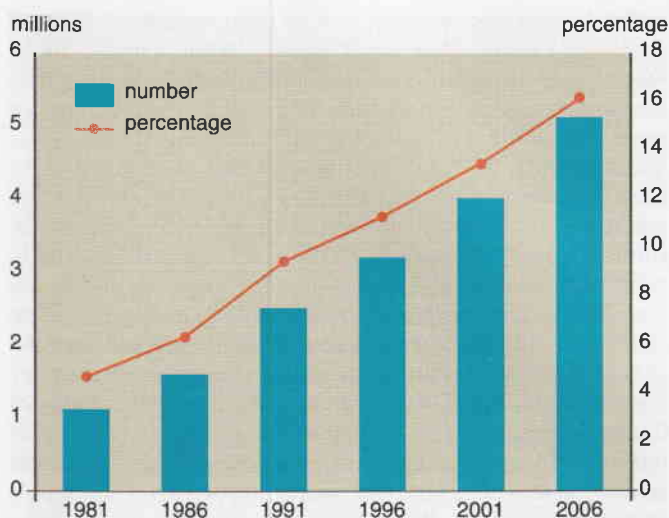


Figure 9-1 Number and share of visible minority persons in Canada, 1981–2008. **Source:** Adapted from Statistics Canada. (2008). *Canada's ethnocultural mosaic, 2006 census*. Retrieved from <http://www12.statcan.ca/english/census06/analysis/ethnorigin/index.cfm>.

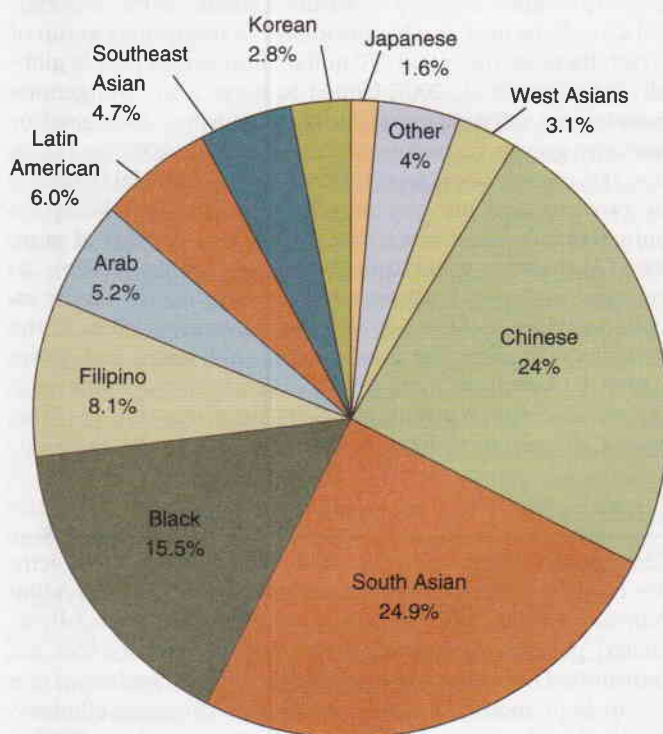


Figure 9-2 The composition of Canada's visible minority population, 2006. **Source:** Adapted from Statistics Canada (2008). *Canada's ethnocultural mosaic, 2006 census*. Retrieved from <http://www12.statcan.ca/english/census06/analysis/ethnorigin/index.cfm>.

Immigration continues to play a pivotal role in shaping Canada's ethnocultural profile (Statistics Canada, 2007a). According to the 2006 census, approximately 19.8% (one per five) of Canada's total population were born outside of the country, reaching the highest level in 75 years (Statistics Canada, 2007a). For the purposes of the 2006 census, a *foreign-born population* is also known as an *immigrant population* and is

defined as persons who are, or who have been, landed immigrants in Canada (Statistics Canada, 2007a). Canada ranks second only to Australia as the country with the highest proportion of foreign-born citizens. In addition, Canada receives more immigrants per capita than does the United States (Statistics Canada, 2007a). The largest groups of immigrants to Canada are from Asian and Middle Eastern countries; this fact has remained virtually unchanged since the 2001 census. In contrast, during 1971, only 12.1% of immigrants to Canada were born in Asian and Middle Eastern countries, and 61.6% were born in Europe. By 2006, 58.3% of recent immigrants were Asian and only 16.1% were European. Immigration has now outpaced the natural birth rate of the country, as revealed by Statistics Canada (2007a) between 2001 and 2006. Statistics Canada reports that Canada's foreign-born population increased by 13.3%, which was four times higher than the increase in the Canadian-born population of 3.3%. Thus, immigrants and refugees come to Canada from many places, representing more than 200 ethnocultural groups across the country (Statistics Canada, 2007a).

Two other significant aspects of Canada's cultural mosaic are the Aboriginal population and the population of French ancestry. In the 2006 census, more than 2 million people, representing 3.8% of the total population, reported having at least some Aboriginal ancestry (Statistics Canada, 2008a). Aboriginal Canadians may also be considered an Indigenous group of which there are more than 370 million indigenous people globally (Nettleton et al., 2007; United Nations, 2008). **Indigenous peoples** are referred to as "indigenous, tribal, aboriginal or minority groups or peoples" (Stephens et al., 2005, p. 11). In the 2006 census, population by knowledge of official language by province and territory revealed that citizens who spoke only French totalled more than 4 million, of a total of more than 31 million Canadians (Statistics Canada, 2007b). In response to Canada's ethnocultural mosaic, nurses require an understanding of difference in order to perceive, critically, the diversity influences that shape healing, well-being, and caring patterns (Racher & Annis, 2012). Historically, a nurse who pioneered a more transcultural view of nursing was Lyle Morrison Creelman (Box 9-1).

Understanding Cultural Concepts

Clarification of key concepts related to culture and ethnicity are crucial to understanding their complexity. The Canadian Nurses Association (CNA, 2010a) describes **culture** broadly as shared patterns of learned values and behaviours that are transmitted over time and that distinguish the members of one group from another. Culture can include language, ethnicity, spiritual and religious beliefs, socioeconomic class, gender, sexual orientation, age, group history, geographic origin, and education, as well as childhood and life experiences. According to the CNA's (2008a, 2008b) *Code of Ethics*, "When providing care, nurses do not discriminate on the basis of a person's race, ethnicity, culture, political and spiritual beliefs, social or marital status, gender, sexual orientation, age, health status, place of origin, lifestyle, mental or physical ability or socioeconomic status or any other attribute" (p. 14).

Culture has both **visible** (easily seen) and **invisible** (less observable) components. The invisible value and belief system of a particular culture is the major driving force behind visible practices. Although a Sikh man may be easily identified by visible symbols (uncut hair with wooden comb, beard, turban,

BOX 9-1

Milestones in Canadian Nursing History

Lyle Morrison Creelman, 1908-2007

Born in Upper Stewiack, Nova Scotia, Lyle Morrison Creelman, arguably Canada's foremost international nurse, was a visionary and collaborative leader whose career exemplifies the exciting possibilities of the nurse/scholar to lead change. She passionately articulated the importance of nursing's contribution to global health, as she fought to introduce improved nursing standards and a more modern vision of community-based public health nursing worldwide.

A 1936 graduate of the University of British Columbia in public health nursing and recipient of a Rockefeller Foundation fellowship to Teachers College, Columbia University, in 1939, she was appointed director of nursing in 1941 of a groundbreaking internationally funded project to integrate all public health services in greater Vancouver communities. She launched her international career with the United Nations Relief and Rehabilitation Administration in 1944. As chief nurse of the British Occupied Zone of Germany, she orchestrated nursing services for millions of displaced persons awaiting repatriation or resettlement. After her return home in 1947, Creelman co-authored with Dr. J.H. Baillie a landmark study that set new directions for public health practice in Canada for years to come. In 1949, she joined the World Health Organization (WHO) and subsequently served as the organization's chief nursing officer (CNO) from 1954 to 1968.

Primary health care, social justice and caring remained core values underpinning her philosophy of nursing. As CNO, Creelman pioneered a more transcultural view of international nursing that valued culturally sensitive, sustainable, and affordable nursing services. Rather than imposing Western models from the top down, she stressed that nursing services, education, and research must be developed at the grassroots level and tailored to the local socioeconomic context. To achieve these goals, she was an early proponent of shifting from expensive, curative medical approaches to practices that emphasize disease prevention and health promotion as a global strategy. Lyle Creelman spent her career helping nurses communicate more effectively and engage in community and global partnerships to gain a directing voice in the struggle for a more equitable distribution of health care resources nationally and globally. Her voice still resonates today in the 1978 Declaration of Alma-Ata and the 2003 Florence Nightingale Initiative for Global Health.

Source: Dr. Susan Armstrong Reid, May 2011.

steel bracelet, and steel dagger), for example, the meanings and beliefs associated with these artifacts are not readily apparent. These artifacts symbolize a devotee's allegiance to the pillars of Sikhism, and removal of them without expressed consent of the individual or his family may be considered sacrilegious, violating the ethnoreligious identity of the person.

In Canada, the prevalent cultures are anglophones and francophones with origins from Western Europe. **Subcultures** such as the Ukrainian and Acadian cultures represent various ethnic, religious, and other groups with distinct characteristics. **Ethnicity** refers to groups whose members share a social and cultural heritage. Members of ethnic groups, for example, may share common values, language, history, physical characteristics, and geographical space. The most important characteristic of an ethnic group is that its members feel a sense of common identity. People may declare their ethnic identity, for instance, as Scottish, Vietnamese, or Colombian. A term that is usually contrasted with ethnicity is **race**, which is limited to the

common biological attributes shared by a group, such as skin colour (Spector, 2012).

Cultural pluralism is a perspective that “promotes respect for the right of others to have different beliefs, values, behaviours, and ways of life” (Racher & Annis, 2012, p. 159). **Cultural relativism** “fosters awareness and appreciation of cultural differences, rejects assumptions of superiority of one’s culture and adverts ethnocentrism” (Racher & Annis, 2012, p. 159). In any intercultural encounter, nurses “are challenged to be open and responsive to cultural differences, while respecting, protecting, and promoting the rights and well-being of those people and groups with whom they work” (Racher & Annis, 2012, p. 160). As nurses, for example, we need to be aware that Canada is a major immigrant-receiving country: preliminary numbers reveal that 280,636 new permanent residents immigrated to Canada from 169 countries in 2010 (Citizenship and Immigration Canada, 2011). As Ogilvie (2011) suggests, such diversity requires nurses to seek out knowledge on what cultural competence is, what cultural safety is, and what the connection is between the two. Community health nurses, for example, may need to be knowledgeable about parenting in newcomer families in order to develop a portrait of the health and well-being of these families (Wilkinson et al., 2010).

The processes of enculturation and acculturation facilitate cultural learning. Socialization into one’s primary culture during childhood is known as **enculturation**. The process of adapting to and adopting characteristics of a new culture is **acculturation** (Cowan & Norman, 2006). Acculturation outcomes may result in varying degrees of affiliation with the mainstream culture (Spector, 2012). **Assimilation** is a process whereby a minority group gradually adopts the attitudes and customs of the mainstream culture (Srivastava, 2007a). In relation to acculturation, the notion of integration may be viewed as an example of an adaptive process of acculturation.

In contrast to assimilation, **multiculturalism**, regarded as a fundamental characteristic of Canadian society, is a process whereby “many cultures co-exist in society and maintain their cultural differences. Multiculturalism also refers to the public policy of managing cultural diversity in a multi-ethnic society, emphasizing tolerance and respect for cultural diversity” (Srivastava, 2007b, p. 328). In 1971, Canada became the first country in the world to officially adopt a multiculturalism policy. Since then, various laws have been passed to protect and promote the rights of minorities in Canada (Box 9-2). As expressed in the spirit of the multicultural policy, citizens are able to retain their unique ethnocultural traditions within a Canadian context.

Cultural Conflicts

Culture provides the context for valuing, evaluating, and categorizing life experiences. As values, morals, and norms are transmitted from one generation to another, members of ethnic groups may display **ethnocentrism**, a tendency to view their own way of life as more valuable than others’. Health care practitioners who do not understand cultural differences often resort to **cultural imposition**, in which they use their own values and ways of life as the absolute guides in providing services to patients and interpreting their behaviours. Hence, if a nurse believes that pain is to be borne quietly as a demonstration of strong moral character, that nurse may be annoyed by a patient’s insistence on being given pain medication and, in denying the patient’s discomfort, may exacerbate the patient’s pain.

BOX 9-2

Legislation Recognizing Diversity in Canada

Official Languages Act (1969; Updated 1988)

This Act recognizes English and French equally as Canada’s official languages. The 1988 amendment to this Act outlines the obligations of Canadian federal institutions to be committed to promoting full recognition and use of both English and French in Canadian society, as well as supporting the development of the anglophone and francophone communities across the country.

Canadian Constitution Act (1982)

This Act replaced the *British North America Act* as Canada’s Constitution, outlining how Canada governs and structures its society. It also recognizes the Aboriginal peoples of Canada as Indians (Status and Non-Status), Inuit, and Métis.

Canadian Charter of Rights and Freedoms (1982)

Written into the *Canadian Constitution* in 1982, this charter is a statement of the basic human rights and freedoms of all Canadians.

Canadian Multiculturalism Act (1988)

In recognition of Canada’s cultural diversity, this Act enshrines the enhancement and preservation of multiculturalism in Canada.

Ethnocentrism is the root of stereotypes, biases, and prejudices against other people perceived to be different from the valued group. You need to avoid **stereotypes**, which are generalizations about any particular group that prevent further assessment of unique characteristics. When a person acts on his or her prejudices, **discrimination**—treating people unfairly on the basis of their group membership—occurs. **Racism** involves specific actions and an attitude whereby one group exerts power over others on the basis of either skin colour or racial heritage; its effects are to marginalize and oppress some people and to endow others with privileges (Srivastava, 2007a). Often, people do not realize that they are displaying prejudice or discrimination; such displays may be simply negative or fearful reactions to cultural differences (see Chapter 10 for a description of Ethel Johns’s work on racism).

Historical Development of the Concept of Culture

It is important to review historically the emergence of trans-cultural nursing in relation to shifts in thinking about the provision of culturally competent care and cultural safety. Framed primarily within the Canadian context, this history is also best discussed in terms of culturally appropriate nursing practice and education. The importance of being culturally sensitive and aware of a diverse society has been acknowledged by nurses and continues to evolve. Nurses became aware of the conceptual limitations of culture, partly by studying the complexities of race (Ramsden, 2002). Through a critical cultural analysis of the significance of power relations and structural constraints on health and health care, nurses are conceptualizing new ways to provide culturally competent and culturally safe care (Anderson et al., 2003; Baker, 2007; Browne & Varcoe, 2006; Brown et al., 2009; Gustafson, 2007; Racine, 2009; Ramsden, 2002; Smith et al., 2006). A critical

historical view of transcultural nursing, cultural competence, and cultural safety is important for understanding the strengths and limitations of these approaches in nursing practice and education (Gustafson, 2005). Increasingly, nurse scholars are questioning whether the health needs of ethnic cultural groups are being equitably met (Anderson et al., 2003; Baker, 2007; Smith et al., 2006). Equity may be considered one of the prerequisites and conditions for health. Mill and colleagues (2005) revealed how “nurses can provide valuable support to the realization of the goal of global health by becoming informed advocates and integrating these concepts, in nursing practice, education and research” (p. 22). Furthermore, in a second article (Ogilvie et al., 2005), the same scholars explained how “nurses can play a pivotal role by becoming informed advocates, challenging their organizations to incorporate a global health mandate and exercising their rights as citizens to influence policy” (p. 25).

The discipline of anthropology and seminal work by Leininger (2002b) relative to cultural nursing have both highly influenced the establishment of a theoretical foundation of transcultural nursing (Glittenberg, 2004). Leininger defined **transcultural nursing** as a comparative study of cultures, an understanding of similarities (culture universal) and differences (culture specific) across human groups in order to provide meaningful and beneficial delivery of health care (Leininger, 2002b). According to Leininger, the goals of transcultural nursing are to provide *culturally congruent* and *culturally competent care*.

Culturally congruent care is “the use of sensitive, creative, and meaningful care practices to fit with the general values, beliefs, and lifeways of clients” (Leininger & McFarland, 2002, p. 12). In other words, you need to determine how to provide care that does not conflict with patients’ valued life patterns and sets of meanings, which may be distinct from your own (Leininger, 2002a).

Leininger and McFarland (2002) defined **culturally competent care** as “the explicit use of culturally based care and health knowledge in sensitive, creative, and meaningful ways to fit the general lifeways and needs of individuals or groups for beneficial and meaningful health and well-being or to help them face illness, disabilities, or death” (p. 84). To provide culturally competent care, you must bridge cultural gaps in care, work with cultural differences, and enable patients and families to receive meaningful care. You need to exhibit specific ability, knowledge, sensitivity, openness, and flexibility toward the appreciation of cultural difference (Suh, 2004). You are then able to develop effective and meaningful interventions that promote optimal health for patients, families, and communities.

The work of Leininger in promoting culturally competent care with people from diverse cultures has been the prevailing model identified in the nursing literature. It has been used as a guide in nursing curricula and practice policies in North America for several decades. In addition, other scholars have developed models of cultural competency in which they have expanded Leininger’s work. Davidhizar and Giger (1998; also Giger, 2013) developed a **transcultural assessment model** with a focus on cultural competency that is used in nursing practice. The underlying premise of their model is that each person is culturally unique and should be assessed according to six cultural phenomena: communication, space, social organization, time, environmental control, and biological variations. The model suggests that these phenomena are apparent in all

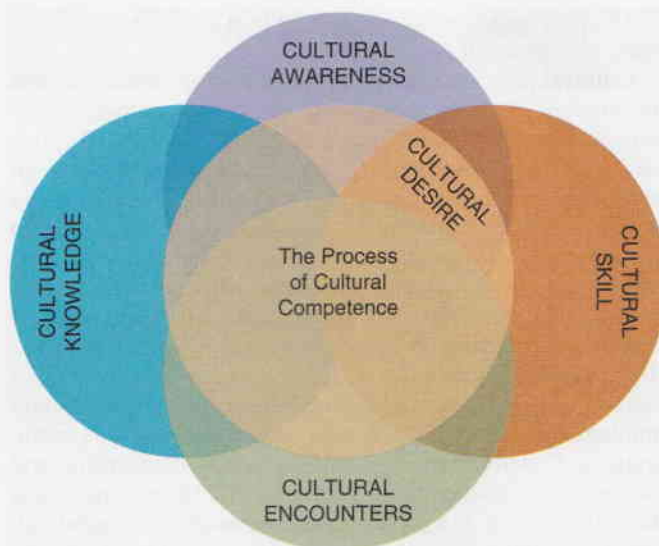


Figure 9-3 The process of cultural competence. **Source:** Campinha-Bacote, J. (2002). The process of cultural competence in the delivery of health-care services: A model of care. *Journal of Transcultural Nursing*, 13(3), 181. Printed with permission from Transcultural CARE Associates, Cincinnati, OH.

cultural groups, but their application to practice settings varies. Giger and Davidhizar’s transcultural assessment model offers a means for you to assess patients’ unique health care needs, including their specific cultural health practices.

Campinha-Bacote (2002) further defined cultural competence as an ongoing process, whereby you continuously strive to work within the patient’s cultural context. As a result, you develop cultural competence rather than possess it. This ongoing process involves integrating cultural awareness, knowledge, skill, encounters, and desire, as depicted in Figure 9-3. *Cultural awareness* is insight into one’s own background, and it involves an in-depth self-examination to recognize biases, prejudices, and assumptions about other people. *Cultural knowledge* is knowing about the patient’s culture. It involves learning about diverse groups, including their values, health beliefs, care practices, and world views. As a nurse assigned to a female Egyptian-Canadian patient, for example, you decide to seek information about the Egyptian culture. Upon learning that female modesty and gender-congruent care are valued in the culture, you encourage the patient’s female relatives to assist with her hygiene needs. *Cultural skills* include assessment of social, cultural, and biophysical factors that influence patient care. *Cultural encounters* involve engaging in cross-cultural interactions that can teach about other cultures. *Cultural desire* is the motivation and commitment to learn from other people, to accept the role as learner, to be accepting of cultural differences, and to build relationships based on cultural similarities.

Narayanasamy (2002), a nurse scholar in Britain, also developed a framework for cultural competence: the ACCESS model (A for assessment; C for communication; C for cultural negotiation and compromise; E for establishing respect and rapport; S for sensitivity; and S for safety). The focus of this model is on developing cross-cultural communication, cultural negotiations, diversity, and celebrations, and on fostering cultural safety (Narayanasamy & White, 2005).

In Canada, the CNA (2010a) advocates in its position statement that culturally competent care can and should be practised in all clinical settings. The “underlying values for cultural competence are inclusivity, respect, valuing differences, equity and commitment” (Registered Nurses’ Association of Ontario, 2007, p. 19). Cultural competence is viewed as a key concept in the application of knowledge, skill, attitudes, and personal attributes by nurses in the provision of appropriate care and services in relation to the cultural characteristics of patients. A nurse practising in this way, for instance, would hold the belief of valuing diversity, be interested in and seek out knowledge as appropriate about cultural mores and traditions from diverse patients being served, and be sensitive to these while caring for the cultural diverse person. Although nurses are responsible for providing culturally competent care, nursing regulatory bodies, professional associations, educational institutions, governments, health service agencies, and accreditation organizations share the responsibility of supporting culturally competent care. You are in a position to build partnerships with other health care providers, patients, and funding agencies in order to establish culturally diverse practices that optimize patients’ health outcomes.

The provision of culturally competent care has been promoted since the 1960s. Only since 2000, however, have Canadian nurse scholars begun to question the limitations of such an approach (Anderson et al., 2003; Kirkham, 2003) and to examine, critically, the concept of **cultural safety** as another approach to providing care to diverse groups, in contrast to the conceptual notion of transcultural nursing (Ramsden, 2002). The College of Registered Nurses of British Columbia’s (2006) profile of newly graduated registered nurse practice focuses on the therapeutic caring and culturally safe relationships between patients and health care team members. The cultural safety literature is framed within a critical social theory and postcolonial framework. The concept of cultural safety evolved over a number of years in New Zealand, as nurses tried to identify a way in which health care providers could more effectively address the inequity in the health status of Maori people. This was combined with an analysis of the historical, political, social, and economic situations influencing the health of Maori people (Ramsden, 2002). Cultural safety involves considering the redistribution of power and resources in a relationship. The notion “is based on the premise that the term ‘culture’ is used in its broadest sense to apply to any person or group of people who may differ from the nurse/midwife because of socio-economic status, age, gender, sexual orientation, ethnic origin, migrant/refugee status, religious belief or disability” (Ramsden, 2002, Chapter 8, p. 3). In contrast to transcultural nursing, the term *culture* refers to ethnicity. As a result, the philosophy of cultural care has shifted from a notion of cultural sensitivity underpinning the provisions of care irrespective of culture to one of cultural safety with the recognition of power imbalances, the understanding of the nature of interpersonal relationships, and the awareness of institutional discrimination (Baker, 2007; Browne & Fiske, 2001; Brown et al., 2009; CNA, 2010a; Racine, 2009) (Box 9-3). Thus, understanding and providing culturally competent and safe care have the potential to make a difference to the health of many culturally diverse groups, especially Canada’s Aboriginal population of First Nations, Inuit, and Métis peoples.

Ramsden (2002) articulated that *cultural awareness* and *cultural sensitivity* are separate concepts and that those terms are not interchangeable with *cultural safety*. Achieving cultural

BOX 9-3 RESEARCH HIGHLIGHT

Globalization and the Cultural Safety of an Immigrant Muslim Community

Research Focus

The social health of Muslims who reside in smaller areas of Canada is not clearly understood by health care providers. The concept of cultural safety has been used in studies of both Aboriginal peoples and immigrants to understand the health of Aboriginal peoples and immigrants in a large metropolitan centre, but the dichotomy between culturally safe and unsafe groups was found to be blurred. To further understand the concept of cultural safety, Baker (2007) focused on the social health of a small immigrant community of Muslims in a relatively homogeneous region of Canada after the terrorist attacks in the United States on September 11, 2001 (“9/11”).

Research Abstract

Many Muslims living in North America and Western Europe were negatively affected by the events of 9/11. A qualitative approach based on the constructivist paradigm was used to guide the study, and 26 in-depth interviews were conducted with Muslims (10 women and 16 men) of Middle Eastern, Pakistani, or Indian origin. The participants resided in the province of New Brunswick, Canada, between 2002 and 2003. Data collection and analysis were conducted simultaneously. Steps of unitizing, categorizing, and pattern seeking were used to dissect the interviews until saturation was obtained. Many participants reported that after 9/11, their Islamic faith and experiences of being Muslim suddenly became significant to society at large. The research findings revealed that these participants talked about a sudden transition from cultural safety to cultural risk after 9/11. Their positive experiences of cultural safety included invisibility as a minority and a sense of social integration in the community. Cultural risk was found to stem from intensive international media attention that highlighted their now-visible minority status.

Evidence-Informed Practice

In this study, the findings indicated that globalization does not necessarily blur the distinction between culturally safe and culturally unsafe groups. Cultural risk may be generated by outside forces rather than by long-term inequities in relationships between groups within the community, which did not necessarily originate in historical events. Such findings suggest that you need to think about cultural safety in Muslims within the context of globalization. In addition, you should be cognizant about the cultural safety of your practice when providing care to members of socially disadvantaged cultural groups and how this may influence the health care received.

Reference: Baker, C. (2007). Globalization and the cultural safety of an immigrant Muslim community. *Journal of Advanced Nursing*, 57, 296–305.



safety is a step-wise progression from cultural awareness through cultural sensitivity to cultural safety (Figure 9-4). The outcome of cultural safety is that safe care, defined as such by patients who receive the care, is provided. According to Ramsden (2002), **cultural sensitivity** “alerts students to the legitimacy of difference and begins a process of self-exploration as the powerful bearers of their own life experience and realities which can have an impact on others” (Ramsden, 2002, Chapter 8, p. 4). **Cultural awareness** “is a beginning step toward understanding that there is difference. Many people undergo courses designed to sensitize them to formal ritual



Figure 9-4 Steps toward achieving cultural safety in nursing practice. **Source:** Adapted from Ramsden, I. M. (2002). *Cultural safety and nursing education in Aotearoa and TeWaipounamu* (unpublished PhD thesis). Wellington, New Zealand: Victoria University of Wellington. Retrieved from <http://culturalsafety.massey.ac.nz>.

and practice rather than the emotional, social, economic and political context in which people exist" (Ramsden, 2002, Chapter 8, p. 4). A strategy for achieving cultural awareness is to conduct a self-assessment in order to reflect on your biases and feelings. A set of questions for personal reflection is suggested for this purpose in Box 9-4. Another strategy is to observe nurses who are considered to be exemplary relational practitioners and to notice the particular qualities or characteristics they display when handling the cultural aspects of relationships (Box 9-5).

With regard to achieving cultural safety in nursing practice, Ramsden stated that "the skill for nurses does not lie in knowing the customs or even the health related beliefs of ethno-specific groups. The step before that lies in professional acquisition of trust. Rather than the nurse determining what is culturally safe, it is consumers or patients who decide whether they feel safe with the care that has been given, that trust has been established, and that difference between the patient, the nurse and the institutions that underpin them, can then be identified and negotiated" (Ramsden, 2002, Chapter 8, p. 4), as depicted in Figure 9-4.

Cultural Assessment

A comprehensive cultural assessment is the basis for providing culturally competent care. A cultural assessment, combined with critical thinking skills, provides the knowledge necessary for transcultural nursing care (Andrews & Boyle, 2012). Cultural assessment is a systematic and comprehensive examination of the cultural care values, beliefs, and practices of individuals, families, and communities. The goal of cultural assessment is to generate from the patients themselves significant information that enables culturally congruent care (Leininger & McFarland, 2002). Several models of cultural

► BOX 9-4 Questions for Reflection and Building Awareness in Nursing

Personal Self-Awareness

What is my ethnic background? How does my knowledge of my ethnicity affect my identity? What meaning do I ascribe to my ethnic origins? How have they shaped who I am today? What cultural groups do I belong to? What are the rules, customs, and rituals that have been passed on to me and that I will pass on to the next generation of my family? How were these passed on to me, and what meaning do I give to them now? How do the rules and customs passed on to me inform how I engage with others?

Professional Self-Awareness

In my work, how do I relate to others of different cultures? What taken-for-granted assumptions am I prepared to make in the name of efficiency and time constraints? What stereotypes do I hold? How do these beliefs influence my practice? How do I maintain an attitude of cultural attunement in my work with groups and organizations? How do I bridge the differences between ethnic backgrounds in my work? What action might I take to improve my cultural attunement?

Organizational Awareness

What are the values and principles of my organization for working cross-culturally? How does my organization reflect behaviours, attitudes, policies, and structures when working cross-culturally? How does my organization value diversity, manage the dynamics of difference, acquire and institutionalize cultural knowledge, and adapt to diversity and the cultural contexts of the communities it serves?

Community Awareness

How do the dynamics of the community, such as racial tensions, enter into my work with community groups and organizations? When does difference make a difference? How does this community influence feelings of belonging among its residents? What actions do we take to be inclusive? How do we celebrate and honour cultural diversity? What do we need to do differently to be more inclusive and generate feelings of belonging among residents from all cultures?

Sources: Adapted from Hoskins, M. L. (1999). Worlds apart and lives together: Developing cultural attunement. *Child and Youth Care Forum*, 28(2), 73–85; Kirkham, S. (2003). The politics of belonging and intercultural health care. *Western Journal of Nursing Research*, 25(7), 762–780; Goode, T. (2004). *Cultural competence continuum*. Washington, DC: National Center for Cultural Competence. Retrieved from <http://www11.georgetown.edu/research/gucchd/nccc/projects/sides/dvd/continuum.pdf>; and Racher, F.E., & Annis, R.C. (12). Honouring culture and diversity in community practice. In A. R. Vollman, E. T. Anderson, & J. McFarlane (Eds.), *Canadian community as partner: Theory & multidisciplinary practice* (3rd ed., p. 172). Philadelphia, PA: Lippincott Williams & Wilkins.

assessment exist, each involving different levels of skill and knowledge. Leininger's Sunrise Model (Leininger & McFarland, 2002), depicted in Figure 9-5, demonstrates the inclusiveness of culture in everyday life and helps explain why cultural assessment must be comprehensive. According to the Sunrise Model, cultural care values, beliefs, and practices are embedded in the cultural and social structural dimensions of society, which include environmental contexts, language, and ethnohistory (i.e., significant historical experiences of a particular group). For older adults, for example, the experience of the Great Depression has sometimes resulted in a tendency to be frugal. You must encourage patients to share stories

► BOX 9-5 An Exemplary Relational Practitioner

1. *Identify* someone whom you would say is “good at relationships.” Why did you identify that person? What qualities or characteristics stand out?
2. Now *identify* someone who is a nurse and is good at relationships. Think of someone with whom you have worked—perhaps a fellow student, a colleague, an instructor. What makes this person good at relationships? How is this person perceived by his or her colleagues?
3. *Compare notes* with someone else. Talk to someone who has thought about this question, or talk to someone who knows the person or people you have identified. Do you both value similar attributes and qualities?

Source: Doane, G. H., & Varcoe, C. (2005). *Family nursing as relational inquiry: Developing health-promoting practice* (p. 192). Philadelphia, PA: Lippincott Williams & Wilkins.

about their lives that reveal how they think and the cultural lifestyle they embrace. Leininger’s model differentiates folk care, which is caring as defined by the people, from the health care professions, which is based on the scientific, biomedical system of care.

Whichever assessment model is used, you begin cultural assessment by knowing population demographic changes in the practice setting. You anticipate the patient populations that use their own methods of care and gain some knowledge about their cultures before they come to the clinical setting. Background knowledge about a culture assists you in conducting a focused assessment when time is limited. Demographic information can be gathered from the local and regional census data, as well as from the patients themselves. Demographic information might include the distribution of ethnic groups, education, occupations, and incidence of the most common illnesses. Comprehensive cultural assessment requires skill

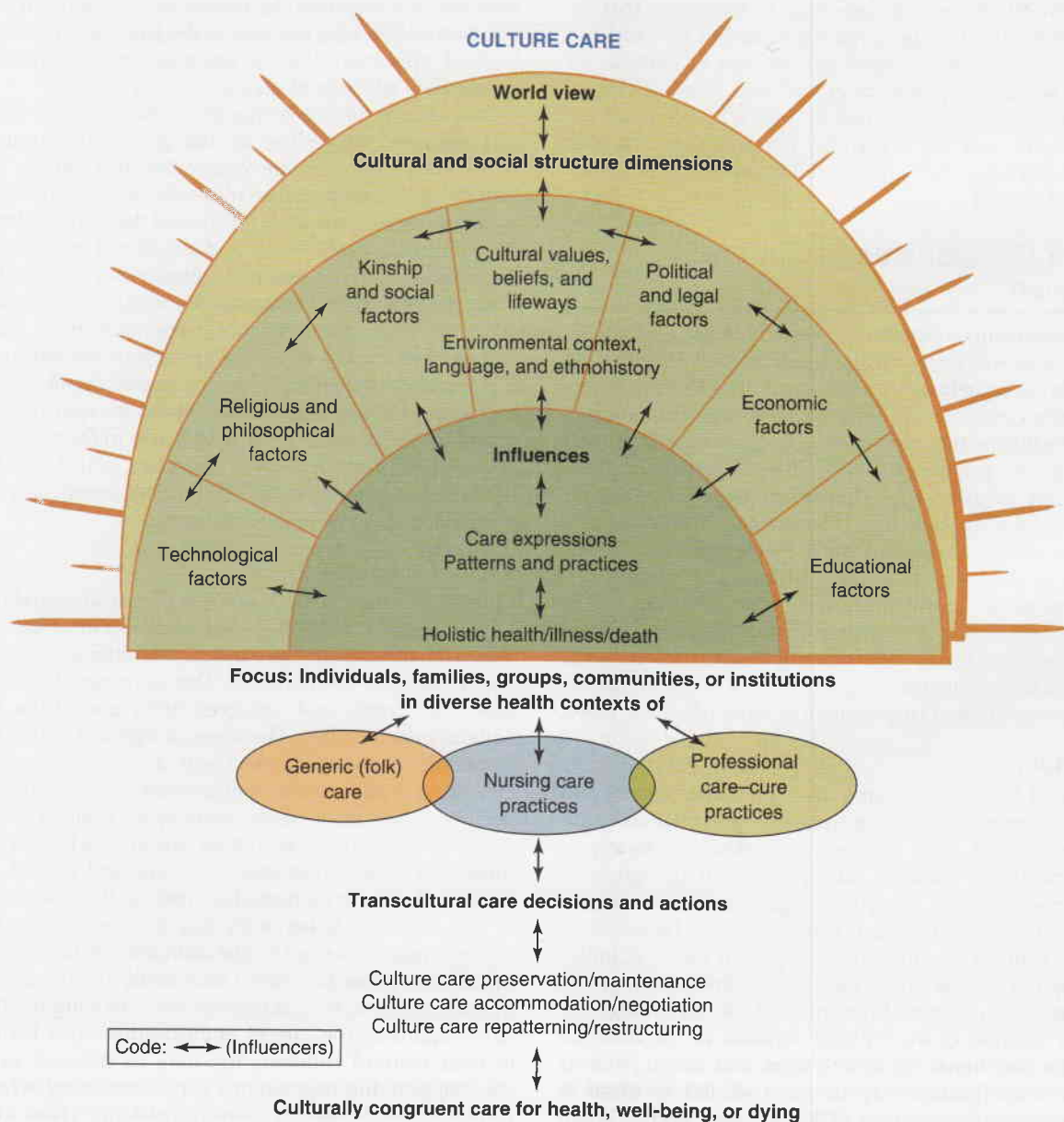


Figure 9-5 Leininger’s culture care theory and Sunrise Model. **Source:** Leininger, M. M., & McFarland, M. R. (2002). *Transcultural nursing: Concepts, theories, research and practice* (3rd ed., p. 80). New York: McGraw-Hill.

and time; hence, preparation and anticipation of needs are important.

A challenge in cultural assessment is the lack of ability to assess multiple perspectives of patients and to interpret the information elicited. It helps to use open-ended questions (e.g., "What do you think caused your illness?"), focused questions (e.g., "Have you had this problem before?"), and contrast questions (e.g., "How different is this problem from the one you had previously?"). The aim is to encourage patients to describe values, beliefs, and practices that are significant to their care, which may be taken for granted unless otherwise revealed. Culturally oriented questions are by nature broad and require a lot of description. Table 9-2 provides a list of guiding questions (a **cultural assessment guide**) that focuses on social and cultural dimensions of assessment.

According to some health care providers, the idea of a specific cultural assessment model or tool further marginalizes those from particular cultures by placing emphasis on the difficulties with difference. It is important to remember that the many questions used in the cultural assessment tool and culturally sensitive communication tool are just as suitable for Canadians within the dominant group, such as white Anglo-Saxons. The question to be raised is this: Why not just have one assessment tool for everyone? For instance, everyone might be asked what their preference for touch is or how they like to be addressed.

Selected Components of Cultural Assessment

Cultural assessment is important in the total care of any patient. Over time, you will learn various skills needed to gather an accurate and comprehensive assessment. The following sections describe certain components of cultural assessment that provide information that can be useful in planning and providing nursing care. You may use the following information as a starting point to assess the similarities and differences of patients and families. However, it is better not to assume that because any two patients come from the same region or country, they share similar values, beliefs, attitudes, and experiences. Other elements to consider are the social determinants of health: early childhood development, education, employment and working conditions, food security, health care services, housing shortages, income, social safety nets, social exclusion, and unemployment and employment security (Raphael, 2008).

Ethnohistory

Knowledge of a patient's country of origin and its history and ecological contexts is significant to health care. Haitian immigrants, for example, have linguistic and communication patterns distinct from those of Jamaicans, even though both groups come from the Caribbean region and may have a common history of oppression. Differences can be traced to their colonial history and intermingling with the local indigenous people. Cultural characteristics of Hindu immigrants from Jamaica are different from those of Hindu immigrants from India because of the cultural contexts of the different regions. The nutritional, communication, and health patterns of Hindus from Jamaica may be more similar to those of African Jamaicans than to those of South Asian Hindus. When caring for a Hindu patient of Indian descent who grew up in Jamaica, you may expect that he or she will interact more like a Jamaican, although he or she may look South Indian.

You should be aware that people immigrate to another country for various reasons and have different motivations for doing so. Refugees may be relocated without having chosen their new location, in contrast to immigrants who are able to choose where they live. Refugees tend to experience greater dislocation and deprivation than do immigrants who enter Canada with specialized skills and education and who have the option to return to their homeland. Age at immigration may determine the level of acculturation: younger immigrants acculturate faster than do their older counterparts. Similarities shared by an immigrant group with the prevailing culture in society are strong predictors of how easily the members of that group adjust. Although acculturation and length of residence in the new country are related, outcomes may be affected by other factors, such as education, racial characteristics, and familiarity with language and religion. You may ask patients about the circumstances that brought them to Canada and how they believe they are adjusting. You need to understand, for instance, any problems the patient may have (such as becoming comfortable with routines or the language used to arrange medical appointments), in order to make reasonable and appropriate adjustments to care.

You should also be aware that newly arrived immigrants and refugees, depending on the geographic location from which they originate, are vulnerable to a variety of health conditions, including tuberculosis, hepatitis B, anemia, dental caries, intestinal parasites, nutritional deficiencies, incomplete immunization, and mental and emotional concerns such as depression and post-traumatic stress disorder (Kemp, 2004). New immigrants and refugees also frequently experience language barriers, social isolation, separation from family, loss and grief, and a lack of information about available resources. It is important that you explore the historical and sociopolitical background of a patient with regard to the specific immigrant community; this knowledge assists you in formulating a plan of care (Lo & Pottinger, 2007). Therefore, you should be aware of, and advocate for, primary health care programs in the community for these vulnerable patients.

Social Organization

Cultural groups consist of units of organization delineated by kinship, status hierarchy, and appropriate roles for their members. Nurses need to consider all options when determining a patient's next of kin. This is especially relevant to new immigrants and refugees, who may have relocated without intact families. The status of a patient within the social hierarchy is generally linked with qualities such as age and gender, as well as with achievements such as education and position. The mainstream culture in Canada emphasizes achievement as the determinant of status, whereas other cultures may give higher priority to age and gender. In many Asian and African cultures, for instance, the eldest son is next in line after his father with regard to authority. A Korean mother may be subject to the authority of her oldest son in the absence of her husband. Older adults occupy higher status in some societies, so that grandparents may impose their decisions regarding the care of grandchildren over the decisions of their married children. You may be required to facilitate and support the negotiations for determining who has the responsibility for family decision making. Think of a nurse you have observed who acted as negotiator, advocator, and facilitator in a situation in which family roles needed to be clarified.

► **TABLE 9-2 Cultural Assessment Guide**

Subject	Suggested Questions	Subject	Suggested Questions
Cultural identity/ ancestry/heritage Ethnohistory	Where were you born? Where were your parents born? How long have you or your parents resided in this country? What is your ethnic background or ancestry? How strongly are you influenced by your culture? Why did you leave your homeland?	Language and communication	What language(s) do you speak at home? What language(s) are you most comfortable speaking? In what language(s) can you read and write? How do you want us to talk to you? How should we address you, or what should we call you? What kinds of communication upset or offend you? What words would you use to describe how you feel? Do you need an interpreter? Would you prefer a female or male interpreter?
Social organization	Who lives with you? Whom do you consider members of your family? Where do you live? Where do other members of your family live? How do you contact them? How often do you have contact with your family members? Who makes the decisions for you or your family? Whom do you go to outside of your family for support? What do you expect your family members to do for you? How different are your expectations of them now from your expectations at other times? What expectations do you have of your family members who are male, female, old, or young?	Religion/spirituality	What is your religion? Who is your religious or spiritual leader? Do you want to be in touch with your religious leader? How do we contact your spiritual leader? What are some of the things we need to do within your religion? How do you practise your religion? Do you follow specific dietary practices? What do you do to keep yourself well? What do you do to show someone you care?
Socioeconomic status	What do you do for a living? What did you do back in your homeland? Where did you go to school? What level did you finish in school? How different is your life here from your life back in your homeland? Do you have a primary health care provider? What other health care providers have you seen?	Caring beliefs and practices	How does your family or you take care of sick family members? Which caregivers do you seek when you are sick? How do you decide when to go to a caregiver and which one to go to? How different is what we do from what your family does for you when you are sick?
Biocultural ecology and health risks	What is your purpose for coming here? What caused your problem? Have you had this problem before? Does this problem affect your life and your family? How? Do other members of your family have this kind of problem? How do you treat this problem at home? Whom do you go to for this kind of problem? What other plans do you have for dealing with this problem? What do you think we should do for you? What other problems do you have? Have these problems occurred with any other member of your family?	Experience with professional health care	Are we doing what you think we should be doing for you? How should we give you care? Since you came to this country, have you had contact with doctors or hospitals? How do you compare your past health care experience with those of the present? What were some of the problems that you encountered? How were they resolved? What were the positive experiences you had? What type of health care provider do you prefer? Why? If you have a choice, what changes do you wish to see?

Role expectations of family members may be defined by culture and differentiated by gender. Devout female Muslims, for example, tend to be caregivers, and male Muslims tend to be providers and major decision makers. Some Muslim women may insist on staying at the bedside of an unwell child, in-laws,

or husband, but the assumption that she can be relied on to make decisions independently as the primary caregiver may be unrealistic. The social hierarchy of the family needs to be determined as soon as possible, in order to avoid offending patients and their families.

Socioeconomic Status, Biocultural Ecology, and Health Risks

The identification of health risks related to sociocultural and biological history can be assessed on admission of patients. Distinct health risks can be attributed to the ecological context of the culture. Immigrants from the region near the Nile River, for example, are generally predisposed to parasitic infestations endemic to that region. Immigrants from developing countries with poor sanitary conditions and water supply may have infections such as hepatitis that they can pass on to others. In addition, biological variations exist between people from different ethnic groups. As a result, some groups have greater risk of developing certain health conditions. Some genetic disorders, for example, are linked with specific groups, such as Tay-Sachs disease among Ashkenazi Jews and malignant hypertension among Black Canadians.

Language and Communication

Distinct linguistic and communication patterns are associated with different cultural groups. These patterns reflect the core cultural values of a society. In Western cultures that uphold individualism, assertive communication is valued because it demonstrates autonomy and self-determination. People are expected to say what they mean and to mean what they say. In collectivistic cultures, communication is shaped by the context of relationships among participants. Group harmony is the priority, so that participants interact on the basis of their expected positions and relationships within the social hierarchy. People are more likely to remain respectful and show deference to older adults or family leaders, even though they may disagree on an issue. Among Asian cultures, for example, face-saving communication promotes harmony by indirect, ambiguous communication and by conflict avoidance. Messages spoken may have little to do with their meanings. Saying no to a superior or older person may not be permitted; hence, an affirmative response of a subordinate may mean only “I heard you,” rather than full agreement.

In cultural groups with distinct linear hierarchy, conflict is negotiated between people with the same level of position or authority. Identifying and working with family members of an established hierarchy may prevent miscommunication. In cultures with highly differentiated gender roles, some patients may place more value on the advice of a male nurse than on that of a female nurse. By recognizing and working within a particular cultural context, the nurse can become more effective in achieving appropriate outcomes.

Nonverbal communication is also shaped by culture. Culture influences the distance between participants in an interaction, the extent of touching, the degree of eye contact, and how much private information the patient shares. Patients use less distance when speaking to trusted affiliates and persons of the same gender, age, and social position. Members of many ethnic groups tend to speak their own dialect with each other in order to feel ease and to secure privacy. To minimize the distance when communicating with patients, you need to consider taking up a relational approach to cultural nursing that greatly enhances the ability to know and respond to people (Hartrick Doane & Varcoe, 2005). A relational approach to nursing allows you not only to connect across differences but also to recognize cultural similarities and differences more intently. Such an approach provides opportunities “to attend to issues of meaning, experience, race, history, culture, health, and sociopolitical systems. In addition, as we

relationally honour and attend to such differences the potential for growth, change, and knowledge development is enhanced” (Hartrick Doane & Varcoe, 2005, p. 9).

Religion and Spirituality

Religious and spiritual beliefs have major influences on the person’s attitudes toward health and illness, pain and suffering, and life and death. The distinction between religion and spirituality is often blurred. It is advisable for you to understand the various perspectives of patients. Many cultures do not separate religion and spirituality, whereas many others have totally distinct concepts of the two. To an Anglo-Canadian, for example, spirituality may mean an inner, personal relationship with a higher being. Although a discussion of religious and spiritual philosophies is difficult in a hospital setting, you need to assess what is important to the spiritual well-being of patients and learn as much as possible about their spiritual and religious practices (see Chapter 27).

Caring Beliefs and Practices

Caring beliefs and practices incorporate a patient’s perception of his or her ability to control circumstances or factors in the environment. Specifically, it may refer to a patient’s perception of how he or she can influence causes of illness and use cultural healing modalities and healers. During cultural assessment, you should identify the health practices of the patient and respect them (Box 9-6). Obtain information about folk remedies used and cultural healers employed by the patient. Unless these practices are harmful, they should be incorporated into the patient’s plan of care.

BOX 9-6 NURSING STORY

Identifying the Patient’s Health Care Practices

A Chinese immigrant who recently arrived in Canada has given birth to her first child. Once the newborn has been cared for and is resting, you ask the new mother if she would like to take a shower. The mother refuses politely. Her belief is that if she takes a shower, she could contract rheumatism in old age. Then the mother’s food tray arrives, and she does not touch or eat anything. For this newcomer to Canada, the hospital food may seem different and served in an unfamiliar manner. Her family brings plain rice and salted pork into the hospital. They also bring two different soups, which are thought to bring heat, the “yang,” into her body, thereby removing the impurities from her system.

In traditional Chinese culture, good health means achieving a balance between yin and yang. The belief is that all body systems interact with each other and with the environment to produce a balanced state of wellness. In consultation with the mother, you are able to assess and understand why she is refusing to shower and eat the hospital food. With this increased understanding, you are able to mutually negotiate with the mother some alternatives for her care to accommodate her needs, without jeopardizing her care or causing her distress. You appropriately assess that rather than showering, the mother would prefer a basin of water and a cloth that she could use to clean herself. With regard to her dietary requests, you determined that she can eat the food from home as long as it does not interfere with or jeopardize her health status. As a result, your sensitivity and respect for the new mother’s cultural beliefs enable her to relax and recover in a culturally safe environment. You were open to learning about the cultural beliefs of the new mother and then collaborating with her on decisions about care.

Experience With Professional Health Care

All cultures have concepts of past, present, and future dimensions of time. An aspect of a patient's experience with professional health care, for instance, may be your understanding of the patient's orientation of time. This information can be useful in planning care, arranging appointments for procedures, and helping a patient plan self-care activities at home. Differences exist in the concepts of time that cultures emphasize and in how time is expressed. Communication concerning time may be indirect and circular in order to avoid offending and disrespecting other people.

Present time orientation, for instance, may conflict with the policies of a health care institution that emphasizes punctuality and adherence to appointments. Improving patients' access to health services may be achieved by mutually negotiating schedules and by accommodating cultural patterns.

Application of Cultural Assessment Components to Aboriginal Peoples of Canada

Aboriginal peoples represent an important and growing group within Canada. In 2006, the number of people who identified themselves as Aboriginal (i.e., North American Indian [First Nations], Métis, and Inuit) surpassed 1 million (Statistics Canada, 2008a). Since the mid-1990s, the Aboriginal population has increased significantly. Between 1996 and 2006, it grew by 45%, nearly six times faster than the 8% rate of increase for the non-Aboriginal population (Statistics Canada, 2008a). In 2006, Aboriginal peoples accounted for almost 4% of the total population of Canada (Statistics Canada, 2008a). Of the three Aboriginal groups in Canada, the Métis population increased the most. Aboriginal peoples in Canada also increasingly live in urban centres. In 2006, 54% lived in urban areas (including large cities or census metropolitan areas and smaller urban centres); this proportion increased from 50% in 1996 (Statistics Canada, 2008a). Furthermore, the Aboriginal population is, on average, younger than the non-Aboriginal population. Almost half (48%) of the Aboriginal population consists of children and youth aged 24 and younger, in comparison with 31% of the non-Aboriginal population (Statistics Canada, 2008a).

The three Aboriginal groups—First Nations, Métis, and Inuit—have their own unique languages, heritages, cultural practices, and spiritual beliefs (Indian and Northern Affairs Canada, 2010). These groups contain many subgroups, each with its own unique culture. The term *Indian* describes all the Aboriginal peoples in Canada who are not Métis or Inuit. These include the nations or groups of people who were originally living in Canada before the European explorers began to arrive in the 1600s. Three legal definitions are used to describe Indians in Canada: Status, Non-Status, and Treaty Indians. Status Indians are registered under the *Indian Act* (Indian and Northern Affairs Canada, 2011), which regulates the management of reserves and sets out certain federal obligations. Non-Status Indians are not registered under the *Indian Act* (Indian and Northern Affairs Canada, 2011). A *Treaty Indian* is a Status Indian who belongs to a First Nation that signed a treaty with the Crown (Indian and Northern Affairs Canada, 2011).

Many Aboriginal people find the term *Indian* offensive and outdated; in the 1970s, the term *First Nation* became preferred to *Treaty Indians*. In addition, many Indian people adopted the term *First Nation* to replace the word *band* and also appended

the term *First Nation* to the name of their community, such as the *Nuxalk First Nation* (Indian and Northern Affairs Canada, 2011; Wasekeesikaw, 2010). Some Aboriginal people prefer the more inclusive term *First Peoples* rather than the word *Nation* because in English, *Nation* does not fit with the Aboriginal social structure. The first European explorers to arrive in North America used the term *Indian* because they thought they had reached India (Wasekeesikaw, 2010). First Nations peoples claim that the roots of the term *Indian* reflect a history of colonialism and that the term is, therefore, inappropriate (Wasekeesikaw, 2010).

What we refer to as “colonialism” is actually a theoretical framework for understanding the complexities of the relationship that evolved between Aboriginal peoples and Europeans as they came into contact and later sustained those initial relationships in building a new reality for both peoples in North America. Specifically, colonialism is the development of institutions and policies by European imperial and Euroamerican settler governments toward Aboriginal peoples (Alfred, 2009, p. 45).

The following sections describe variations from non-Aboriginal culture that exist among Canadian Aboriginal peoples. Bear in mind that these discussions are general in nature, and each patient needs to be assessed individually, as evidence demonstrates that many Aboriginal people and communities are healthy despite a history of colonization. Gerald Alfred's statement reflects the importance of being aware of this history and embracing a healing journey:

Yet informed opinion on the matter is clear, as the most recent compendium of top-level medical and social science research on mental health issues in Indigenous populations confirms that it is not indigenous dysfunction that is the root problem, but the dispossession of Indigenous people from the land and their subsequent oppressive treatment on reserves in the Indian Act system and in residential schools, and through other government policies. (Alfred, 2009, p. 47)

Ethnohistory

An understanding of specific cultural Aboriginal groups in Canada is important in order to appreciate contemporary health issues affecting Aboriginal peoples. The First Nations of Canada are exceptionally diverse, culturally, linguistically, socially, economically, historically, and in other ways. As Waldram et al. (2006) emphasized, “The recognition and acceptance of such diversity is essential to an appreciation of developments in the health care field and to an appreciation of the myriad processes that have affected the health status of Aboriginal people in both the pre-contact and post-contact periods” (p. 23).

Pre-European contact refers to the history of Aboriginal people before exploration and settlement of the Americas by Europeans. During that period, Aboriginal people were composed of distinct cultures from the Arctic, Western Subarctic, Eastern Subarctic, Northeastern Woodlands, Plains, Plateau, and Northwest Coast. Traditional health beliefs, shamans, herbalists, and folk medicine were aspects of how Aboriginal communities experienced healing and well-being. **European contact** began on Canada's east coast, where French explorers and fur traders settled and introduced diseases such as smallpox, tuberculosis, and measles, which killed thousands of Aboriginal people. Scarce resources diminished Aboriginal livelihoods, and malnutrition, starvation, and alcohol consumption made circumstances worse (Dickason, 2006). During

post-European contact, Europeans established relationships with Aboriginal people, and colonization influenced Aboriginal systems of government, trade, and health care. Over the years, the Canadian government displaced Aboriginal people from their traditional lands and developed policies to isolate them and assimilate them into Canadian society, which resulted in the destruction of Aboriginal cultures. These oppressive and suppressive policies, and the acts that followed, had extensive negative effects on Aboriginal cultural identities and governance (Wasekeesikaw, 2010). The Indian residential school system, for instance, which no longer exists in Canada, left a multi-generational legacy of physical and psychological abuse that “lives on in the form of significant pain and suffering among residential school survivors and their families” (Barton et al., 2005b, p. 295).

Social Organization

Many First Nations peoples live on reserves and in communities in each of the Canadian provinces and territories, and many Inuit live in settlements throughout the territories. The reserves are easily accessible in the southern regions but remote and isolated in the northern regions. Métis live in communities across Canada and in settlements set aside for them in Alberta. For many Aboriginal people, the biological family is the traditional centre of social organization and includes all members of the extended family. The principles that guide family and community social organization by which they live their lives include the notion of wholeness, whereby “all things are interrelated, and everything in the universe is part of a signal whole. Everything is connected in some way to everything else, and it is only possible to understand something if one understands how it is connected to everything else” (Hunter et al., 2004, p. 274).

Socioeconomic Status

Cultural disorganization resulting from colonization underpins the culture of poverty, circumstances that are experienced by many Aboriginal people in contemporary Canadian society. Large proportions of the Aboriginal population live in remote communities (Statistics Canada, 2008a) and travel back and forth between rural and urban environments. In general, the Aboriginal population experiences both poorer health and reduced access to health services in comparison with most Canadians living in rural and urban locations. Along with other inequities and social injustices that contribute to their vulnerability, they are socially, economically, and politically marginalized from mainstream society. “Thus, there is a complex interplay between geographical context and the historical socio-economic and political context of Aboriginal people’s health, and it has profoundly influenced the health and social status of Aboriginal Canadians” (Tarlier et al., 2007, p. 129).

Biocultural Ecology and Health Risks

Since the 1950s, dramatic changes in lifestyle have affected the social, environmental, and health status of Aboriginal people (Waldram et al., 2006). The disease patterns in many First Nations and Inuit communities continue to resemble those found in low-income countries, despite improvements since the 1990s (Health Canada, 2011b). First Nations people and Inuit experience serious health-related challenges related to high rates of chronic and contagious diseases and shorter life expectancy (Health Canada, 2011b). In addition, the prevalence of major chronic diseases, including diabetes, cardiovascular

disease (1.5. times higher), cancer, arthritis, and rheumatism, appears to be increasing in this population (Gracey & King, 2009; Health Canada, 2011b; King et al., 2009; Vollman et al., 2012). Rates of unintentional injuries, deaths from drowning, and other accidents are also high among children and families in Aboriginal communities (Vollman et al., 2012).

Tuberculosis. Although the overall incidence of tuberculosis has dropped steadily since the 1960s, the incidence among First Nations and Inuit people is eight to ten times higher than the national rate (Health Canada, 2011b). Factors contributing to such a high rate include overcrowding and unsafe or unreliable water supplies in these communities.

Diabetes Mellitus. Viewed as an epidemic in progress for Canadian Aboriginal peoples, diabetes has a prevalence (dependent on location) that is three to five times higher in this population compared to non-Aboriginal Canadians (Health Canada, 2011a). Contributing factors associated with this rate are based on research that involves an integrated understanding of genetic susceptibility, changes associated with transitioning from a physically active lifestyle to a sedentary lifestyle, and the consumption of a high sugar, fats, and salt diet. Type 2 diabetes is diagnosed with increasing frequency in Aboriginal children (Health Canada, 2011a). Earlier onset of the disease leads to an earlier onset of complications, as well as excessive mortality rates among young and middle-aged adults. In Inuit communities, the rate of diabetes is still relatively low, but concerns have been raised that this may change if the Inuit alter their traditional eating patterns and lifestyle (Health Canada, 2011a). In July, 2010, the Government of Canada announced through a news release that it would continue to support the Aboriginal Diabetes Initiative (ADI), in order to address the high rates of diabetes among Aboriginal peoples living on-reserve, as well as off-reserve. Background information from Health Canada states:

“Established in 1999, the Aboriginal Diabetes Initiative (ADI) had initial funding of \$58 million over five years. It was then expanded in 2005 with a budget of \$190 million over five years. Budget 2010 included a commitment of \$110 million over two years for the ADI. The ADI’s main objective is to reduce type 2 diabetes by supporting health promotion and disease prevention activities and services, delivered by trained community diabetes workers and health service providers. Renewed funding will enable First Nations and Inuit communities to continue to build on past successes in more than 600 communities throughout Canada. The ADI delivers a range of primary prevention, screening and treatment programs in partnership with Tribal Councils, First Nations organizations, Inuit community groups and Provincial and Territorial governments. Through these activities, the ADI supports prevention, health promotion, screening and care management initiatives that are community-based and culturally appropriate. The renewed ADI will feature several areas of enhanced focus, including:

- Initiatives for children, youth, parents and families;
- Diabetes in pre-pregnancy and pregnancy;
- Community-led food security plans to improve access to healthy foods, including traditional foods; and,
- Enhanced training for home and community care nurses on clinical practice guidelines and chronic disease management strategies.

Using local knowledge, First Nations and Inuit communities are encouraged to develop innovative, culturally relevant approaches aimed at increasing community wellness and ultimately reducing the burden of type 2 diabetes. Community

activities funded through the ADI vary from one community to another, and may include walking clubs, weight-loss groups, diabetes workshops, fitness classes, community kitchens, community gardens and healthy school food policies. The ADI also supports traditional activities such as traditional food harvesting and preparation, canoeing, drumming, dancing and traditional games. The ADI supports a network of over 300 trained community diabetes prevention workers via active training programs and the sharing of best practice models and approaches" (http://www.hc-sc.gc.ca/ahc-asc/media/nr-cp/_2010/2010_129bk-eng.php).

HIV and AIDS. Human immunodeficiency virus (HIV) infections and cases of acquired immune deficiency syndrome (AIDS) among Canadian Aboriginals have increased steadily since the 1990s, whereas the annual number of AIDS cases has levelled off in the rest of the population. Aboriginal peoples are overrepresented among HIV and AIDS cases in Canada; although Aboriginal persons make up about 3.8% of the Canadian population, it is estimated that they represent about 8.0 % of all those living with HIV and AIDS (Public Health Agency of Canada [PHAC], 2010). In addition, the HIV infection rate is about 3.6 times higher among Aboriginal persons than non-Aboriginal persons. Between 1996 and 2006, Aboriginal persons with HIV and AIDS differed significantly from non-Aboriginal persons. Compared to their non-Aboriginal counterparts, Aboriginal persons who are diagnosed with HIV were more likely to be younger (32.4 % versus 21% under age 30), female (48.1% versus 20.7%), and infected through intravenous drug use (53% versus 14%) (PHAC, 2010).

Alcohol and Substance Abuse. It is difficult to collect accurate data, but the abuse of alcohol and other substances is perceived to be common in some Aboriginal communities (Health Canada, 2011d). Alcohol and substance abuse can be viewed as part of a set of complex issues affecting the social and physical well-being of the patient, the family, and the community. The National Native Alcohol and Drug Abuse Program was established to assist First Nations and Inuit community members in instituting and operating programs aimed at reducing the level of alcohol, drug, and solvent abuse among target groups on reserves. The program emphasizes prevention and treatment, as well as training, research, and development.

Suicide. The suicide rates in Inuit and First Nations communities are five to six times higher than the rates found in the non-Aboriginal population (Health Canada, 2012b). Although there is much variation among communities, suicide rates are five to seven times higher for First Nations youth than for non-Aboriginal youth; suicide rates among Inuit youth are eleven times the national average, among the highest in the world (Health Canada, 2012b). Possible factors contributing to the suicide rate include psychobiological factors (pre-existing mental illness, personality disorders, dysfunctional cognitive style), situational life history factors (early childhood trauma, family dysfunction, substance abuse, conflict with authority, absence of spirituality), socioeconomic factors (poverty, unemployment), and cultural stress (low self-esteem, lack of cultural heritage) (Waldram et al., 2006).

Aboriginal Women and Violence. According to the 2009 General Social Survey (GSS), approximately 67,000 Aboriginal women aged 15 or older across the provinces self-reported they had experienced one or more crimes of a violent nature, such as sexual assault, robbery, and physical assault, in the 12 months prior to the survey. This rate is almost three times higher than the rate reported by non-Aboriginal women

* BOX 9-7 RESEARCH HIGHLIGHT

Intergenerational Trauma: Convergence of Multiple Processes Among First Nations Peoples in Canada



Traumatic events exact an enormous psychological and physical toll on survivors and often have ramifications that must be endured for decades. This includes emotional scars, and in many cases standards of living are diminished, often never recovering to levels that existed prior to the trauma. These traumas can occur at a personal level (e.g., car accident, rape) or at a collective level (war, natural disaster, genocide), and the responses to such events are not identical. In the latter instance, there is now considerable evidence that the effects of trauma experiences are often transmitted across generations, affecting the children and grandchildren of those who were initially victimized. The present review is meant to describe the immediate and intergenerational impacts of traumatic events in First Nations people. In this regard, particular attention is devoted to how intergenerational effects may come about, with particular focus on the influence of socioeconomic disadvantages (e.g., living conditions) and parental styles that might be secondary to traumatic events. Importantly, however, collective trauma may have profound intergenerational effects that infiltrate beyond easily observed or measured factors that come from the survivors telling and retelling of trauma (or in contrast, by the deep silence that is common among some survivors) (Bombay et al., 2009, p. 6).

Reference: Bombay, A., Matheson, K., & Anisman, H. (2009).

Intergenerational trauma: convergence of multiple processes among First Nations peoples in Canada. *Journal of Aboriginal Health*, November, 6–47.

and represents about two-thirds (63%) of Aboriginal females aged 15 to 34. The survey also revealed that three-quarters (76%) of violent incidents involving Aboriginal women that were committed by someone other than a spouse or common-law partner were not reported to the police, compared with 70% for non-Aboriginal women (Health Canada, 2009) (Box 9-7).

Language and Communication

Approximately 53 Aboriginal languages exist, with Algonquian being the largest and most widespread language family in Canada (Dickason, 2006). Many of these languages have identifiable dialects. Interpreters who can speak the various dialects within a language are invaluable, but locating them poses challenges to the health care system. Knowledgeable interpreters, however, not only understand and translate the patients' words but also interpret the culture and make relevant the concepts underlying it as well. For some Aboriginal Canadians, for instance, it is important to realize that reflection may lead to gaps, and thus long silences, in the conversation (Watts & McDonald, 2007).

Religious and Spiritual Practices

The spiritual approaches of Aboriginal peoples incorporate a mind-body-spirit connection that is harmonious with nature. For some, the circle of life is often viewed as having four aspects or directions: spiritual, physical, mental, and emotional. The presence of all components together enables the person to heal the self and restore well-being. It is in the understanding of wholeness that the spiritual, physical, mental,

emotional, and relational parts of the self are integrated. Transcending these dimensions, however, is the spiritual component, which assists the person in discovering his or her human potential (Hunter et al., 2004).

Caring Beliefs and Practices

Aboriginal peoples subscribe to a holistic concept of health but exemplify tremendous diversity of background and experience with regard to culture, language, and traditions (Wasekeesikaw, 2010). The caring beliefs and practices of various groups are linked to being alive and well, which may be understood as the interconnected relationship people create with the land and the plants and animals of nature. Aboriginal health and healing incorporates many aspects within the circle of life that includes, for instance, being human, stewarding the land, hunting wild animals, eating traditional foods, and practising herbal medicine. In a study that focused on the experience of diabetes among Aboriginal people living in a rural Canadian community (Barton et al., 2005a), the findings revealed cultural themes associated with Western and traditional medicines; dietary changes, exercise, and weight loss; culturally relevant communication; Aboriginal life choices and the responsibility to choose; and a belief in living day by day. Within this particular First Nations community, the researchers found that “(i) consultative meetings with community members; (ii) the use of a cultural awareness program for health professionals; and (iii) the involvement of Aboriginal people in the development of their own diet, exercise and prevention strategies would greatly enhance [diabetes] programs in the future. [Such initiatives] could contribute not only to the culturally safe management of diabetes, but also encourage its early detection now and in the future” (Barton et al., 2005a, p. 245).

Experience With Professional Health Care

Although cultural sensitivity frameworks will guide you in your relationships with patients, systematized and taxonomic descriptions of characteristics particular to a cultural group do not always “accommodate peoples’ diet preferences, communication styles, family dynamics, and culturally-based responses to pain, child-birth, childrearing, etc.” (Browne & Varcoe, 2006, p. 158). You need to ask yourself how you can think about notions of culture without stereotyping or thinking simplistically about Aboriginal people and without inciting hurtful and nonconstructive assumptions about cultural difference (Box 9-8). In contemplating this question, Dion Stout and Downey (2006) described the conceptual links between nursing, Aboriginal peoples, and cultural safety. They contended that (1) “the caring spaces that are occupied by Indigenous people and nurses are also potentially the new arenas of struggle for both sides”; (2) “attention between the totality of self and the totality of one’s environment is inherent in cultural safety affecting both nurses and Indigenous people”; and (3) “an overemphasis on culture as a health determinant can bring about an abdication of responsibility over all other health determinants by health determiners like Indigenous people and nurses” (p. 327) (Box 9-9).

Implications for Nursing Practice

The importance of cultural competency and safety for health care administrators, practitioners, and educators has been recognized by the National Aboriginal Health Organization (NAHO). NAHO’s (2008) document describes the origins of

BOX 9-8 RESEARCH HIGHLIGHT

Contemporary Perceptions of Health From an Indigenous (Plains Cree) Perspective



“Currently, there is limited literature demonstrating awareness of how contemporary Aboriginal peoples understand and define health, address their health concerns, and perceive barriers to obtaining optimal health. This knowledge is an important and essential first step in program planning for delivering effective health care for all aspects of health. An additional challenge is to effectively address and meet these needs in a timely manner which is critical to overall Indigenous wellness. The primary researcher, who is Indigenous (Plains Cree), wondered whether the social determinants of health were reflective and an appropriate framework to address the existing health disparities between Aboriginal and non-Aboriginal Peoples of Canada, and more specifically, the Plains Cree people from Thunderchild First Nation. [Their] paper examines the results from a qualitative descriptive research study completed in Thunderchild First Nation, Saskatchewan. There were four predominant themes that were derived from the data: health was consistently described in relation to physical, mental (intellectual), emotional, and spiritual wellness; value of health; factors related to the environment; and factors related to economics. Collectively, there does appear to be a holistic perception of health, similar to the teachings from the Medicine Wheel. Pursuing and maintaining health included a combination of information and practices from both the western and Traditional Indigenous world. This data supports that the determinants of health may be an appropriate framework to address the health needs of Indigenous Peoples, and an appropriate frame for federal, provincial and local policy makers to implement structural changes necessary to decrease the health disparities between the Indigenous Peoples and the rest of Canada” (Graham & Stamler, 2010, p. 6).

Reference: Graham, H., & Stamler, L. (2010). Contemporary perceptions of health from an indigenous (Plains Cree) perspective. *Journal of Aboriginal Health*, January, 6–17.

BOX 9-9 CASE STUDY

Mentorship Project: An Aboriginal Man With HIV

James is a 50-year-old two-spirited man from the Muskoday First Nation in northern Saskatchewan. He recently saw his family doctor in Prince Albert for an HIV test. When he returned to see the doctor for his results, he was very shocked to learn that his test was positive. James had lived with his partner, Sam, for more than 10 years; however, they separated about seven months ago. James is unsure of Sam’s HIV status.

As one of the nurses working in the STI clinic, James has been referred to you for an assessment. During his first visit to see you, James was very quiet and withdrawn, and it was difficult to engage him in a conversation. James would like return to his home community to live but is very hesitant to do this because he is afraid that he will not be accepted. He receives his medical care based on his First Nations status; however, he is worried that care for his HIV illness will not be covered.

1. How do you think you could demonstrate compassionate, culturally safe relationship-centred care with this patient?
2. How could you demonstrate effective and culturally safe communication with this patient?

cultural competency and cultural safety; a theoretical and methodological approach to cultural safety, an approach that originated with Aboriginal peoples; and the importance of its application to health care.

Increasingly, nurse scholars are researching the health challenges faced by Aboriginal peoples and providing an analysis of health policy (Smye & Brown, 2002). The exploration of cultural safety is also being taken up by other disciplines. From a sociological perspective, Brascoupé and Waters in a research paper define “cultural safety and how it differs from cultural competence or trans-cultural training and practices; shows why it’s important to move from the concept of cultural safety to the outcome of cultural safety, namely the success of an interaction; explores the idea of a shift from cultural safety for individuals to cultural safety at institutional and policy levels; and provides recommendations in five areas” (Brascoupé & Waters, 2009, p. 6). With regard to the success of an interaction, Harrowing et al. (2010) emphasize such an outcome begins with awareness of “the nurse’s reflection on his or her personal and cultural history, values, and beliefs and continues with the situating of those understandings within a framework of power imbalances, institutional discrimination, and colonizer-colonized relationships (p. 246). This is illustrated in the work of Smith et al. (2006) focused on establishing safety and responsiveness as a mainstay of care for pregnant and parenting Aboriginal people. Their findings revealed “that safety and healthcare relationships and settings, and responsiveness to individuals’ and families’ experiences and capacities must be brought into the forefront of care. [These] results suggest that the intention of care must be situated in a broader view of colonizing relations to improve early access to, and relevance of, care during pregnancy and parenting for Aboriginal people” (p. E27).

Reutter and Kushner (2010) in their article argue “that nursing has a clear mandate to ensure access to health and health-care by providing sensitive empowering care to those experiencing inequities and working to change underlying social conditions that result in and perpetuate health inequities” (Reutter & Kushner, 2010, p. 269). One reason why people become nurses is a desire to “act in ways that are respectful, compassionate, and equitable and that leave [nurses] feeling that [they] have somehow ‘done good’” (Hartrick Doane & Varcoe, 2005, p. 16). A relational approach to nursing shapes the places of inquiry and practice that determine how to find your way through relationships, culture, safety, ethics, diversity, power, economics, communication, and history. A deep consideration of **relational practice** and nursing obligations offers you the means to understand experience and to imagine how you might incorporate reflexivity, intentionality, and openness into practice, education, and research. It is from such a position of nursing inquiry that we are better able to interpret our own personal life threads and to elicit from enmeshed personal and professional life stories the insight and wisdom that guide us to becoming better human beings.

In regard to practice, Hartrick Doane and Varcoe (2007) present an example of a nurse recalling the interaction with an elderly woman in the emergency department who needed to be invited to reveal her “whole” experience. The woman’s story “exemplifies the significance of a nurse-patient relationship and the profound difference it can make in promoting health and healing” (p. 195). In the area of education, Smith and colleagues (2007) describe “community based stakeholders’ views of how safe and responsive care ‘makes a difference’

to health and well-being for pregnant and parenting Aboriginal people.” They concluded that “design and evaluation of care based upon community values and priorities and using a strengths-based approach can improve early access to a relevance of care during pregnancy and parenting for Aboriginal people” (p. 321). In considering research, Barton (2004) focuses on a form of narrative inquiry as a relational method of critically analyzing its appropriateness as an innovative approach to researching Aboriginal people’s experience of living with diabetes. By locating Aboriginal knowledge in a relational method such as narrative inquiry, “the ability to adapt a methodology for use in a cultural context, preserve the perspectives of Aboriginal peoples, maintain the holistic nature of social problems, and value co-participation in respectful ways are strengths of an inquiry partial to a responsive and embodied scholarship” (p. 519).

✦ KEY CONCEPTS

- Global health is an encompassing term with an understanding of the scope of the problems and not their location.
- Global citizenship is the active engagement of nurses becoming global citizens in identifying and acting on health inequities in the population they work with at the local, national, and international levels.
- Culture is the context for interpreting human experiences such as health and illness and provides direction for decisions and actions.
- Transcultural nursing is a comparative study and understanding of cultures to identify culture-specific and culture-universal caring constructs across ethnic groups.
- Culturally congruent care is meaningful, supportive, and facilitative because it conforms to valued life patterns of patients; it is achieved through cultural assessment.
- Culturally competent care requires knowledge, attitudes, and skills supportive of implementation of culturally congruent care.
- Cultural safety is an outcome of nursing education that enables safe service to be defined by patients who receive the service.
- Cultural assessment requires a comprehensive inquiry into the patient’s cultural values, beliefs, and practices; it may involve assessing ethnohistory, social organization, socioeconomic status, biocultural ecology and health risks, language and communication, religion and spirituality, caring beliefs and practices, and experiences with professional health care.
- Relational practice is the nursing obligation to examine relationships, ethics, and effective nursing practice, and the personal and contextual elements that continuously shape and influence nursing relationships.

✦ CRITICAL THINKING EXERCISES

1. You are about to begin giving an Arab Muslim man his morning care when he states, “I don’t want a bath now.” He becomes annoyed when you try to explain that you must give him a bath at this time. Before you leave the room, he asks you to leave a basin of water and towel by his bedside. He also asks you to get his prayer rug from his closet.
 - a. How should you respond to the patient?
 - b. What may be the reasons for his refusal and annoyance?
2. A 50-year-old Chinese woman is hospitalized with a respiratory condition. She insists that you give her warm water and rub her back with Tiger Balm liniment. When she receives her lunch, consisting of a turkey sandwich, tossed salad, and milk,

she keeps the turkey sandwich and tossed salad but asks that you take the milk away.

- a. How should you respond to the patient's requests?
 - b. What is the significance of her requests?
 - c. Why does she refuse her lunch?
3. You are assigned to a 60-year-old South Asian Hindu widow who is admitted with chest pain and shortness of breath. The patient recently arrived from India to visit her son and pregnant daughter-in-law. She can speak only Gujarati and understands very little English. She is accompanied by her son.
- a. What areas should you include in your focused cultural assessment?
 - b. How should you communicate with the patient?
 - c. Identify ways to preserve and accommodate the patient's culture in her care.
 - d. What aspects of the patient's way of life may need to be modified?

✦ REVIEW QUESTIONS

1. Socialization into one's primary culture during childhood is known as
 1. Enculturation
 2. Acculturation
 3. Assimilation
 4. Multiculturalism
2. Multiculturalism results when a person
 1. Has an experience with a new or different culture that is extremely negative
 2. Maintains his or her culture and interacts peacefully with people of other cultures
 3. Gives up his or her ethnic identity in favour of the dominant culture
 4. Adapts to and adopts a new culture
3. Cultural awareness involves an in-depth self-examination of one's
 1. Background, recognizing biases and prejudices
 2. Social, cultural, and biophysical factors
 3. Engagement in culturally safe interactions
 4. Motivation and commitment to caring
4. Culturally safe care is the process of
 1. Learning about vast cultures
 2. Delivering care that is based on knowledge of the patient's cultural heritage, beliefs, and attitudes
 3. Influencing treatment and care of patients
 4. Motivation and commitment to caring
5. Ethnocentrism is the root of
 1. Stereotypes, biases, and prejudices
 2. Meanings by which people make sense of their experiences
 3. Cultural beliefs
 4. Individualism and self-reliance in achieving and maintaining health
6. When a person acts on his or her prejudices,
 1. Discrimination occurs
 2. Sufficient comparative knowledge of diverse groups is obtained
 3. Delivery of culturally congruent care is ensured
 4. Effective intercultural and relational communication develops
7. The prevailing value orientation in Western society is
 1. Use of rituals symbolizing the supernatural
 2. Group reliance and interdependence
 3. Healing emphasizing naturalistic modalities
 4. Individualism and self-reliance in achieving and maintaining health
8. Disparities in health outcomes between rich and poor patients illustrate
 1. The attribution of illness to natural, impersonal, and biological forces
 2. Biological and sociocultural health risks
 3. Influence of socioeconomic factors in morbidity and mortality
 4. Combination of naturalistic, religious, and supernatural modalities
9. Global health is a concept that focuses
 1. On issues that affect the health of the population of a particular community or country
 2. Mainly on prevention programs for populations
 3. On issues that directly or indirectly affect health but that can transcend national boundaries
 4. On a few disciplines, but has not emphasized multidisciplinary
10. The prevailing values in Western society on individual autonomy and self-determination
 1. Rarely have an effect on other groups
 2. Do not have an effect on health care
 3. May hinder ability to get into hospice programs
 4. May be in direct conflict with the values of diverse groups

✦ RECOMMENDED WEB SITES

Canada's Commitment to Cultural Diversity: Cultural Diversity: A Canadian Perspective: <http://www.pch.gc.ca/pgm/ai-ia/rir-iro/gbll/divers/index-eng.cfm>

Citizenship and Immigration Canada: <http://www.cic.gc.ca/english/index.asp>

Aboriginal Nurses Association of Canada: <http://www.anac.on.ca/>

Canadian Nurses Association: <http://www.cna-aiic.ca/>

Canadian Association for International Nursing (CAIN): <http://www.cainursing.ca/>

Canadian Red Cross: <http://www.redcross.ca/>

Canadian International Development Agency: <http://www.acdi-cida.gc.ca/>

Canadian Society for International Health: <http://www.csih.org/>

Canada World Youth: <http://www.canadaworldyouth.cwy-jcm.com/>

CUSO-VSO: <http://www.cuso-vso.org/>

International Council of Nurses (ICN): <http://www.icn.ch/>

Médecins sans Frontières: <http://www.msf.ca/>

National Aboriginal Health Organization (NAHO): <http://www.naho.ca/>

United Nations Development Program: <http://www.beta.undp.org>

Review Question Answers

1. 1, 2, 2, 2, 3, 1, 4, 2, 5, 1, 6, 1, 7, 4, 8, 3, 9, 10, 4

Rationales for the Review Questions appear at the end of the book.

Nursing Leadership, Management, and Collaborative Practice

Written by Susan M. Duncan, RN, PhD

objectives

Mastery of content in this chapter will enable you to:

- Define the key terms listed.
- Describe entry-level professional nurse competencies related to leadership, management, and collaborative practice.
- Describe the relationships between nursing leadership and healthy practice environments, patient safety, and quality patient care outcomes.
- Discuss how a nurse leader can contribute to collaborative practice and best practices implementation.
- Discuss ways to apply skills of clinical care coordination in nursing practice.
- Discuss principles for the appropriate delegation of patient care activities.
- Describe the purpose, elements, and models for quality practice environments and patient safety.
- Identify strategies for developing entry-level competencies related to management and leadership in nursing.

key terms

Accountability, p. 132	Interprofessional teams, p. 129
Authority, p. 132	Intraprofessional teams, p. 129
Autonomy, p. 132	Leadership and management, p. 125
Best practice guidelines, p. 130	Mentoring, p. 137
Career development, p. 138	Models of care, p. 129
Case management, p. 129	Nurse-sensitive outcome, p. 135
Collaborative practice, p. 126	Outcomes, p. 126
Competencies for safe practice, p. 135	Primary nursing, p. 129
Continuity of care, p. 128	Quality improvement (QI), p. 135
Decentralized or participatory management, p. 131	Responsibility, p. 132
Delegation, p. 134	Team nursing, p. 129
Healthy practice environment, p. 126	Transformational Leadership, p. 126

media resources

evolve WEBSITE

<http://evolve.elsevier.com/Canada/Potter/fundamentals/>

- Audio Chapter Summaries
- Examination Review Questions
- Glossary
- Student Learning Activities
- Weblinks

All nurses must be leaders, and nurses assume positions of leadership and management in health care delivery much earlier in their careers today than in previous generations: "Nursing leadership is about nurses who understand that the development of nursing leaders must begin at the outset of every nursing education program and continue throughout the career of every nurse" (Canadian Nurses Association [CNA], 2009b). It is therefore important that you develop an understanding of **leadership and management** roles in nursing early in your educational program and the relevant competencies required of entry-level nurses. As you develop the knowledge and skills to enter the nursing workforce, you also learn how to become a leader among colleagues for the delivery of care in many health care settings. Phrases such as "from the bedside to the boardroom" (Institute of Medicine [IOM], 2011) and "nurse educators must prepare students to lead where they land" (Fugate Woods, 2003, cited in CNA, 2009b) indicate the centrality of leadership in all nursing practice settings and roles. You can see from the list of competencies required of entry-level nurses in Box 10-1 that leadership begins

► BOX 10-1

Entry-Level Staff Nurse Competencies Related to Leadership and Management

- Is accountable and responsible for own actions and decisions, including personal safety
- Demonstrates leadership in providing patient care by promoting healthy and culturally safe work environments
- Displays initiative, self-confidence, and self-awareness, and encourages collaborative interactions within the nursing and health care team
- Organizes own workload and develops time-management skills for meeting responsibilities
- Integrates quality improvement principles and activities into nursing practice
- Uses relational knowledge and ethical principles when working with students and other health care team members to maximize collaborative patient care
- Participates in and contributes to nursing and health care team development
- Supports professional efforts in the field of nursing to achieve a healthier society (e.g., lobbying, conducting health fairs, and promoting principles of the *Canada Health Act*)
- Demonstrates an awareness of healthy public policy and social justice
- Develops support networks with registered nurse (RN) colleagues, health care team members, and community supports

Adapted from College of Registered Nurses of British Columbia. (2009). *Competencies in the context of entry-level registered nurse practice in British Columbia. Leadership and management practices for healthy work environments*. Vancouver: Author. Retrieved from <https://www.crnbc.ca/Registration/Lists/RegistrationResources/375CompetenciesEntryLevelRN.pdf>.

with a strong professional identity and accountability. For optimal nursing care, managers and leaders are needed to ensure both the vision for quality care and the management skills required for best practices and quality care (Hibberd et al., 2006). Whereas *leadership* refers to a shared vision, values, organizational strategy, and relationships, *management* most often refers to the competencies required to ensure the day-to-day delivery of nursing care according to available resources and standards of professional practice. To be effective in promoting a healthy work environment and a healthy society, nurses must demonstrate leadership practices that honour the importance of relationships, values, and transformational change in health systems (Cummings, 2004; Gifford et al., 2006; IOM, 2011; Pearson et al., 2007). Nursing leadership is needed at every level, and nurses must be full partners in change with physicians and other professionals and sectors of society (IOM, 2011). Figure 10-1 provides a conceptual model of **transformational leadership** practices that have been identified as contributing to health **outcomes**. Researchers identify that transformational and relational models of leadership best contribute to healthy work environments for nurses, including nurse retention and recruitment (Cummings et al., 2010).

In the current context of health care in which qualified care providers are in short supply, competencies associated with leadership in nursing relate to creating environments for healthy working relationships and teamwork. A healthy work environment is most likely to retain nurses in practice settings in which they are both satisfied and able to provide high-quality care. RNs must work collaboratively with other

members of the nursing team, as well as with professionals from other disciplines and with patients and families.

The importance of such work is most often discussed as **collaborative practice**, defined as working together toward mutually identified goals while valuing different perspectives and accountabilities of individual team members (Gardner, 2005; Registered Nurses' Association of Ontario [RNAO], 2010b). This chapter therefore focuses on current thinking in nursing leadership and management, including definitions, roles and relationships, shifts to collaborative practice models, and the role of leaders in ensuring healthy practice environments and best practices. The ideas and examples included in this chapter apply to the different practice settings in which nurses work: in homes, in institutions, and in communities.

Management and Leadership Roles for Nurses

Nurses assume a wide variety of management and leadership roles in health care organizations in order to ensure that patients receive safe and high-quality care. Research has revealed that nurses must provide leadership to ensure that nursing care takes place in quality practice environments (Aiken et al., 2002, 2008; Health Canada, 2002; Pearson et al., 2007) and that these work environments are essential for health, high-quality patient care, and patient safety (Estabrooks et al., 2005; Wong & Cummings, 2007). A high-quality practice environment is also a healthy work environment, defined as “a practice setting that maximizes the health and well-being of nurses, quality patient outcomes, organizational performance and societal outcomes” (RNAO, 2010a, p. 13).

A **healthy practice environment** begins with the senior nurse leader in the organization, who most often holds the title of Chief Nurse Executive, Chief Nursing Officer, or Director or Vice-President of Nursing or of Patient Care (Health Canada, 2002). In 1999, the government of Canada instituted the first Office of Nursing Policy with Dr. Judith Shamian, RN, Executive Director, hired to provide leadership to ensure that attention was paid in government to the nursing perspective on programs and policies (Health Canada, n.d.). Since then, several provinces have followed suit, instituting provincial nursing policy offices led by nurses in executive positions. These positions are key to ensuring that nurses influence the policy directions that governments take to ensure high-quality nursing services for Canadians. In policy roles, nurses act as policy advocates and as such have made a difference throughout history; they continue to advocate today for progressive public policy in primary health care and to achieve health equity (Reutter & Kushner, 2010) (see Unit I). As a student, you will learn the skills involved in nursing advocacy and assume the role of advocate to promote the health of people. Nurses today “stand on the shoulders of giants”; the nurse leaders of the past held a powerful vision for the development of nursing as a profession and advocated tirelessly to bring this vision to fruition (“A century of progress,” 2005). One such leader was Ethel Johns, director of the University of British Columbia's first nursing school. She inspired other nurses with her vision and challenged them to think for themselves (Boxes 10-2 and 10-3).

Nursing Care Delivery Models, Collaborative Practice, and Nursing Teams

As in the past, a strong nurse executive unites the strategic direction of the organization with the values and goals of

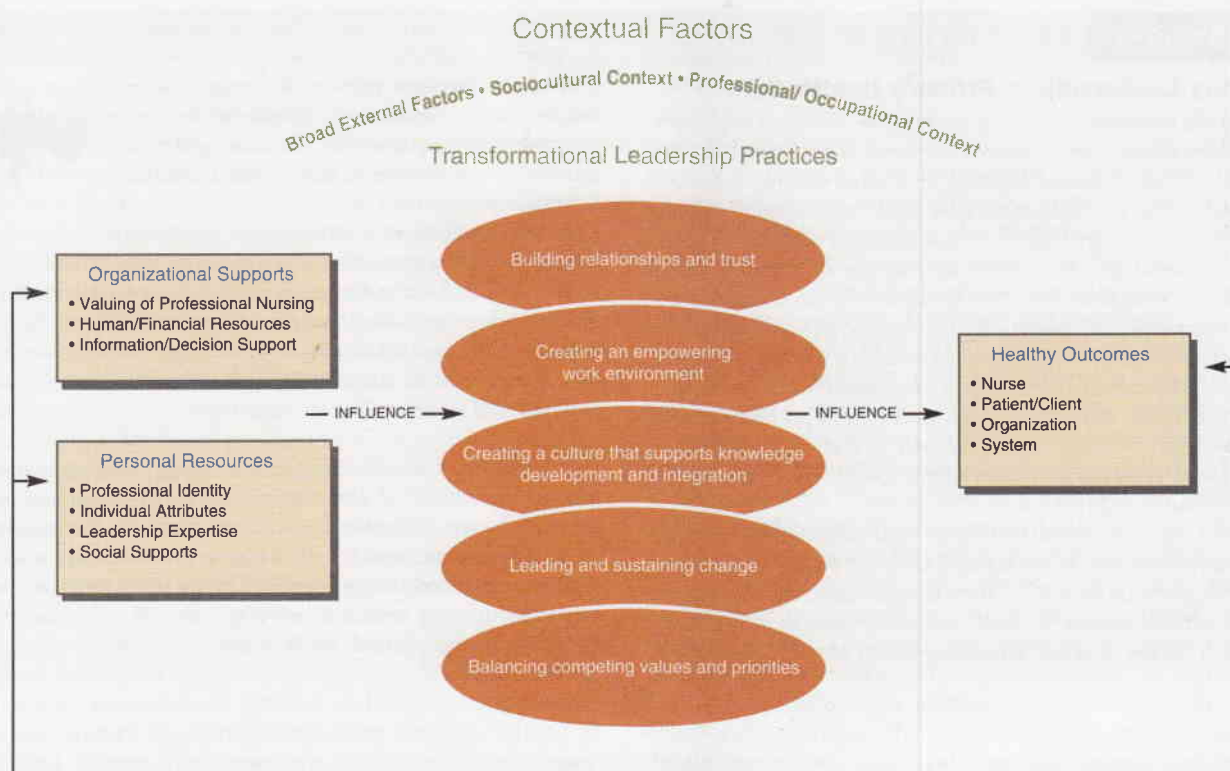


Figure 10-1 Conceptual model for developing and sustaining leadership. This model organizes and guides the discussion of the Registered Nurses' Association of Ontario (RNAO) recommendations. It provides a framework for understanding the leadership practices needed to achieve healthy work environments and the organizational supports and personal resources that enable effective leadership practices. **Source:** From Registered Nurses' Association of Ontario. (2010, March). *The healthy work environments quick reference guide for nurses* (p. 23). Toronto: Author.

BOX 10-2 Milestones in Canadian Nursing History



Ethel Johns, 1879–1968

A 1902 graduate of the Winnipeg General Hospital School of Nursing, Ethel Johns served as head nurse of several units at this hospital before becoming the first staff nurse to oversee its X-ray department. In 1907, she assumed editorship of its *Nurses Alumnae Journal* and began contributing to *Canadian Nurse*. Her literary talent, combined with her ability to challenge nurses to think independently, led to her nomination for membership in the Canadian Women's

Press Club in 1911. In 1913, Johns took a position as head surgical nurse at Good Samaritan Hospital in Los Angeles. After returning to Manitoba in 1915, she assumed the post of superintendent of the Children's Hospital of Winnipeg. She also worked tirelessly for the registration of nurses in Manitoba. Johns held strong convictions about social issues and nursing, and she supported needed reforms. During the Winnipeg General Strike of 1919, her pro-labour views led her into conflict with the Children's Hospital board of directors, and she resigned.

Subsequently, Johns was appointed director of the Department of Nursing at the University of British Columbia, which offered the first Canadian university degree program in nursing. In 1929, she became director of nursing studies at New York Hospital, Cornell Medical College. She also worked on a landmark study of nursing education in the United States. In 1933, Johns became editor of *Canadian Nurse*, which enabled her to communicate with a wide audience of nurses. Dr. Rae Chittick, president of the CNA during Johns's tenure as editor, praised Johns for bringing to the position "a world perspective on nursing, a hospitality of the mind from her rich experience . . . She . . . reached out to challenge nurses to think for themselves and to create a body of nursing opinion on the changes essential to meet the health needs of a rapidly expanding nation." In 1947, Johns helped establish a new journal, *Just Plain Nursing*, which continued publication for the next 13 years. Also in 1947, Johns Hopkins Hospital asked her to write a history of its School of Nursing; this history was published in 1953. Later, she published the *Winnipeg General Hospital School of Nursing, 1887–1953*.

The CNA awarded Johns the Mary Agnes Snively Memorial Medal in 1940 and an honorary life membership in 1958 in recognition of her leadership in Canadian nursing.

Based on Street, M. M. (1973). *Watch-fires on the mountains: The life and writing of Ethel Johns*. Toronto: University of Toronto Press.

BOX 10-3 FOCUS ON PRIMARY HEALTH CARE

Nursing Leadership in Primary Health Care

Nursing as a profession has taken a strong leadership role in implementing primary health care throughout the world. Since 1978, the International Council of Nurses, the CNA, and other national, provincial, and territorial nursing associations have been instrumental in lobbying for inclusion of primary health care principles and programs in health care professional education, in service planning and delivery, and in research and evaluation. The CNA (2009a) actively promotes initiatives to incorporate primary health care into nursing practice and policy. Primary health care principles enshrined in policy is the way to promote health for all people and is based on social justice model and values (Reutter & Ogilvie, 2011). Nursing advocacy for primary health care as the foundation of health care is required of leaders at all levels of practice and organizations (International Council of Nurses, 2008; Reutter & Kushner, 2010).

There is reason to believe that nurses must play an even larger role in primary health care in the future (Duncan & Whyte, 2010; World Health Organization [WHO], 2008) to provide leadership necessary for transformational change in health systems worldwide. WHO (2008) calls for a greater emphasis on primary health care to reform health

systems worldwide, a process of change that will require nurses everywhere to provide leadership by demonstrating commitment to the values and principles of PHC and envisioning new roles and opportunities to promote health.

If nurses are to have the influence that is needed to transform health systems, they must develop the vision, knowledge and skills for primary health care. Nurses learn to influence systems through their work in organizations and most importantly by working collectively in nursing and other types of associations. Nursing associations have a pivotal role to play in ensuring that the voice and influence is expressed and represented as the largest group of health professionals worldwide:

"The ICN and its member national nurses associations (NNAs) promote and support all efforts to improve the preparation of nurses for management, leadership and policy development. The preparation should be broad and must include the development of knowledge and skills for influencing change, engaging in the political process, social marketing, forming coalitions, working with the media and other means of exerting influence" (ICN, 2008).



nursing. Nurse executives must also build teams of leaders who work across the organization to implement best practices and develop high-quality work environments in which nursing practice can flourish. Although it takes a strong senior nursing leader to inspire a healthy work environment, the role and responsibility of every nurse is to provide leadership to make a difference by (CNA, 2009b) displaying attributes such as articulating a vision, enabling others to act, encouraging others, and taking initiative. The leader and nursing staff must share a philosophy of care that integrates purpose, best practices, and concern for relationships, including how staff will work together and with patients and families (Box 10-4).

Integral to the philosophy of care is the selection of a nursing care delivery model and a management structure that support professional nursing practice. Ideally, the vision for patient care should drive the selection of a care delivery model (RNAO, 2010a). A nursing care delivery model is a system for organizing and delivering nursing care to patients and their families, and it represents structural and contextual elements of nursing practice (Fowler, Hardy & Howarth, 2006, cited in CNA, Canadian Council for Practical Nurse Regulators & Registered Psychiatric Nurses of Canada [in press]). Key factors contributing to success are strong nursing leadership, decision-making authority for nurses who provide direct care, and effective respectful communications with colleagues, physicians, and other health care providers (Health Canada, 2002; Canadian Patient Safety Institute, 2009; Hinshaw, 2008; Manojlovich et al., 2008).

Nursing care delivery models are designs that determine how nurses provide care. Historically, the choices of a nursing care delivery model have been influenced by the social and economic conditions, and this is the case today when care models are changing because of a shortage of nurses and other health care providers (Manojlovich et al., 2008). **Continuity of care** is an extremely important concept in determining the choice of a nursing care delivery model. *Continuity of care* is defined as "a seamless continuous implementation of a plan

➤ BOX 10-4

Developing a Vision for a Nursing Unit or Program

What Is the Nursing Unit's Purpose or Mission?

- Articulating why it exists
- Ensuring that nursing services are based on primary health care principles
- Knowing the background of health needs and perspectives of patients and population (internal and external)
- Knowing the background of its collaborative team members: their professional preparation, identity, and unique contributions
- Demonstrating how it accomplishes organizational goals or vision

How Will Staff Work With Patients and Families?

- By placing patient's and family's needs first with a patient-focused approach
- By involving patients and families as members of a collaborative practice team
- By making effective communication a priority

What Are the Standards of the Work Unit?

- Staff members adhere to professional accountability practice according to standards of practice and codes of ethics
- Staff members practise within a culture of safety
- The work unit integrates evidence-informed best practices
- Staff members work collaboratively with all members of the health care team

What Are the Key Values?

- Creating and maintaining a healthy practice environment
- Recognizing social justice issues
- Supporting relational practice
- Being self-aware, motivated, and accountable
- Supporting a learning environment
- Providing culturally safe care

of care that is reviewed and revised to meet the changing needs of the client” (RNAO, 2010b, p. 61). It refers to continuity of information or knowledge, continuity of relationships between a patient and one or more health care providers over time, and continuity of management of care across organizational boundaries (Smith et al., 2006). In the choice of nursing care delivery models, it is important to consider how nurses ensure that a patient’s plan of care is as consistent as possible. As change occurs in health care delivery and nursing practice, new care delivery models are evolving (Kimball et al., 2007; LeClerc et al., 2008). In the current context, a patient care model known as the *collaborative practice model*, which includes nurses and others, incorporates some of the features of earlier models.

Nursing care delivery models of today entail higher staff ratios of unregulated care providers (UCPs) in many settings of practice, including home care, institutional acute care, and residential long-term care. The title of the UCP typifies the role of providing front-line personal and delegated care to increasing numbers of patients across different health care settings in Canada. UCP practice is not defined by qualifications or established standards. The title of the role differs from province to province, as does its requirement for training or educational programs. In British Columbia, for example, UCPs are referred to as health care assistants (HCAs) and they are required to take a preparatory six-month certification program offered in public and private postsecondary educational institutions. This is not the case in all provinces; for example, in Alberta, UCPs are not required to have educational preparation, and they are referred to as *patient care attendants* (PCAs).

Traditional Models of Care. Terms that describe models of care that have been present over the past century include *functional nursing*, *team nursing*, and *primary care*. These models have existed primarily in institutional settings, and elements of them may be seen in practice today. Functional nursing became popular during World War II in response to a nursing shortage, where nurses focused on tasks as opposed to assuming responsibilities for a group of patients. The disadvantages of functional nursing are problems with continuity of care, absence of a holistic view of patients, and the possibility that care will become mechanical and fragmented (Dadich, 2003). Despite the critique of functional nursing, you may see aspects of this model in practice today—for example, when a nurse assumes sole responsibility for all patient medications in a long-term care setting.

Team nursing developed in response to the nursing shortage after World War II (Marriner Tomey, 2004). It involves the coordinated delivery of nursing care by various staff members. A registered nurse (RN) leads a team of other RNs, registered psychiatric nurses (RPNs), licensed practical nurses (LPNs), UCPs, or a combination of these professionals. The task orientation of the model in the past and the fact that nurses do not always interact with the same patients each day can result in a lack of continuity of care. An advantage of team nursing is the collaborative style that encourages each member of the team to help the other members. This model has a high level of autonomy for the team leader and is an example of decision making at a clinical level (Marriner Tomey, 2004). Elements of this former team nursing model may be present in emerging models of collaborative practice with the evolution to more patient care focused on participatory relationships.

The **primary nursing** model aimed to place RNs at patients’ bedsides and improve nursing accountability for patient outcomes and relationships among staff (Ritter-Teitel, 2002).

Primary nursing supports a philosophy of strong nurse–patient relationships. Primary nursing maintains continuity of care across shifts, days, or visits. It can be applied in any health care setting. When a primary nurse is off duty, other team members, including RPNs, LPNs, or other RNs, follow the care plan. If differences in opinion occur, associate and primary nurses collaborate to redefine the plan as necessary. The strengths of this model may also be realized in new models of care that extend primary care models to fit the current health care delivery system and emphasize collaborative relationships, evidence-informed practice, and continuity of care (Jost et al., 2010; LeClerc et al., 2008).

Emerging Models of Care. Emerging models of care emphasize the role of the RN in providing a continuity of care to patients across settings. Another goal of emerging models of care is to emphasize and acknowledge that the skill and knowledge of the RN is needed in patient care as well as providing coordination and management of teams. The **case management** model is one that emphasizes the coordination of an array of health services and links them to patients and their families while streamlining costs and maintaining quality (Dadich, 2003). The term *case manager* has been criticized because patients and families are not “cases” to be managed (Smith et al., 2006). Case management, as it has evolved, is “a collaborative process which assesses, plans, implements, coordinates, monitors, and evaluates the options and services required to meet an individual’s health needs, using communications and available resources to promote quality, cost-effective outcomes” (Case Management Society of America, 2008). Clinicians, as individuals or in teams, care for patients with specific conditions and associated care needs (e.g., patients with complex nursing and medical problems) and are usually held accountable for quality and cost management. Many case managers use critical pathways, or “care maps,” which are multidisciplinary treatment plans for patients with specific case types (see Chapter 12). The plans help in the delivery of timely, coordinated care.

Roles of case managers vary across health care settings, including long-term care, home care, community mental health, and acute care institutions, and these professionals increasingly coordinate and integrate care across settings. Roles and responsibilities of case managers across settings include clinical expert, advocate, educator, facilitator, negotiator, manager, and researcher (Smith et al., 2006).

The collaborative practice model is increasingly used by **intraprofessional nursing teams** (teams whose members provide nursing care) and by other health care providers who are members of the **interprofessional team**. A call for interprofessional team and collaborative practice development has been sounded across Canada because this model is viewed as the way to ensure that all professionals and providers can practise to the full potential of their role and competencies. Collaborative practice is therefore also the best way to ensure that health human resources are used most effectively during a time of shortage in the achievement of quality care and population health outcomes. It is important for students in nursing and other professional health care programs to learn the competencies associated with collaborative practice during their educational programs. As a student, you are an integral member of both nursing and interprofessional teams that cross health care settings, including acute care, mental health care, community and home care, and public and population health care (RNAO, 2010b). One of the first and most important

responsibilities is to learn about the roles and responsibilities of other team members. Central to the collaborative practice model are the patient, family, and population as full participants in care or service delivery. Nurse leaders in the Vancouver Coastal Health Authority (2007) launched an important initiative to support the shift in thinking required for collaborative practice among teams of nurses and health care providers and across disciplines. This initiative provides opportunities for RNs, LPNs, UCPs, and members of other health care professions to learn from each other and to understand and respect their different roles and responsibilities. It also provides educational sessions in which team members learn about the competencies necessary in collaborative practice on a day-to-day basis in the work setting.

The RNAO (2010b) developed evidence-informed **best practice guidelines** for collaborative practice. These guidelines show how teamwork and collaborative practice can be supported at individual, team, organizational, and system levels of nursing practice. These guidelines are comprehensive and indicate the need for transformational leadership to support a culture of teamwork and collaboration. Thus, a collaborative practice model potentially incorporates the best of other care delivery models, including team, primary, and case management models previously discussed. It is important for students and entry-level nurses to acquire competencies that promote collaboration among teams as identified in Box 10-5.

Nurses are well situated to provide leadership for collaborative practice in many health care settings. One example may be found in the home care setting, in which nurses work

closely with UCPs, who provide a large amount of the continuous day-to-day care for patients who have been discharged from hospitals after undergoing surgery or who have chronic illnesses and disabilities. UCPs must have opportunities to meet and communicate regularly with the nurses and other professionals involved in the care of the patients, to ensure that they understand the patient situation and receive support for the challenges they face in providing care. Nurses can also aid UCPs by providing education and other supports so that they are able to contribute to best practices in important areas such as safety, emotional support, and wound healing. In this way, UCPs are recognized and valued for their role, and the continuity of care to a single patient or family is supported by UCPs, nurses, and other health care providers. Nurses who are employed in long-term or residential care settings may also provide leadership for collaborative practice by ensuring opportunities for communication and learning among professionals involved in teams or systems of care.

Home care delivery also often includes social workers, physicians, nutritionists, physiotherapists, and other health care providers, as well as nurses and UCPs. At the centre of the collaborative practice model is the patient and family; research is just beginning into how health care providers and other caregivers include patients as part of the team or the social network of care (Cott et al., 2008). A nurse in home care or another practice setting is well situated to provide leadership for collaborative practice by providing opportunities for patients and families to meet with caregivers and by ensuring that the patient's voice is heard in his or her care planning.

Health care in the twenty-first century will require nurses to work with other members of the health care team and collaborate with other community members, agencies, and organizations outside of the health sector. Intersectoral collaboration is a principle of primary health care, requiring nurses and others to develop skills in engaging with others to influence health in the broadest way possible. This ability to collaborate across professions and organizations requires the development of competencies in communication and conflict resolution, team functioning, and collaborative leadership that starts with a deep understanding of one's own professional role and contribution, as well as the appreciation of others' contributions (Canadian Interprofessional Health Collaborative [CIHC], 2011). Implementing collaborative practice among professionals requires that no one professional group dominates, leadership is shared, and differences in knowledge and contributions are understood and respected. Educators and practice leaders in the health professions are working to envision and develop education strategies to prepare students to graduate with interprofessional competencies.

Decision Making

One of the most important recommendations to achieve healthy practice environments is that staff at all levels be involved in decision making about nursing practice. It is of utmost importance that the voice and decisions of nurses who are providing care are valued and acted upon. Of equal importance is that the most senior nurse in the organization be included in the executive decision-making level of the organizations and agencies, including those responsible for the delivery of home care, mental health care, public health care, or hospital care. The nurse executive supports managers and staff by creating a management structure that helps achieve organizational goals and provides support for participatory

► BOX 10-5

RNAO Best Practice Guideline: Nursing Collaborative Practice

Guideline 1.4: Nursing teams establish clear processes and structures that promote collaboration and teamwork that leads to quality work environments and outcomes for patients by

- Establishing processes for conflict resolution and problem solving
- Establishing processes to develop, achieve, and evaluate team performance
- Developing systems and processes to recognize and reward success
- Incorporating nonhierarchical, democratic working practices to validate all contributions from team members
- Incorporating processes that support continuity of care with patients to enhance staff satisfaction, staff self-worth, and patient satisfaction
- Developing and implementing processes that clarify their understanding of the unique and shared aspects of roles within the teams
- Ensuring that the composition of the team is adequate to achieve their goals and meet their responsibilities to the needs of the patient population
- Establishing processes for decision making for a variety of circumstances such as
 - Emergencies
 - Day-to-day functioning
 - Long-term planning
 - Policy development
 - Care planning

From Registered Nurses' Association of Ontario. (2006, November). *Healthy work environments best practices guidelines: Collaborative practice among nursing teams* (p. 33). Toronto: Author.

decision making and collaborative practice models. With a vision for nursing established, the manager helps staff realize that vision.

Decentralized or participatory management, in which decision making occurs at the staff level, is a vital part of a healthy work environment and effective health care organization; however, it has not been achieved to the extent needed. The advantage of this structure is that managers and staff are actively involved in shaping an organization's identity and determining success. Decentralized management requires workers to be empowered to accept greater responsibility for the quality of patient care (Ellis & Hartley, 2005). A decentralized structure has the best potential to lead to positive outcomes, such as increased collaboration among staff, best practice implementation, and patient satisfaction (Table 10-1).

The nurse manager is crucial for the successful functioning of nursing units and systems. Figure 10-2 illustrates the responsibilities and competencies of nurse managers, including

supervising, planning, scheduling, and staffing, as situated within a framework of leadership competencies.

Nurse managers must enable decision making by the professionals who are most involved and must encourage inclusion rather than exclusion of staff (RNs, RPNs, LPNs, UCPs, unit administrators, and secretaries). Nurse managers of today are making crucial decisions about the nursing care delivery models and staff mix that will best meet patient needs and promote optimum health outcomes. Three national nursing groups representing RNs, LPNs, and RPNs have worked with leading nurse researchers, including Dr. Linda McGillis Hall, to identify evidence-informed guiding principles for making staff mix decisions for quality care (Box 10-6). These principles can be realized only through collaborative nursing leadership, with values of inclusiveness and evidence-informed decisions about nursing care delivery models.

Nurses must develop skills and knowledge to exercise responsibility, autonomy, authority, and accountability in

► **TABLE 10-1** Examples of Management Structures

Structural Approach

Centralized management

Decentralized/participatory management

Matrix

Characteristics

A single administrator leads the organization, and directors oversee departments or programs. Decisions are made by the leader and directors, with little staff input. Managers have minimal responsibility or accountability for operation of nursing unit. Staff do not feel involved in care processes, and collaborative practice is not supported.

Staff members with the most knowledge about an issue participate in decision making. Structures such as professional practice councils exist to promote collaboration and decision making. Managers responsible for nursing care units or community programs often have accountability and responsibility for staffing decisions, budget, and day-to-day management of work unit.

Traditional units are reorganized into business units. Staff may report to several managers—such as one with responsibility for professional practice (e.g., nursing) and another with responsibility for a specific program (e.g., child and family health)—who may be from a variety of professional practice backgrounds.



Figure 10-2 Management and leadership competencies. **Source:** From Canadian Nurses Association. (2005). *Nursing leadership development in Canada* (p. 28). Ottawa: Author.

► BOX 10-6

Five Guiding Principles for Staff Mix Decision Making

- Decisions concerning staff mix respond to clients' health care needs and enable the delivery of safe, competent, ethical, quality, evidence-informed care in the context of professional standards and staff competencies.
- Decision making regarding staff mix is guided by nursing care delivery models based on the best evidence related to (1) client, staff, and organizational factors influencing quality care and work environments, and (2) client, staff, and organizational outcomes.
- Staff mix decision making is supported by the organizational structure, mission, and vision and by all levels of leadership in the organization.
- Direct care nursing staff and nursing management are engaged in decision making about the staff mix.
- Information and knowledge management systems support effective staff mix decision making.

Source: Canadian Nurses Association. (March, 2012). Staff mix decision-making framework for quality nursing care. Ottawa: Author.

order to participate fully in organizational decision making and collaborative practice (Anders & Hawkins, 2006).

Responsibility refers to the duties and activities that an individual is employed to perform. A professional nurse's responsibilities in a given role are outlined in a position description of the nurse's duties in patient care and of participation as a member of the nursing team. Managers must be sure that staff members understand their responsibilities, particularly during change. For example, when hospitals restructure and patient care delivery models change, the manager must clearly define the nurse's role within the new care delivery model. If decentralized decision making is in place, professional staff can help shape the new nurse role. All nurses are responsible for knowing their role in developing competencies.

Autonomy is the freedom of choice and responsibility for choices (Marriner Tomey, 2004). With autonomy, a nurse can make independent decisions about patient care according to the role and scope of practice. Innovation by nurses, increased productivity, higher employer retention of nurses, and greater patient satisfaction are results of autonomy in nursing practice (Estabrooks et al., 2005; Health Canada, 2002; Hicks, 2003).

Authority to act is the right to act in areas in which a nurse has been given and accepts responsibility according to legislation, standards, and the code of ethics governing the professional practice of nursing. Nurses have authority to act and to question actions concerning the practice of other professionals in relation to this scope of responsibility. For example, a nurse who as a case manager finds that the nursing team did not follow a discharge teaching plan for an assigned patient has the authority to consult with other nurses to learn why the plan was not followed. The nurse as case manager has accepted responsibility for the care of a group of patients and therefore has the final authority in selecting the best course of action for the patient's care, while collaborating with others to ensure quality outcomes.

Accountability means being answerable for one's actions. It means that as a nurse, you accept the commitment to provide excellent patient care and the responsibility for the outcomes of actions in providing that care (Anders & Hawkins, 2006). A



Figure 10-3 Students in nursing and other health care provider programs learning about their roles and contributions to collaborative practice. **Source:** Copyright © René Mansi, iStockPhoto.

nurse is accountable for patients' outcomes. In the example just described, the nurse as case manager is accountable for the patient's health outcomes by ensuring a continuity of care across hospitalization and home care.

A successful decentralized nursing unit exercises the four elements of decision making: responsibility, autonomy, authority, and accountability. The staff must meet routinely to discuss how to maintain equality and balance in these elements. Individuals should be comfortable in expressing differences in opinion and challenging the status quo, while understanding their own responsibility, autonomy, authority, and accountability.

Supporting Staff Involvement. In decentralized decision-making structures, all staff members actively participate in unit or agency activities (Figure 10-3). Staff members benefit from the knowledge and skills of the entire team. If the staff members value knowledge and their colleagues' contributions, patient care improves. The nursing manager supports staff involvement through the following approaches.

Establishment of Nursing Practice or Professional Shared Governance Councils. Chaired by senior clinical staff, these councils are empowered to maintain care standards for nursing practice (Gokenbach, 2007). The councils review and establish standards of care, develop policy and procedures, resolve patient satisfaction issues, or develop new documentation tools. Mechanisms are established to empower all staff to contribute input on practice issues. Managers might not sit on the council, but they receive progress reports. The types of work in the nursing unit is what determines council membership. Professionals from other disciplines (e.g., pharmacy, respiratory therapy, social work, medicine, or clinical nutrition) might participate in these councils. Professional practice councils can advocate for resources and conditions necessary for healthy practice environments and safety.

Interprofessional Collaboration. As previously described, collaborative practice among professionals from different disciplines is essential to ensuring that health human resources are used in the best possible way. Whenever systems or programs are redesigned, interprofessional involvement is crucial because most health care processes involve more than one discipline (CNA, 2003). Nurses must recognize the importance of prompt referrals and timely communication with other care

providers. Inclusion of professionals from various disciplines in practice projects, in-service programs, conferences, and staff meetings fosters interprofessional collaboration. Learning the skills and knowledge for interprofessional practice begins in nursing education, and student nurses are encouraged to seek practicum and other opportunities that allow them to work with other professionals and providers and articulate nursing's unique role and contribution to practice.

Staff Communication. Communication with staff is one of the manager's greatest challenges, especially in a large work group in which change is constant. It is difficult to ensure that all staff members receive the correct messages. In the current health care environment, staff quickly become uneasy and distrusting if they fail to hear about planned changes in their work unit. A manager cannot be responsible for all communication but can use several approaches to communicate quickly and accurately with all staff: increasing presence on work units, circulating newsletters, posting minutes of committee meetings, and using list servers and e-mail. Of most importance is that staff members have the opportunity to meet and to discuss issues pertinent to their role and ability to provide care. Professional councils must be valued and invited to provide advice on emerging issues.

Developing a Learning Organization. Nurses must continually update their knowledge and incorporate best practices that are evidence informed (Cullum et al., 2008). Leaders and managers are challenged to develop the conditions for learning to flourish in what has been described as a *learning organization* (Senge, 2006). In learning organizations, many forms of knowledge are shared. Leadership strategies are needed to help nurses incorporate evidence-informed best practice guidelines into their nursing practice. These strategies include "support, role-modelling commitment to best practices and reinforcing organizational policies and goals consistent with evidence based care" (Gifford et al., 2006, p. 73). Technology such as Web-based applications and social media will continue to transform how we learn and communicate in organizations requiring attention to ethical issues such as privacy and confidentiality, as well as the power of the media for influencing change in systems (Aylott, 2011; Mostaghimi & Crotty, 2011; Smith, 2012). These influences will require both vigilance and ethical consideration of managers and leaders.

Clinical Care Coordination

As a nursing student, you develop the skills necessary to ensure timely and effective patient care. At first, you may have only one patient, but eventually you will coordinate the care of groups of patients. Clinical care coordination includes decision making, priority setting, use of organizational skills and resources, time management, and evaluation.

Clinical Decisions. Leadership and decision-making skills are required as the nurse engages in the complex interactions—collaboration, negotiation, conflict resolution, and delegation—necessary to elicit the involvement of other people. You learn to value and practise patient centredness in every interaction. You will adopt a critical thinking approach, applying understanding of patients' perspectives, your knowledge, evidence-informed best practice guidelines, and experience to the decision-making process (see Chapter 11).

Priority Setting. You must establish priorities of care as they relate to actions taken to meet patients' needs. This is particularly important in caring for groups of patients with health challenges involving immediate needs and actions to be

taken. Hendry and Walker (2004) classified patient problems in three priority levels on the basis of the time frame in which you must act:

- *High (first-order) priority:* An immediate threat to a patient's survival or safety, such as a physiological episode of obstructed airway, loss of consciousness, injury, or an anxiety attack.
- *Intermediate (second-order) priority:* Nonemergency, non-life-threatening actual or potential needs that the patient and family members are experiencing, such as anticipating teaching needs of patients with regard to a new drug, wound care, or measures to decrease falls among older adults.
- *Low (third-order) priority:* Actual or potential problems that may or may not be directly related to the acute phase of the patient's health challenge. This means that they are not as time sensitive; however, they should be viewed as important to the health outcomes over the slightly longer term. Examples include promoting family members' understanding of a diabetic diet or other aspects of chronic illness management.

Many patients can have all three types of priorities, which requires you to use careful judgement in choosing a course of action. First-order priority needs require your immediate attention and, most often, immediate assistance in meeting these needs. Setting priorities also requires that you know the priority needs of each patient, assessing each patient's needs as soon as possible, including the patient and family determination of priorities, and addressing needs in a timely manner (Wywiałowski, 2004). You consider resources, recognize that priority needs can change, and use your time wisely.

Time Management. Changes in health care delivery and increasing complexity in all settings of care can create time management challenges for nurses as they work to meet patients' needs (Marriner Tomey, 2004). Time management skills can help you manage stress. These skills include reflecting on how you use time, planning effectively, and being aware of competing priorities. Because of the complexity of practice, nurses are often required to juggle priorities and respond to multiple demands on their time. It is therefore most important to track these demands and ensure that resources are in place that allow you to focus on priorities in a timely manner. Technology such as e-mail correspondence has increased demands on nurses' time and often require immediate responses. It is therefore important for you to realize and reflect on the impact of technology and other forces and to acquire the ability to set limits and refuse demands that are unreasonable.

Evaluation. Evaluation is one of the most important aspects of clinical care coordination. Evaluation is an ongoing process that provides focus and direction for each phase of nursing care. Once you begin to provide care, you should also learn to immediately evaluate its effectiveness and the patient's response. In the evaluation process, you compare expected patient outcomes with actual outcomes. For example, a clinic nurse assesses a diabetic patient's foot ulcer to determine whether healing is progressing and expected outcomes are met. Evaluation reveals the need to revise approaches to care and introduce new therapies. Focusing on evaluation of a patient's progress and outcomes, rather than on tasks, lessens the chance of distraction. You learn to keep the patient at the centre of the care by asking the patient for his or her ideas and evaluation of how he or she is experiencing the care plan.

Delegation. Changes in staff mix have resulted in more UCPs delivering care to patients (CNA, 2008; McGillis Hall,

2004). In the new working environment, a nurse must understand the evolving role of nursing and delegated care responsibilities in order to ensure the safety and quality of nursing care delivery. **Delegation** refers to the transferring of responsibility for the performance of an activity or task while retaining accountability for the outcome (College of Registered Nurses of British Columbia, 2005). Delegated tasks are those that are outside of the role description of the UCP. As a student, you will work with teams of nurses and UCPs during your practica in many health care settings, including home care, residential care, community health care, and acute care settings. As you develop in your role, it is important to learn about the roles and scopes of practice of UCPs in different practice settings. You will learn about how your role relates to that of the UCP and how the principles of delegation are applied in practice. Students and nurses also have access to valuable resources such as nursing practice consultants and practice guidelines to assist them in making complex decisions about delegation. The nurse may also assume responsibility for the education, supervision, and support of UCPs as they perform delegated nursing activities (Box 10-7).

Provincial regulations define the scope of an RN's practice, including activities that only RNs can perform (e.g., patient assessment and planning care). Although most provinces identify the delegation and supervision of work as an RN's responsibility, each province addresses the specifics of delegation differently. In Ontario, British Columbia, and Alberta, for example, legislation that applies to all regulated health care

providers identifies specific tasks or activities that can be performed by only certain providers. In British Columbia, these authorized tasks are known as *reserved acts*; in Ontario, they are called *controlled acts*; and in Alberta, they are known as *restricted activities*. UCPs are not allowed to perform actions authorized for RNs unless those actions have been properly delegated by an RN and only if they are within the UCP's job description and employer policy (Sorrentino, 2009).

An institution's policies, procedures, and job descriptions for UCPs provide specific guidelines regarding which tasks or activities can be delegated. The job description should specify any required education and the types of tasks UCPs can perform, either independently or under an RN's direct supervision. Institutional policy helps in defining the amount of training required of UCPs while they are employed. Procedures specify who is qualified to perform a given nursing procedure, whether supervision is necessary, and the type of reporting required. Job descriptions, policies, and procedures should comply with provincial laws and regulations. Nurses should have a means of accessing policies easily or have supervisory staff who can inform them about the UCP's job duties.

Effective delegation requires trust between the RN and UCPs. It also requires constant communication: sending clear messages and listening so that all participants understand expectations regarding patient care. An RN should provide clear instructions when delegating tasks. These instructions may initially focus on the procedure itself, as well as on the unique needs of the patient. As the RN becomes more familiar with a staff member's scope of practice, trust builds and fewer instructions may be needed, but clarification of patients' specific needs is always necessary.

A key step in delegation is evaluation of the staff member's performance and the patient's outcomes. When UCPs do a good job, it is important to provide praise and recognition. If the staff member's performance is unsatisfactory, the RN must give constructive feedback, specifically discussing mistakes and how they could have been avoided. Giving feedback in private in a professional manner preserves the staff member's dignity. A UCP may fail to meet expectations because of inadequate training or assignment of too many tasks. The RN may need to review or demonstrate a procedure with staff or schedule additional training with the education department. The delegation of too many tasks might be a nursing practice issue. All staff should discuss delegation on their unit because UCPs may need help in learning how to prioritize and RNs may need to ensure that they are not overdelegating.

A few tips for nurses on appropriate delegation (College of Registered Nurses of British Columbia, 2006; Keeling et al., 2000) follow:

- *Assess the knowledge and skills of the delegate.* Nurses should determine what the UCP knows and what he or she can do by asking open-ended questions that will elicit conversation and details; for example, "Can you tell me what you would observe in Mr. S when you visit him today that would alert you to call me immediately?"
- *Match tasks to the delegate's skills.* Nurses need to know what skills are included in the UCP training program at their facility and to determine whether personnel have learned critical thinking skills, such as knowing the difference between normal clinical findings and changes to report.
- *Communicate clearly.* Nurses should provide unambiguous directions by describing a task, the desired outcome, and the time period for completion of the task. Rather than

► BOX 10-7 The Five Rights of Delegation

Right Task

The right task is one that can be delegated for a specific patient, such as tasks that are repetitive, require little supervision, and are relatively noninvasive (bathing, toileting, feeding, some oral medication administration, positioning, and assisting with mobility).

Right Circumstances

The appropriate patient setting, available resources, and other relevant factors are considered. In an acute care setting, patients' conditions can change quickly. Good clinical decision making is needed to determine what to delegate.

Right Person

The right person (e.g., the nurse) is delegating the right tasks to the right person (e.g., the UCP) to be performed on the right person (the correct patient).

Right Direction or Communication

A clear, concise description of the task, including its objective, limits, and expectations, is given. Communication must be ongoing between RN and UCPs during a shift of care.

Right Supervision

Appropriate monitoring, evaluation, intervention as needed, and feedback are provided. UCPs should feel comfortable asking questions and seeking assistance.

Modified from National Council of State Boards of Nursing. (1995).

Delegation: Concepts and decision-making process. Chicago: Author; National Council of State Boards of Nursing. (1997). *The five rights of delegation.* Chicago: Author; and American Nurses Association (ANA) and National Council State Boards of Nursing. (2006). *Joint statement on delegation.* Retrieved from http://www.ncsbn.org/pdfs/joint_statement.pdf.

giving instructions through another staff member, nurses should make the delegate feel part of the team. For example, "I'd like you to help me by getting Mr. Floyd up to ambulate before lunch. Be sure to check his blood pressure before he stands and write your finding on the graphic sheet. Okay?"

- *Listen attentively.* Nurses should listen to the UCP's responses as they give directions. Is the UCP comfortable asking questions or requesting clarification? Nurses need to be especially attentive if the UCP has a deadline assigned by another nurse and to help sort out priorities.
- *Provide feedback.* Nurses should give feedback about performance, regardless of outcome. They must tell the person about a job well done or, if an outcome is undesirable, find a private place to discuss what occurred, any miscommunication, and how to achieve a better outcome in the future.

Quality Care and Patient Safety

As discussed throughout this chapter, safe and high-quality care is delivered when leadership, staffing models, and collaborative practice are in place to support it. Studies reveal that high-quality practice environments produce better patient outcomes and more satisfied patients and staff (Aiken et al., 2001, 2002; CNA, 2008; Tourangeau et al., 2002). Initiatives such as the College of Nurses of Ontario's (2004) *Quality Assurance Practice Consultation Program* and the Registered Nurses Association of British Columbia's (2003) *Quality Practice Environment Program* assess organizational attributes that enhance practice. The assessment is voluntary, but response by health care agencies is encouraging.

Organizational programs such as total quality management (TQM) and continuous quality improvement (CQI) were developed to encourage staff to reflect on how to improve work. In quality management, the patient's or customer's definition of quality is recognized (Wendt & Vale, 2003). Most organizations have moved away from programs identified as TQM or CQI and focus on the more generic and pervasive concept of **quality improvement (QI)**, defined by the Canadian Council on Health Services Accreditation (2003) as "an organizational philosophy that seeks to meet clients' needs and exceed their expectations by using a structured process that selectively identifies and improves all aspects of service" (p. 1). This council describes quality as responsiveness, system competency, patient or community focus, and work life. QI focuses on improving organizational performance related to processes.

Quality in Nursing Practice

Quality Defined. Standards or guidelines define the meaning of quality. For example, to judge whether rehabilitation has been delayed, a standard of when rehabilitation should begin must exist. Quality of care in nursing practice is not arbitrarily defined. A definition of quality begins with the mission, vision, philosophy, and values of the nursing department. These statements define how all nurses within an organization are to perform and which services must be provided. Written values give direction for professional standards and care guidelines that lead to positive patient outcomes.

Professional Standards. Professional standards are authoritative statements used by the profession in describing the responsibilities for which its practitioners are accountable (Peters, 1995). They include the policies and position descriptions that identify performance expectations within an

organization. Standards are an organization's interpretation of the professional's competency. The adherence to professional standards is measured through professional outcomes.

Care and Best Practice Guidelines. Care guidelines encompass best practice guidelines, which are statements to assist in providing care according to the best evidence available (RNAO, 2003). Guidelines can be developed by single disciplines or can be multidisciplinary in focus. Examples of nursing practice guidelines are found on the RNAO Web site encompassing some of the examples referred to in this chapter, including wound care and prevention of falls. The effectiveness of nursing practice is measured through patient outcomes and the accumulation of evidence (Graham & Harrison, 2008).

Nurse-Sensitive Outcomes. Outcomes are conditions to be achieved as a result of care. It is important that the outcomes selected to measure the effectiveness of nursing care are related to the work that nurses do. A **nurse-sensitive outcome** reveals whether interventions are effective, whether patients progress, how well standards are being met, and whether changes are necessary. Examples of outcomes related to the implementation of best practice guidelines may include incidence of pressure sores, falls in elderly patients, and hypertension control measures.

To judge whether standards of care are met, processes and outcomes are measured. For example, a staff measures its success in implementing a new process of diabetes instruction and also measures the outcome: Can patients administer insulin correctly? When selecting quality indicators, teams should consider processes and related outcomes that are most likely to improve nursing practice. Processes to improve may include the following:

- A weak process that is causing problems (e.g., poor pain management for patients with cancer who are at home)
- A stable process that is adequate but can improve (e.g., access to education and support for people with diabetes in rural communities)
- A process linked to negative outcomes (e.g., care of intravenous access sites with the occurrence of phlebitis)

Building a Culture of Safety

Patient safety has been recognized as a crucial component of health care delivery. The Canadian Patient Safety Institute (2009) defined patient safety as "the reduction and mitigation of unsafe acts within the health care system, as well as through the use of best practices shown to lead to optimal patient safety." Issues such as staff shortages, new technology, and other demands on health care systems have prompted a re-examination of how errors and adverse events for patients can be prevented. Increasingly, the emphasis is on enabling health care providers to communicate effectively and to acknowledge and receive timely assistance for errors. This assistance includes the education of nursing and other health care students to view mistakes as learning, to know and prevent conditions that lead to unsafe practices, and to develop the **competencies for safe practice** (Canadian Association of Schools of Nursing, 2006; Davidson et al., 2006). The Canadian Patient Safety Institute (2009) identified seven core domains of abilities for all health care providers, including their contributions to developing a culture of patient safety as a most important foundation (Box 10-8).

Coming Full Circle: Leadership for a High-Quality Work Life and High-Quality Health Care. Leaders and managers at all levels of health care organizations must do

► BOX 10-8 The Safety Competencies

Domain 1: “Creating a Culture of Patient Safety” (<http://www.patientsafetyinstitute.ca/English/toolsResources/safetyCompetencies/Documents/Safety%20Competencies.pdf>)

Health care professionals must be enabled to contribute to health care organizations, large or small, in ways that promote patient safety in their structure and function. Content in this domain could include but is not limited to the following aspects:

- Understanding of patient safety concepts, epidemiology, and basic theories
- Awareness of health care error
- Promotion of a systems approach to care and safety
- Promotion of staff empowerment to resolve unsafe situations
- Role modelling and demonstration of a commitment to leadership in safe practice
- Ensuring feedback on safety issues
- Integration of safe practices into daily activities
- Commitment to communication, teamwork, and quality
- Reporting of adverse events
- Commitment to a just, nonpunitive culture (Canadian Patient Safety Institute, 2009)

what they can to improve the quality of work life in health care in order to ensure patient safety and quality health care; evidence and awareness of this need are growing. A forward thinking and exciting partnership of 10 leading health care organizations in Canada, including the CNA and the Canadian Council on Health Services Accreditation (now known as “Accreditation Canada”), have formed the Quality Worklife-Quality Healthcare Collaborative (QWQHC) with the mandate and a guiding conceptual framework to “improve the health of health workplaces” (QWQHC, n.d.) The foundational belief of the QWQHC is that “a fundamental way to better healthcare is through healthier health care workplaces; it is unacceptable to work in, receive care in, govern, manage and fund unhealthy workplaces” (QWQHC, n.d.).

Nurse fatigue has been identified as a current factor in patient safety requiring the attention of governments, organizations, and individual nurses (CNA & RNAO, 2010). Recommended solutions to the problem based on research include the role of nurse managers in instituting fatigue management policies and programs. These measures require significant changes in the workplace and collaboration with nursing unions and nursing education programs. Measures to be considered include rest and sleep policies, as well as reform of scheduling practices (CNA & RNAO, 2010). Nurse managers have significant responsibilities in implementing these solutions, and they provide leadership in this area to make a difference to both the quality of nurses’ work lives and patient safety outcomes.

Leadership Skills for Nursing Students

Nursing students prepare for leadership roles. This does not mean you must quickly learn how to lead a nursing team; rather, you first learn to become an accountable and competent health care provider. Leadership development is ongoing throughout a career, and individual leadership styles are influenced from a variety of sources, including theories, best

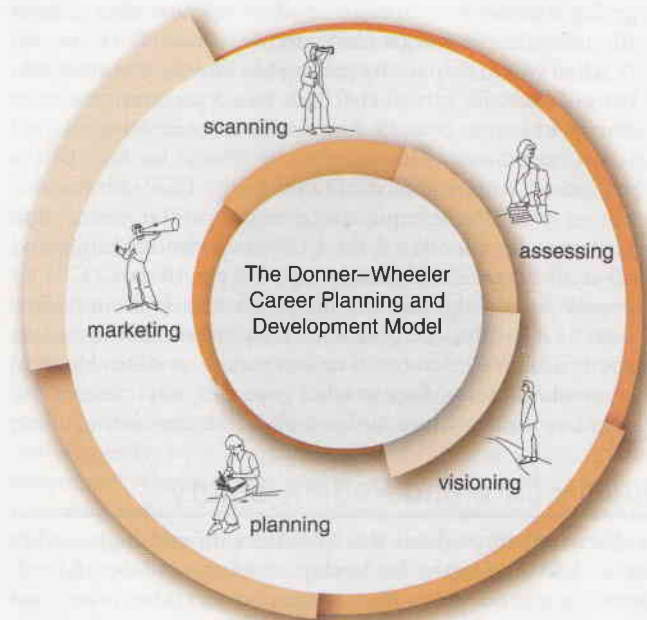


Figure 10-4 The Donner-Wheeler Career Planning and Development Model **Source:** Waddell, J., Donner, G. J., & Wheeler, M. M. (2009). *Building your nursing career: A guide for students* (3rd ed., p. 2). Toronto: Elsevier Canada.

practices, mentors, role models, and experiences. You learn leadership by making good clinical decisions, advocating for public health and quality care, learning from mistakes, seeking guidance, engaging in collaborative practice with nursing teams and other professionals, seeking mentors, and striving to improve during each patient interaction. Recent research in Canada has indicated that mentorship components of new graduate transition programs are key to helping new graduate nurses become part of the nursing workforce (Baumann et al., 2011). Your nursing education program provides you with the opportunity to develop leadership competencies: advocacy, conflict management, collaborative practice, patient centredness, delegation, and evidence-informed decision making.

Career Development and Mentoring for Nursing Students

Nursing students have the opportunity to begin to envision their preferred career path early in their nursing education program. In fact, it is likely that students who do begin to plan their careers or “course of life work” are more likely to achieve their goals and develop personal and professional strengths that enable their future career satisfaction and success (Waddell et al., 2009). As you develop a career vision, you may identify opportunities that can further your development as a nurse leader, such as attending meetings of professional associations, presenting your work at student conferences, and finding a career coach or mentor (Cooper & Wheeler, 2010; Mata et al., 2010). Waddell et al. (2009) have developed the Career Planning and Development Model for students to use during their nursing education program (Figure 10-4). The model includes stages of planning that engages the student in learning about nursing realities and trends, developing a self-assessment, and creating a career vision and marketing approach. These authors contend that having a career vision is “perhaps the most

BOX 10-9

NURSING STORY

Leadership for Best Practices in Falls Prevention

Kaley Hart is a recently graduated RN working in a residential care facility. Ann Best, the nurse manager of the facility, is aware of Kaley's interest in leadership for best practices. As a fourth-year student, Kaley had completed a special project on falls prevention in the facility, using local statistics on falls and evidence-informed practice guidelines. Ann wishes to enroll the long-term care facility in the National Collaborative on Falls in Long-Term Care (RNAO, 2007b). This program requires the commitment of an improvement team consisting of five to seven staff members. Ann's vision is that the improvement team would be supported by the educational and research resources of this national program and by access to national experts in falls prevention. She sees this as an excellent opportunity for Kaley to be involved and to continue to develop her leadership skills in the areas of collaborative practice and best practices implementation.

At Ann's invitation, Kaley becomes involved with the quality improvement team, which also includes a nurse researcher from the university. Kaley begins her work by inspiring other nurses to become involved with the initiative, and she advocates for UCOs and other professionals to become members of the team in order to achieve a broad perspective on the changes required to prevent falls. She refers to the Canadian statistic that 50% of elderly residents in nursing homes fall every year (RNAO, 2007b), which results in a negative impact on their quality of life and increased costs to the health care system. Kaley inspires a vision of changes to be made in the interest of preventing falls and achieving the best possible health outcomes for the residents in the facility. She advocates for residents' and their families' involvement in the initiative

and seeks input from all patients and professionals as to how the learning sessions should take place, in order to promote engagement as a learning community.

As a member of the team, Kaley contributes her knowledge of the RNAO (2007a) *Falls Prevention Best Practices Guidelines* and helps develop a practical approach to identifying residents who are at risk for falls. Drawing on her knowledge of collaborative practice, Kaley ensures that other members, including the physiotherapist, UCP, recreation therapist, nutritionist, and housekeeping manager, are able to contribute their experiences and ideas about risk management and participate in the learning sessions. Kaley takes the opportunity to praise the contributions of diverse team members and to facilitate input and participation from the residents.

An evaluation of the quality improvement team reveals high levels of participation and interest within the facility. The experience of being involved in a national initiative has contributed to the capacity for best practices implementation and evidence-informed practice. Kaley has been inspired by the experience and has further developed her management and leadership competencies in the areas of inspiring a vision, leading change, facilitating collaborative practice, and developing respectful and supportive relationships among team members. She has worked with the nurse researcher at the local university to develop the plan for studying the impact of the changes on the incidence of falls, over time. Of most importance is that Kaley looks forward to the next opportunity to make a difference in the health outcomes of the residents through the exercise of progressive management and leadership initiatives.

forceful motivator for using your nursing practice placement and classroom experiences and your summer and part-time work opportunities to the fullest" (2009, p. 7).

Transformational leadership, including the concepts and competencies discussed in this chapter, is needed to shift the current culture of health care to achieve the vision of health care providers delivering high-quality health care, adopted by the collaborative. This means that nurses and other professionals working directly with patients and the mid-level managers have key roles to play in leading change. They must be inspired and supported through mentoring and by the implementation of leadership best practices guidelines and collaborative practice. Senior leaders must ensure adequate staffing and support for the culture of a healthy workplace. The way forward is to inspire lifelong learning at all levels of the organization and provide access and resources to education that enables staff to work with the patient and the patient's family at the centre of health care delivery and decision making.

Nurses working at all levels of organizations can contribute by making a commitment to this vision and being part of the change that is required to transform Canadian health care. Indeed, the CNA in its centenary year inspires the theme of leadership for a transformed Canadian health care system and calls for Canadian nurses to "be the change" required to sustain quality health care for all. As a student and as a qualified nurse, you have the opportunity and the challenge to effect positive change in nursing practice and Canadian health care (Box 10-9).

❖ KEY CONCEPTS

- A leader must set a vision or philosophy for a work unit, ensure appropriate staffing, mobilize staff and institutional resources to achieve objectives, motivate staff members to carry out their work, set standards of performance, and make the right decisions to achieve objectives.
- Management and leadership are related processes; both are essential to nursing practice and health care delivery.
- Healthy practice environments are essential to quality nurse and patient care outcomes.
- Transformational leadership that emphasizes relationships, trust, and vision plays a key role in ensuring healthy practice environments.
- An empowered nursing staff has decision-making authority to change how they practise.
- Nursing care delivery models vary by the responsibility of the RN in coordinating care delivery and the roles other staff members play in assisting with care.
- Continuity of nursing care can be compromised in total patient care delivery, functional nursing practice, and team nursing.
- Best practice guidelines are evidence informed and contain recommendations for developing and sustaining collaborative practice models and leadership.
- For decentralized decision making to succeed, staff members must be aware that they have the responsibility, authority, autonomy, and accountability for the care they give and the decisions they make.

- A nurse manager can foster decentralized decision making by establishing nursing practice committees, supporting collaborative practice, implementing quality improvement plans, and maintaining timely staff communication.
- Clinical care coordination involves accurate clinical decision making, establishing priorities, efficient organizational skills, appropriate use of resources and time management skills, and an ongoing evaluation of care activities.
- To promote an enriching professional environment, each member of a nursing work team is responsible for open, professional communication.
- Delegation involves transferring responsibility for performing an activity while retaining accountability for the outcome.
- When accomplished correctly, delegation can improve job efficiency and job enrichment.
- An important responsibility for the nurse who delegates nursing care is evaluation of the staff member's performance and patient outcomes.
- In a quality improvement-oriented environment, every staff member becomes involved in finding ways to improve or change work processes so as to promote patient safety and quality care outcomes.
- The QWQHC was developed to transform Canadian health care delivery systems.
- Nurses' **career development** involves planning and opportunities for mentorship.

✦ CRITICAL THINKING EXERCISES

1. John, an RN, is working with Tammy, a UCP, to manage care for five patients. John has completed morning assessments and rounds on the assigned patients and is giving Tammy directions for what she needs to do in the next hour. John says to Tammy, "Why don't you go to Room 415 and see what Mr. Thomas needs, and go to Room 418 to check if Mrs. Landry is doing all right." Based on what you know about delegation, were these appropriate or inappropriate delegations to Tammy? Provide a rationale for your answer.
2. You are a recently graduated RN working in a home care setting. The manager of the nursing program asks you to assist with the implementation of a collaborative practice model. She asks you to help her set the agenda for the first meeting to discuss the concept and principles of collaborative practice. What ideas and resources would you contribute to the agenda?
3. You have just received morning shift reports on your patients. You have been assigned the following patients:
 - A 52-year-old man who was admitted yesterday with a diagnosis of angina. He is scheduled for a cardiac stress test at 0900.
 - A 60-year-old woman who was transferred out of intensive care at 0630 today. She underwent uncomplicated coronary bypass surgery yesterday.
 - A 45-year-old man who experienced a myocardial infarction three days ago and is complaining of chest pain, which he rates as 5 on a scale of 0 to 10.
 - A 76-year-old woman who had a permanent pacemaker inserted yesterday and is complaining of incision pain, which she rates as 7 on a scale of 0 to 10.

Which one of these patients do you need to see first? Explain your answer.

✦ REVIEW QUESTIONS

1. Transformation leadership most fundamentally involves
 1. Developing charismatic and highly influential leaders
 2. Envisioning new systems of care to get work done
 3. Developing relationships and involving others in change
 4. Introducing research and innovation
2. Collaborative practice models aim to
 1. Improve delegation between staff
 2. Improve communication between staff
 3. Place the patient at the centre of care delivery
 4. Ensure that health care providers can cover for one another
3. The type of care management approach that coordinates and links health care services to patients and their families while streamlining costs and maintaining quality is
 1. Case management
 2. Total patient care
 3. Functional nursing
 4. Primary nursing
4. The type of management structure that has a potential for greater collaborative effort, increased competency of staff, and ultimately a greater sense of professional accomplishment and satisfaction is
 1. Case management
 2. Primary nursing
 3. Total patient care
 4. Decentralized
5. While administering medications, the nurse realizes she has given the wrong dose of medication to a patient. The nurse acts by completing an incident report and notifying the patient's physician. The nurse is exercising
 1. Authority
 2. Responsibility
 3. Accountability
 4. Decision making
6. A manager who wishes to improve patient safety in the health care organization should focus on
 1. Problem-solving committees
 2. Staffing models and ratios
 3. Systems for reporting mistakes
 4. Staff communication
7. A home care nurse is working with three UCPs who were recently hired and are new to their roles. For the first two weeks of their employment, the UCPs have been providing care for patients at home with complex wounds and caring for families in palliative care situations. The nurse believes in the principles of collaborative practice and wishes to support the UCPs in their development. An important first step would be to
 1. Provide an opportunity for the UCPs to talk about their experiences, questions, and roles
 2. Provide an educational session on palliative care
 3. Set up a mentoring system among the UCPs
 4. Discuss the role of the RN in home care

8. A patient is experiencing an anxiety attack. This is which priority nursing need for this patient?
 1. First-order priority
 2. Second-order priority
 3. Third-order priority

9. The nurse checks on a patient who was admitted to the hospital with pneumonia. He has been coughing profusely and has required nasotracheal suctioning. He has an intravenous infusion of antibiotics. He is febrile. The patient asks the nurse whether he can have a bath because he has been perspiring profusely. The nurse may delegate to the UCP working with her today the task of
 1. Assessing vital signs
 2. Changing intravenous dressing
 3. Nasotracheal suctioning
 4. Administering a bed bath

10. An example of a nurse-sensitive outcome based on best practice guidelines is
 1. Rates of emergency room readmission after postsurgical discharge
 2. Percentage of time it takes to count narcotics by nursing staff every shift
 3. Number of falls among residents in a long-term care setting
 4. Time it takes for a patient to be transported from the emergency department to an inpatient nursing unit

✦ RECOMMENDED WEB SITES

Academy of Canadian Executive Nurses (ACEN): <http://www.acen.ca>

This is an association of nurses in leadership positions across the spectrum of health services. ACEN activities support leadership, advocacy and policy initiatives, and mentorship for emerging nurse leaders and executives.

Accreditation Canada: <http://www.accreditation.ca/en/>

Accreditation Canada, formerly known as the Canadian Council on Health Services Accreditation, is a national, nonprofit, independent organization whose role is to help health services organizations, across Canada and internationally, examine and improve the quality of care and service they provide to their patients.

Canadian Association of Schools of Nursing (CASN): <http://www.casn.ca>

The Canadian Association of Schools of Nursing (CASN) is the national voice for nursing education, research, and scholarship and represents baccalaureate and graduate nursing programs across Canada.

Canadian Health Services Research Foundation: <http://www.chsrf.ca>

The Web site of the Canadian Health Services Research Foundation contains research resources for policymakers and for health system leaders and managers pertaining to staffing models, high-quality health work life, and high-quality health care.

Canadian Interprofessional Health Collaborative: <http://www.cihc.ca>

The Canadian Interprofessional Health Collaborative (CIHC) is made up of health organizations, health educators, researchers, health professionals, and students across Canada. This

collaborative shares best practices and advances knowledge in interprofessional practice and collaborative practice.

Canadian Nurses Association (CNA): <http://www.cna-nurses.ca/cna>

The CNA is a federation of 11 provincial and territorial nursing associations representing more than 120,000 RNs. The CNA's mission is to advance the quality of nursing in the interest of the public.

Canadian Nursing Students Association (CNSA): <http://www.cnsa.ca/>

The CNSA is the national voice of nursing students in Canada. For more than 30 years, the CNSA has represented the interests of nursing students to federal, provincial, and international governments and other nursing and health care organizations.

Canadian Patient Safety Institute: <http://www.patient-safetyinstitute.ca/>

The Canadian Patient Safety Institute (CPSI) is an independent not-for-profit corporation, operating collaboratively with health providers and organizations and with regulatory governments and bodies to build and advance a safer health care system for Canadians.

Donnerwheeler: <http://www.donnerwheeler.com>

This Web site includes information and resources for career development and mentoring, developed by Canadian nurse leaders Gail Donner and Mary Wheeler.

International Council of Nurses (ICN): <http://www.icn.ch/>

The ICN is a federation of national nurses' associations, representing nurses in more than 120 countries. Operated by nurses for nurses, ICN works to ensure quality nursing care for all patients, sound health policies globally, and the advancement of nursing knowledge.

Interprofessional Rural Program of BC (IRPbc): <http://www.irpbc.com/>

The IRPbc offers a unique opportunity for students from various health care provider programs to experience life and work in a rural community in British Columbia and to participate in a number of interprofessional team activities. The Web site offers access to a 10-minute film, *Learning Together in Rural Communities*, which highlights the voices of the students about their experiences.

Registered Nurses' Association of Ontario (RNAO): <http://www.rnao.org>

This Web site offers a complete and up-to-date inventory of best practice guidelines, including implementation and evaluation.

Quality Worklife-Quality Healthcare Collaborative (QWQHC): <http://www.qwqhc.ca/>

This Web site describes the national interprofessional coalition of health care leaders who work together to develop an integrated action-oriented strategy to transform the quality of work life for Canada's health care providers. According to the QWQHC, this strategy enables patient safety and high-quality patient care and system outcomes.

Review Question Answers

1. 3; 2. 2; 3. 3; 4. 4; 5. 3; 6. 2; 7. 1; 8. 1; 9. 4; 10. 3

Rationales for the Review Questions appear at the end of the book.

Critical Thinking in Nursing Practice

Original chapter by Patricia A. Potter, RN, MSN, PhD, FAAN

Canadian content written by Donna M. Romyn, RN, PhD

objectives

Mastery of content in this chapter will enable you to:

- Define the key terms listed.
- Describe characteristics of a critical thinker.
- Describe the components of a critical thinking model for clinical decision making.
- Explain the relationship between clinical experience and critical thinking.
- Discuss critical thinking competencies used in nursing practice.
- Discuss the nurse's responsibility in making clinical decisions.
- Discuss the relationship of the nursing process to critical thinking.
- Discuss the critical thinking qualities used in clinical decision making.
- Explain how professional standards influence a nurse's clinical decisions.
- Describe how reflective journal writing promotes critical thinking.
- Discuss how concept maps can improve a nurse's ability to think critically.

key terms

Clinical decision-making process, p. 141
 Clinical inference, p. 145
 Concept map, p. 149
 Critical thinking, p. 141
 Decision making, p. 145
 Diagnostic reasoning, p. 145

Evidence-informed knowledge, p. 141
 Nursing process, p. 142
 Problem solving, p. 145
 Reflection, p. 148
 Reflective journal writing, p. 148
 Scientific method, p. 144

media resources

evolve WEBSITE

<http://evolve.elsevier.com/Canada/Potter/fundamentals/>

- Audio Chapter Summaries
- Examination Review Questions
- Glossary
- Student Learning Activities
- Weblinks

As a nurse, you will face many complex situations involving patients, family members, and other health care workers. To deal with these experiences effectively, you need to develop sound critical thinking skills so that you can approach each new problem involving a patient's care with open-mindedness, creativity, confidence, and wisdom. When a patient develops a new set of symptoms, asks you to provide comfort, or requires a procedure, it is important to think critically and make prudent clinical judgements so that the patient receives the best nursing care possible. Critical thinking is not a simple, step-by-step linear process that you can learn overnight. Your ability to think critically will increase as you gain experience and progress from novice to expert nurse (Benner, 1984). Critical thinking is central to professional nursing practice because it allows you to test and refine nursing approaches, learn from successes and failures, apply new knowledge (e.g., nursing research findings), and ensure holistic patient-centred care.

Critical Thinking Defined

Critical thinking is a complex phenomenon that can be defined as a process and as a set of skills. Most definitions of critical thinking emphasize the use of logic and reasoning (Di Vito-Thomas, 2005) to make accurate clinical judgements and decisions. Accordingly, nurses recognize that an issue (e.g., patient problem or health-related concern) exists, analyze information about the issue (e.g., clinical data about the patient), evaluate information (e.g., review assumptions and evidence), and draw conclusions (Settersten & Lauver, 2004). In consultation with patients, nurses consider what is important in a situation, imagine and explore alternative solutions, consider ethical principles, and then make informed decisions about how to proceed. Consider the following case example:

Mr. Jacobs is a 58-year-old patient who had a radical prostatectomy for prostate cancer yesterday. His nurse, Tonya, finds him lying supine in bed with his arms extended along his sides and his hands clenched. When Tonya checks his surgical wound and drainage device, she notes that he winces when she gently palpates over the incisional area. She asks Mr. Jacobs when he last turned onto his side, and he responds, "Not since sometime last night." Tonya asks Mr. Jacobs if he is having incisional pain and he nods, saying, "It hurts too much to move." Tonya considers her observations and the information she has learned from the patient to determine that his pain is severe and his mobility is reduced because of it. Together, she and Mr. Jacobs decide to take action to relieve Mr. Jacob's pain so he can turn more frequently and begin to get out of bed to aid his recovery.

Critical thinking requires purposeful and reflective reasoning during which you examine ideas, assumptions and beliefs, principles, conclusions, and actions within the context of the situation (Brunt 2005a, 2005b). When you care for a patient, you begin to think critically by asking questions such as "What do I know about the patient's situation?" "How do I know it?" "What is the patient's situation now? How might it change?" "What else do I need to know to understand this situation better or improve it? How can I obtain that information?" "In what way will a specific therapy affect the patient?" "Are other options available?" By answering these questions, you are able to identify alternative solutions to resolve the patient's health-related concerns.

As you gain experience in nursing, avoid letting your thinking become routine or standardized. Instead, learn to look beyond the obvious in any clinical situation, explore the patient's unique responses to actual or potential health alterations, and recognize what actions are needed to benefit the patient. Over time, your experience with many patients will help you recognize patterns of behaviour (Tanner, 2006), see commonalities in signs and symptoms, and anticipate reactions to nursing interventions. Reflecting on your experiences will allow you to better anticipate patients' needs and recognize problems when they develop. It will also help you determine how the knowledge you gained working with one patient may be applicable to another patient's situation.

In Tonya's case, she knows that the patient is likely to have pain because the surgery was extensive. Her review of her observations and the patient's report of pain confirm that pain is a problem. Her options include giving Mr. Jacobs an analgesic and then waiting until it takes effect so that she can help him find a more comfortable position. Once his pain is less acute, Tonya might also ask Mr. Jacobs

whether he would like to try some relaxation exercises and mobilization techniques she learned while caring for another postoperative patient that may be effective in increasing his mobility.

You can begin to learn to think critically early in your practice. For example, as you learn about administering bed baths and other hygiene measures to your patients, take time to read this book and the nursing literature about the concept of comfort. What are the criteria for comfort? How do patients from other cultures perceive comfort? What are the many factors that promote comfort? Learning and thinking critically about the concept of comfort, in addition to acquiring the skills needed to provide comfort measures, prepares you to better anticipate your patients' needs. You will also identify comfort problems more quickly and offer appropriate care. The use of **evidence-informed knowledge**—knowledge based on research or clinical expertise—makes you an informed critical thinker.

Critical thinking requires not only cognitive skills, such as interpretation, analysis, inference, evaluation, explanation, and self-regulation, but also a nurse's habit (disposition) to ask questions, to be well informed, to be honest in facing personal biases, and to always be willing to reconsider and think differently about issues. Without these dispositions, sound critical thinking is unlikely to occur (Facione, 1990; Facione & Facione, 1996; Profetto-McGrath, 2003). When applied to nursing, these core critical thinking skills and critical thinking dispositions reveal the complex nature of the **clinical decision-making process** (Table 11-1). Being able to apply all of these skills and acquiring all of these critical thinking habits take time and practice. You also need to have a sound knowledge base and thoughtfully consider the knowledge you gain when caring for patients. Being open-minded, inquisitive, and systematic in thinking about practice situations will also help you incorporate research findings in your clinical decision making (Profetto-McGrath et al., 2003).

Nurses who apply critical thinking in their work consider all aspects of a situation and make well-reasoned judgements about a variety of possible alternative actions rather than hastily and carelessly implementing solutions (Kataoka-Yahiro & Saylor, 1994). For example, nurses who work in crisis situations such as child abuse and suicide prevention programs act quickly when patient problems develop. These nurses must, however, exercise discipline in decision making to avoid premature and inappropriate decisions. Learning to think critically helps you to care for patients as their advocate and to make better informed choices about their care. Critical thinking is more than just problem solving; it is an attempt to continually improve how you apply knowledge when faced with problems in patient care.

A Critical Thinking Model for Clinical Decision Making

Thinking critically is becoming the benchmark or standard for professional nursing competence. To help you in the development of critical thinking, this text offers a model for critical thinking. Because critical thinking in nursing is complex, a model helps explain what is involved as you make clinical decisions and judgements about your patients. Kataoka-Yahiro and Saylor (1994) developed a model of critical thinking for nursing judgement based in part on previous work by Paul (1993), Glaser (1941), Perry (1979), and Miller and Malcolm

► **TABLE 11-1** Critical Thinking Skills and Dispositions

Elements of Decision-Making Process

Skill

Interpretation

Be orderly in data collection. Look for patterns to categorize data (e.g., formulate nursing diagnoses [see Chapter 12]). Clarify any data about which you are uncertain.

Analysis

Be open-minded as you look at information about a patient. Do not make careless assumptions. Ask whether the data reveal what you believe is true or whether other scenarios are possible.

Inference

Examine meanings and relationships in the data. Form reasonable hypotheses and conclusions, on the basis of the patterns observed.

Explanation

Assess all situations objectively. Use criteria (e.g., expected outcomes) to determine the effectiveness of nursing actions. Identify required changes. Reflect on your own behaviour.

Explanation

Support your findings and conclusions. Use knowledge and experience to select the strategies you use in the care of patients.

Self-regulation

Reflect on your experiences. Adhere to standards of practice. Apply ethical principles in your nursing practice. Identify in what way you can improve your own performance.

Dispositions or Habits

Truth seeking

Learn what is actually happening in a situation. Consider scientific principles and evidence, even if they do not support your preconceptions or personal beliefs.

Open-mindedness

Be receptive to new ideas and tolerant of other points of view. Respect the right of other people to hold different opinions. Be aware of your own prejudices.

Analyticity

Determine the significance of a situation. Interpret meaning. Anticipate possible results or consequences. Use evidence-informed knowledge in your nursing practice.

Systematicity

Be organized and focused in data collection. Use an organized approach to problem solving and decision making.

Self-confidence

Trust your own reasoning processes. Seek confirmation from experts when uncertain.

Inquisitiveness

Actively seek new knowledge.

Maturity

Accept that multiple solutions are possible. Reflect on your own judgements; be willing to consider other explanations. Use prudence in making, suspending, or revising judgements.

Adapted from Facione, P. (1990). *Critical thinking: A statement of expert consensus for purposes of educational assessment and instruction. The Delphi report: Research findings and recommendations prepared for the American Philosophical Association* (ERIC Doc No. ED 315-423). Washington, DC: Educational Resources Information Center (ERIC).

(1990) (Figure 11-1). The model defines the outcome of critical thinking: nursing judgement that is relevant to nursing problems in a variety of settings.

Throughout this text, this model is used for applying critical thinking during the **nursing process** (see Chapter 5). Each clinical chapter of the text (Chapters 31 to 48) is organized by the steps of the nursing process and includes both scientific and nursing knowledge. It is your knowledge base (the first critical thinking component) that prepares you to make clinical judgements as a nurse. Figure 11-1 demonstrates how to apply elements of critical thinking in assessing patients, in planning the interventions you provide, and in evaluating your results. Applying each element of this model in the way you think about patients will help you become a confident and effective professional.

Levels of Critical Thinking in Nursing

Your ability to think critically grows as you gain new knowledge and experience in nursing practice. Kataoka-Yahiro and Saylor (1994) developed a critical thinking model that incorporates three levels of critical thinking in nursing: basic, complex, and commitment. As a beginning nursing student, you apply the critical thinking model at the basic level. As you advance in practice, you adopt complex critical thinking and commitment.

Basic Critical Thinking

At the basic level of critical thinking, a learner trusts that experts have the right answers for every problem. Thinking is concrete and based on a set of rules or principles. For example, as a student nurse, you use a hospital's procedure manual to confirm how to insert a Foley catheter. In completing this procedure for the first time, you will probably follow the procedure step by step without adjusting the procedure to meet a patient's unique needs (e.g., positioning to minimize the patient's pain or mobility restrictions) because you do not have enough experience to know how to individualize the procedure. At this level, answers to complex problems are seen to be either right or wrong (e.g., the Foley catheter balloon contains too much or not enough sterile water), and you may believe that one right answer exists for each problem. As you gain more experience in nursing, you will begin to explore the diverse opinions and values of experts (e.g., instructors and staff nurse role models) and engage in more complex critical thinking.

Complex Critical Thinking

When you engage in complex critical thinking, you begin to separate your thinking processes from those of authorities and to analyze and examine choices more independently. Your thinking abilities and initiative to look beyond expert opinion begin to change, as you realize that alternative, and perhaps conflicting, solutions to a problem or issue exist.

Consider the following case study:

Mr. Rosen is a 36-year-old man who injured his back in a skiing accident. He suffers from chronic pain but is refusing to take a prescribed analgesic. While discussing the importance of rehabilitation with Mr. Rosen, the nurse, Edwina, learns that Mr. Rosen practises meditation at home. In complex critical thinking, Edwina recognizes that for pain relief, the patient has options other than accepting analgesics. Edwina decides to also discuss other nonpharmacological interventions with Mr. Rosen and his other health care providers even though not all may agree about their potential efficacy in controlling his pain.

In complex critical thinking, you are willing to consider other options in addition to routine procedures when complex situations develop. As a nurse, you learn to weigh the benefits and risks of each potential solution before making a final decision. Thinking becomes more creative and innovative as you explore a broad range of perspectives and alternative solutions.

Commitment

The third level of critical thinking is commitment. You anticipate the need to make choices without assistance from

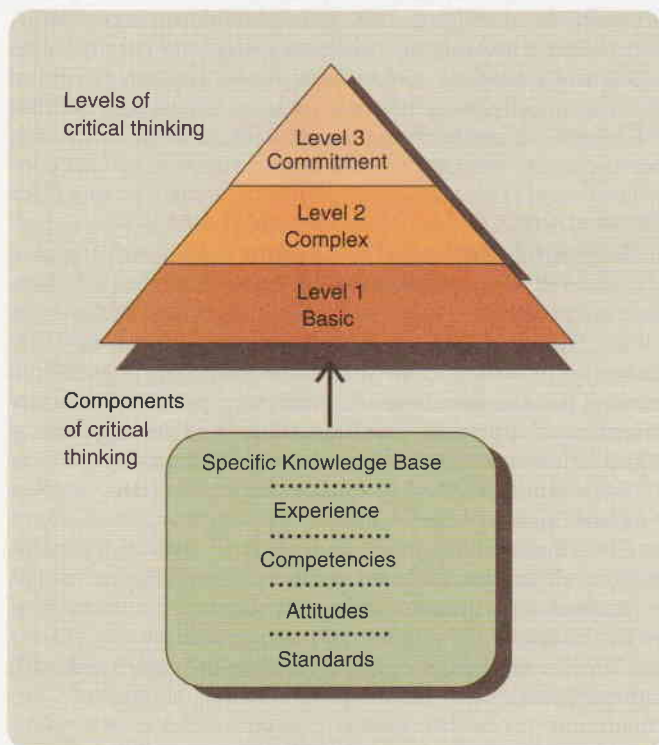


Figure 11-1 Critical thinking model for nursing judgement. **Source:** Redrawn from Kataoka-Yahiro, M., & Saylor, C. (1994). A critical thinking model for nursing judgment. *Journal of Nursing Education*, 33(8), 351. Adapted from Glaser, E. (1941). *An experiment in the development of critical thinking*. New York: Bureau of Publications, Teachers College, Columbia University; Miller, M., & Malcolm, N. (1990). Critical thinking in the nursing curriculum. *Nursing & Health Care*, 11, 67; Paul, R. W. (1993). The art of redesigning instruction. In Willsen, J., & Blinker, A. J. A. (Eds.). *Critical thinking: How to prepare students for a rapidly changing world*. Santa Rosa, CA: Foundation for Critical Thinking; and Perry, W. (1979). *Forms of intellectual and ethical development in the college years: A scheme*. New York: Holt, Rinehart, & Winston.

other professionals, and then you assume responsibility and accountability for those choices. As a nurse, you do more than just consider the complex alternative solutions that a problem poses. At the commitment level, you choose an action or belief on the basis of the alternative solutions available, and you stand by your choice. Sometimes an action is to not take action, or you may choose to delay an action until a later time as a result of your experience and knowledge. Because you take accountability for the decision, you give attention to the results of the decision and determine whether it was appropriate.

Components of Critical Thinking in Nursing

Critical thinking consists of five components: knowledge base, experience, competencies, qualities, and standards. These elements explain how nurses make clinical judgements that are necessary for safe, effective nursing care (Box 11-1).

Specific Knowledge Base

To think critically, establish accurate clinical judgements and decisions, and improve clinical practice (Di Vito-Thomas, 2005), nurses must possess a sound knowledge base. Your knowledge base includes information and theory from the basic sciences, humanities, behavioural sciences, and nursing. Nurses use their knowledge base in a different way than other health care providers because they think holistically about patient problems and health-related matters. For example, a nurse's broad knowledge base offers a physical, psychological, social, moral, ethical, and cultural view of patients and their health concerns. The breadth and depth of your knowledge influences your ability to think critically about nursing problems. Consider the scenario on the following page:

► BOX 11-1

Components of Critical Thinking in Nursing

- I. Specific knowledge base
- II. Experience in nursing
- III. Critical thinking competencies
 - A. General critical thinking competencies (scientific method, problem solving, and decision making)
 - B. Specific critical thinking competencies in clinical situations (diagnostic reasoning, clinical inference, and clinical decision making)
 - C. Specific critical thinking competency in nursing (use of nursing process)
- IV. Attitudes for critical thinking
- V. Standards for critical thinking
 - A. Intellectual standards
 - B. Professional standards
 1. Ethical criteria for nursing judgement
 2. Criteria for evaluation
 3. Professional responsibility

Adapted from Kataoka-Yahiro, M., & Saylor, C. (1994). A critical thinking model for nursing judgment. *Journal of Nursing Education*, 33(8), 351. Data from Paul, R. W. (1993). The art of redesigning instruction. In Willsen, J., & Blinker, A. J. A. (Eds.). *Critical thinking: How to prepare students for a rapidly changing world*. Santa Rosa, CA: Foundation for Critical Thinking.

Robert Perez previously earned a bachelor's degree in education and taught high school for one year. He has successfully completed the required human and biological science courses in his nursing program as well as those related to health ethics, fundamental nursing concepts, and communication principles. His first clinical course focuses on health promotion, with a clinical assignment in an outpatient primary care clinic. Although he is still new to nursing, his experience as a teacher and his preparation and knowledge base in nursing will help him know how to begin to make clinical decisions about patients' self-care and health promotion practices.

Experience

Nursing is a practice discipline. Clinical nursing experiences are necessary for you to acquire clinical decision-making skills (Roche, 2002). In clinical situations, you learn from observing, sensing, talking with patients and families, and then reflecting actively on your experiences. Clinical experience is the laboratory for evaluating nursing knowledge. You learn that "text-book" approaches form the basis for nursing practice, but you make safe adaptations or revisions in approaches to accommodate the setting, the unique qualities of the patient, and the experience you gained from caring for previous patients. With experience, you begin to understand clinical situations, recognize cues of patients' health patterns, and interpret cues as relevant or irrelevant (Tanner, 2006), and your critical thinking skills advance beyond the basic level. You also learn to seek new knowledge as needed, act quickly when events change, and make quality decisions that promote the patient's well-being. It is important for you to admit to any limitations in your knowledge and skills. Critical thinkers admit what they do not know and try to acquire the knowledge needed to make correct decisions. A patient's safety and welfare are at risk if you do not admit your inability to deal with a practice problem. You must rethink the situation, acquire additional knowledge, and then use new information to form opinions, draw conclusions, and take appropriate action. Perhaps the best lesson to be learned by a new nursing student is to value all patient experiences, which enable you to build new knowledge and inspire innovative thinking.

During the previous summer, Robert worked as a nurse assistant in a long-term care facility. This experience provided him with valuable experience in interacting with older adults and in giving basic nursing care. Specifically, he has been able to develop good interviewing skills and understand the importance of the family in an individual's health. He has also learned that older adults require more time to perform activities such as eating, bathing, and grooming, and so he has adapted skill techniques for dealing with this requirement. His time in the physical assessment laboratory and the time he worked in the nursing home helped him begin to be a careful observer. As he reflects on his experiences, Robert also knows that much of what he learned can be applied in promoting health, wellness, and independence among the older patients who attend the outpatient primary care clinic for routine follow-up visits.

Becoming familiar with practice standards developed by clinical experts assists you in enhancing your knowledge base. For example, the Best Practice Guidelines developed by the Registered Nurses' Association of Ontario (RNAO) include standards for patient-centred nursing care and for a number of clinical conditions, such as asthma, chronic obstructive pulmonary disease, diabetes, and depression. Other standards focus on nursing practice issues such as embracing cultural diversity and fostering collaborative practice. Visit the RNAO's

Web site (<http://www.rnao.org/bestpractices/>), as well as the Web site of the professional nursing association in the province or territory in which you reside, to learn more about the wide range of practice guidelines and to develop a sound knowledge base for your nursing practice. Including a focus on wellness in the care you provide means you also need to think about how the social determinants of health (see Chapter 1) influence patient access to the resources they need in the community to deal with chronic disease, prevent illness and injury, and increase their health and well-being (Canadian Nurses Association, 2009). Incorporating interprofessional collaboration, including shared decision making and working in partnership with other health providers, in your practice as a nurse enhances health outcomes for the individuals, families, and communities you encounter (Canadian Interprofessional Health Collaborative, 2010).

Critical Thinking Competencies

Kataoka-Yahiro and Saylor (1994) described critical thinking competencies as the cognitive processes that a nurse uses to make judgements about the clinical care of patients. They include general critical thinking, specific critical thinking in clinical situations, and specific critical thinking in nursing. General critical thinking competencies are not unique to nursing. They include the scientific method, problem solving, and decision making. Specific critical thinking competencies in clinical situations include diagnostic reasoning, clinical inference, and clinical decision making. The specific critical thinking competency in nursing involves use of the nursing process.

General Critical Thinking Competencies

Scientific Method. The scientific method is a systematic, ordered approach to gathering data and solving problems that is used in nursing, medicine, and various other disciplines. Nurse researchers use the scientific method to verify that a set of facts is true when testing research questions in nursing practice situations. Research incorporating the scientific method contributes to evidence-informed nursing practice and the development of best practice guidelines.

The scientific method has five steps:

- Identification of the problem
- Collection of data
- Formulation of a research question or hypothesis
- Testing of the question or hypothesis
- Evaluation of the results of the test or study

Consider the following example of the scientific method in nursing practice:

A nurse caring for patients who receive large doses of chemotherapy for ovarian cancer detects a pattern whereby these patients develop severe inflammation of the mouth (mucositis) (identifies the problem). The nurse reads research articles (collects data) about mucositis and learns about evidence that cryotherapy, in which patients keep ice in their mouths during the chemotherapy infusion, reduces the severity of the mucositis after treatment. The nurse asks (forms research question), "Can ovarian cancer patients who receive chemotherapy have less severe mucositis when given cryotherapy instead of standard mouth rinse in the oral cavity?" The nurse then designs a study that compares the incidence and severity of mucositis in a group of patients who use cryotherapy with those in patients who use traditional mouth rinse (tests the question). The nurse hopes that the results from the study will give oncology nurses a better approach for reducing the

frequency and severity of mucositis in cancer patients. A nurse in another oncology setting critically analyzes the study before implementing its recommendations for patient care (evaluates the results of the study).

Problem Solving. Everyone faces problems every day. When a problem arises, people obtain information and then use the information, in addition to what they already know, to find a solution. Patients routinely present problems in nursing practice. For example, a home care nurse visits a patient and learns that the patient cannot describe what medications she has taken for the past three days. The nurse must solve the problem of why the patient is not adhering to her medication schedule. The nurse knows the patient was recently discharged from the hospital and five medications were prescribed. When the nurse asks the patient to show the medications that she takes in the morning, the nurse notices that the patient has difficulty reading the medication labels. The patient is able to tell the nurse the names of the medications she is to take but is uncertain about the times of administration. The nurse recommends having the patient's pharmacy relabel the medications in larger lettering. In addition, the nurse shows the patient examples of pill organizers that will help her sort her medications by time of day for a period of seven days.

Effective **problem solving** also involves evaluating the solution over time to be sure that it is still effective. It becomes necessary to try different options if a problem recurs. As a continuation of the example just described, the nurse finds during a follow-up visit that the patient has organized her medications correctly and is able to read the labels without difficulty. The nurse obtained information that correctly clarified the cause of the patient's problem, and the nurse tested a solution that proved successful. Having solved a problem in one situation adds to the nurse's experience in practice and allows the nurse to apply that knowledge in future situations with patients.

Decision Making. When you face a problem or situation and need to choose a course of action from several options, you are making a decision. **Decision making** is a product of critical thinking that focuses on problem resolution. Following a set of criteria helps you make a well-reasoned decision. For example, decision making occurs when a person chooses a fitness consultant. To make a decision, the person has to recognize and define the problem (need for a physical activity) and assess all options (consider recommended trainers or choose one on the basis of proximity to the person's home). The person has to weigh each option against a set of criteria (e.g., credentials, reputation, experience), test possible options (interview potential trainers, assess safety of equipment), consider the consequences of the decision (increased fitness, risk of injury), and then make a final decision. Although the criteria follow a sequence of steps, decision making involves moving back and forth between steps when all criteria are considered. Decision making leads to informed conclusions that are supported by evidence and reason. Examples of decision making include deciding on a choice of dressings for a patient with a surgical wound or selecting the best approach for teaching a family how to assist a patient who is returning home after a stroke. You learn to make sound decisions by approaching each clinical situation thoughtfully and by applying each component of the decision-making process described previously.

Specific Critical Thinking Competencies in Clinical Situations

Diagnostic Reasoning and Inference. As soon as you receive information about a patient in a clinical situation, you begin **diagnostic reasoning**, a process of determining a patient's health status after you make physical and behavioural observations and after you assign meaning to the behaviours, physical signs, and symptoms exhibited by the patient. The information that you collect and analyze leads to a diagnosis of the patient's condition. An expert nurse sees the context of a patient situation (e.g., recognizes that a patient who is feeling lightheaded, has blurred vision, and has a history of diabetes is experiencing a problem with blood glucose levels), observes patterns and themes (e.g., symptoms including weakness, headache, hunger, and visual disturbances that suggest hypoglycemia), and chooses an appropriate intervention quickly (e.g., offers a food source containing glucose) (Ferrario, 2004). Considering the context of the situation enhances the nurse's analytic skills (Ironside, 2005) and results in a more accurate diagnosis.

Part of diagnostic reasoning is **clinical inference**: the process of drawing conclusions from related pieces of evidence (Smith Higuchi & Donald, 2002). An inference involves forming patterns of information from data before making a diagnosis. Seeing that a patient has lost his appetite and experienced a loss of weight over the past month, the nurse infers that the patient has a nutritional problem. An example of diagnostic reasoning is forming a nursing diagnosis such as imbalanced nutrition, less than body requirements (see Chapter 42).

Often you cannot make a precise nursing diagnosis during your first meeting with a patient. You will sometimes sense that a problem or health concern exists, but you do not have sufficient data to make a specific diagnosis. Some patients' physical conditions limit their ability to tell you about symptoms. Other patients may choose not to share sensitive and important information during your initial assessment. Patients' behaviours and physical responses may become observable only under certain conditions not present during your initial assessment. When you are uncertain of a diagnosis, continue data collection, which may include consulting with expert nurses or other health care providers. As a nurse, you must critically analyze changing clinical situations until you are able to determine the patient's unique situation. Diagnostic reasoning is a continuous behaviour in nursing practice.

In diagnostic reasoning, use patient data that you gather to logically explain a clinical judgement. For example, after turning a patient over in bed, you see an area of redness and a small blister on his right hip. You palpate the area and note that it is warm to the touch, and the patient complains of tenderness there. You push on the area with your finger, and, after you release pressure, the area does not blanch or turn white. You think about what you know about normal skin integrity and the effects of pressure. You form the conclusion the patient has a Stage I pressure ulcer. As a new student, confirm your judgement with experienced nurses. At times, your clinical judgement may be incorrect (e.g., a blistered area is indicative of a Stage II pressure ulcer; <http://mao.ca/bpg/fact-sheets/taking-pressure-preventing-pressure-ulcers>); however, nurse experts will give you feedback to build on in future clinical situations.

Nurses do not make medical diagnoses, but they do assess and monitor patients closely and compare the patient's signs and symptoms with those that are common to a medical

diagnosis. This type of diagnostic reasoning helps nurses and other health care providers pinpoint the nature of a problem more quickly and select proper interventions. Similarities and differences between medical and nursing diagnoses are described in more detail in Chapter 12.

Clinical Decision Making. Clinical decision making is a problem-solving activity that focuses on defining patient problems and selecting appropriate treatments (Smith Higuchi & Donald, 2002). Nurses are responsible for making accurate and appropriate clinical decisions. Clinical decision making distinguishes professional nurses from technical personnel. It is the professional nurse, for example, who takes immediate action when a patient's clinical condition deteriorates, decides whether a patient is experiencing complications that call for notification of a physician, or decides whether a teaching plan for a patient is ineffective and necessitates revision. Benner (1984) described clinical decision making as judgement that includes critical and reflective thinking and action and the application of scientific and practical knowledge.

Clinical judgement requires that you recognize the salient aspects of a clinical situation, interpret their meanings, and respond appropriately. It includes four components: noticing or grasping the situation; interpreting or developing a sufficient understanding of the situation to respond; responding or deciding on a course of action; and reflecting on or reviewing the actions taken and their outcomes. In making a clinical judgement, you consider the context of the situation and rely on analytic processes, intuition, and narrative thinking (i.e., thinking that occurs as a result of telling and interpreting stories). As you reflect on actions taken, you acquire clinical learning, which contributes to future clinical judgements (Tanner, 2006).

Nurses regularly encounter practice situations in which little is straightforward (Hartrick Doane & Brown, 2011). Each patient's problems are unique and products of many factors, including the patient's physical health, lifestyle, culture, relationship with family and friends, living environment, and experiences. As a nurse, you do not always have a clear picture of the patient's needs and the appropriate actions to take when you first meet a patient. Instead, you must learn to question and explore different perspectives and interpretations in order to find a solution that benefits the patient (Box 11-2).

When you approach a clinical problem, such as a patient who is experiencing difficulty walking, you make a decision that identifies the problem (e.g., right-sided weakness) and choose nursing interventions (e.g., teaching the use of appropriate assistive devices) for that patient. Nurses constantly make clinical decisions to improve a patient's health or maintain wellness. Clinical decision making requires careful reasoning so that you choose the options for the best patient outcomes on the basis of the patient's condition and the priority of the problem or health concern.

You improve your clinical decision making by knowing your patients. Nurse researchers found that expert nurses develop a level of knowing that leads to pattern recognition of patient's symptoms and responses (White, 2003). For example, an expert nurse who has worked on a general surgery unit for many years is more likely to detect signs of internal hemorrhage (e.g., fall in blood pressure, rapid pulse, change in consciousness) than is a new nurse. Over time, a combination of knowledge, experience, time spent in a specific clinical area, and the quality of relationships formed with patients allow expert nurses to know clinical situations and quickly anticipate

* BOX 11-2 RESEARCH HIGHLIGHT

Working Relationships of Public Health Nurses and High-Priority Families

Focus

In this study, the nature of working relationships of public health nurses and high-risk (i.e., high-priority) families in northern communities in Canada was examined with the intent of informing nursing practice, education, and policy.

Abstract

The researchers conducted interviews with 32 families, 25 public health nurses, and 3 lay visitors. An interpretive hermeneutic approach was used to examine the practices and problems nurses and families encountered as care was being provided to a vulnerable, isolated, and often marginalized population, while navigating the complexity and unpredictability of working and living in the same small community. The working relationships of public health nurses and high-risk families were found to be multifaceted and to involve processes related to engaging and entering into relationships, maintaining relationships, and negotiating roles and boundaries.

Evidence-Informed Practice

The relationships of public health nurses and high-risk families extend beyond the home, clinic, or office and intersect with other facets of everyday life within the community. This means that public health nurses must be attuned to having and using power, maintaining privacy and confidentiality, and setting and crossing boundaries in their work with high-risk families. Working with high-risk families also means that public health nurses must engage them in a manner that opens possibilities for understanding, encourages reflection, builds on the strengths of the families, and invites healing.

Reference: Moules, N. J., MacLeod, M. L. P., Thirsk, L. M., & Hanlon, N. (2010). "And then you'll see her in the grocery store": The working relationships of public health nurses and high-priority families in northern Canadian communities. *Journal of Pediatric Nursing*, 25, 327–334.



and select the right course of action (Tanner et al., 1993). Spending more time during initial patient assessments to both observe patient behaviour and measure physical findings is a way to improve knowing your patients. Also, consistently monitoring patients as problems occur helps you see how clinical changes develop over time. The selection of nursing actions is built on both clinical knowledge and patient data, including the following:

- The identified status and situation of the patient
- Knowledge about the clinical variables (e.g., patient's age, seriousness of the problem, pathological process of the problem, patient's pre-existing disease conditions) involved in the situation and how the variables are linked together
- Knowledge about the usual patterns of any diagnosed problem or prognosis and a judgement about the likely course of events and outcomes of the diagnosed problem, in view of any co-existing health risks the patient also possesses
- Any additional relevant information about the patient's daily living situation, functional capacity, and social resources
- Knowledge about the nursing interventions available and the way in which specific actions will predictably affect the patient's situation

After determining a patient's nursing care priorities, you select actions most likely to relieve each problem or to promote health, wellness, and quality of life. A wide range of choices is often available, from nurse-administered to patient self-care strategies. You collaborate with the patient and then select, test, and evaluate the chosen approaches. Making an accurate clinical decision allows you to set priorities for nursing action. Because each situation involves different patients and different variables, a certain activity is sometimes more of a priority in one situation and less of a priority in another. For example, if a home care patient is physically dependent, unable to eat, and incontinent of urine, skin integrity is of higher priority than if the patient were immobile but continent of urine and able to eat a normal diet. Do not assume that certain health situations produce automatic priorities. For example, an adolescent who has embarked on a smoking cessation program is expected to experience some withdrawal symptoms, which often become a priority of care. However, if the patient is experiencing anxiety about potential weight gain that decreases her ability to participate fully in the program, it becomes necessary for you to focus on ways to relieve the anxiety before the smoking cessation measures will be effective.

Nurses make decisions about individual patients and about groups of patients. You use criteria such as the clinical condition of the patients, Maslow's hierarchy of needs, risks involved in treatment delays, and patients' expectations of care to determine which patients have the most urgent priorities for care. For example, a patient in a community care centre who is experiencing a sudden drop in blood pressure along with a change in consciousness requires your attention immediately, as opposed to a small child who requires a routine immunization or a group of expectant parents attending a prenatal class. In order for you to manage the wide variety of problems associated with groups of patients, skillful, prioritized decision making is crucial (Box 11-3).

Nursing Process as a Critical Thinking Competency

Nurses apply the nursing process as a critical thinking competency when delivering patient care. The nursing process is a five-step clinical decision-making approach that consists of assessment, diagnosis, planning, implementation, and evaluation (see Chapters 12 to 14). The purpose of the nursing process

is to assist nurses in identifying and treating patients' health-related concerns and to help patients meet agreed-upon outcomes for better health (Figure 11-2). The nursing process incorporates general (e.g., scientific method, problem solving, and decision making) and specific critical thinking competencies (e.g., diagnostic reasoning, inference, and clinical decision making), described earlier in this chapter, in a manner that focuses on a particular patient's unique needs. The format of the nursing process is unique to the discipline of nursing and provides a common language and process for nurses to "think through" patients' clinical problems (Kataoka-Yahiro & Saylor, 1994). Chapter 12 describes the nursing process in more detail.

The nursing process is often called a blueprint or plan for care. It allows flexibility for use in all clinical settings. When you use the nursing process, you identify a patient's health-related concerns, clearly define a nursing diagnosis or collaborative problem, determine priorities of care, and set goals and expected outcomes of care. Then you develop and communicate a plan of care, perform nursing interventions, and evaluate the effects of your care. Involving your patient in each step of the nursing process helps ensure that care is patient centred. When you become more competent in using the nursing process, you are able to focus on multiple problems or diagnoses and to move back and forth between steps when considering all the information available to you about a patient's concerns.

Attitudes for Critical Thinking

The fourth component of the critical thinking model incorporates the attitudes needed to think critically. An important part of critical thinking is interpreting, evaluating, and making judgements about the adequacy of various arguments and available data. Attitudes determine how a successful critical thinker approaches a problem or a situation that necessitates decision making. For example, when a patient complains of anxiety before undergoing a diagnostic procedure, the curious nurse explores possible reasons for the patient's concerns. The nurse also exhibits discipline and perseverance in taking responsibility to complete a thorough assessment to find the sources of the patient's anxiety. Engaging in inquiry involves an ability to recognize that problems exist and that you need evidence in support of what you suppose to be true (Watson

► BOX 11-3

Clinical Decision Making for Groups of Patients

- Identify the nursing diagnosis and collaborative problems of each patient.
- Analyze patients' diagnoses or problems and decide which are most urgent in light of the patient's basic needs, changing or unstable status, and problem complexity.
- Consider the resources available for managing each problem, including unregulated care providers assigned to work with you and the patients' family members.
- Consider how to involve the patients as decision makers and participants in care.
- Decide how to combine activities to resolve more than one patient problem at a time.
- Decide what, if any, nursing care procedures to delegate to unregulated care providers so that you are able to spend your time on activities requiring professional nursing knowledge.

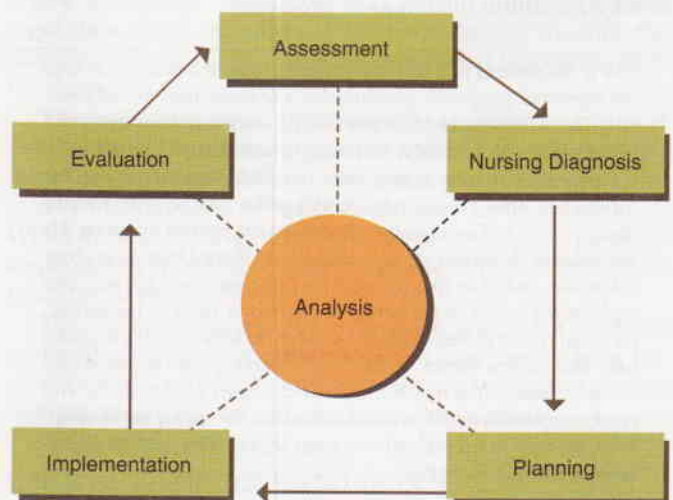


Figure 11-2 Five-step nursing process model.

& Glaser, 1980). Knowing when you need more information, knowing when information is misleading, and recognizing your own knowledge limits and personal biases are examples of how critical thinking attitudes play a key role in decision making.

Standards for Critical Thinking

The fifth component of the critical thinking model includes intellectual and professional standards (Kataoka-Yahiro & Saylor, 1994).

Intellectual Standards. An intellectual standard is a guideline or principle for rational thought. You apply such standards when you conduct the nursing process. When you consider a patient problem, apply intellectual standards such as thoroughness, precision, accuracy and consistency to make sure that all clinical decisions are sound. Efficacious use of the intellectual standards in clinical practice ensures that you do not perform critical thinking haphazardly.

Professional Standards. Professional standards for critical thinking refer to ethical criteria for nursing judgements, evidence-informed criteria for evaluation, and criteria for professional responsibility. Professional standards promote the highest level of quality nursing care for individuals and groups in institutional and community-based settings.

Ethical Criteria for Nursing Judgement. Patient care requires more than just the memorization and application of scientific knowledge (Ironside, 2005). Effective nursing practice reflects sound ethical principles. Being able to focus on a patient's values and beliefs helps you make clinical decisions that are just, faithful to the patient's choices, and beneficial to the patient's health and well-being. *The Code of Ethics for Registered Nurses* (Canadian Nurses Association, 2008) is based on core values that serve as a guide to ethical decision making in nursing practice. Among these values and ethical responsibilities are providing safe, compassionate, competent, and ethical care; promoting health and well-being; promoting and respecting informed decision making; preserving dignity; maintaining privacy and confidentiality; promoting justice; and being accountable. Critical thinkers maintain a sense of self-awareness through conscious awareness of their own values, beliefs, and feelings and of the multiple perspectives of patients, family members, staff, and peers in clinical situations. Chapter 7 summarizes ethical standards to use when you are faced with ethical dilemmas or problems.

One of the patients in a community health clinic is a young man who has signs and symptoms of chlamydia, a sexually transmitted infection. The patient has had the symptoms for more than three weeks and voices concern about what it will mean to have the infection. Richard, a nurse, examines the young man and finds that the patient has redness and itching on his penis, with a yellowish discharge. Richard checks further and asks whether the patient has pain on urination. He also assesses the patient for fever. Richard has limited knowledge about chlamydia, and so he consults with the clinic nurse practitioner, who explains the nature of the infection, the risks it poses to the patient, the usual course of treatment, and some of the legal and ethical guidelines that govern nurses' actions when working with patients with sexually transmitted infections. Richard returns to the patient and speaks confidently with him about chlamydia, the reason for his symptoms, the need to tell sex partners about the infection, and the importance of wearing a condom.

Criteria for Evaluation. Nurses routinely use evidence-informed criteria to assess patients' conditions and to

determine the efficacy of nursing interventions. For example, accurate assessment of symptoms such as pain or shortness of breath requires use of assessment criteria such as the duration, severity, location, aggravating or relieving factors, and effects on daily lifestyle (see Chapter 41). In this case, assessment criteria allow you to accurately determine the nature of a patient's symptoms, select appropriate interventions, and later evaluate whether the interventions are effective. Another example is the determination of the stage of a pressure ulcer on the basis of scientific criteria, including temperature, tissue consistency, and depth of the wound (see Chapter 46). The criteria allow you to identify the stage of a pressure ulcer and to track how quickly it heals.

Professional Responsibility. The standards of professional responsibility that a nurse strives to achieve are the standards cited in institutional practice guidelines, professional organizations' standards of practice, and legislation governing nursing practice. To view the nursing practice standards that govern nurses' actions in your jurisdiction, visit the Web site of the professional nursing association in the province or territory in which you reside. These standards outline the responsibilities and accountabilities that a nurse assumes in guaranteeing high-quality health care to the public.

Developing Critical Thinking Skills

To develop critical thinking skills, it is important to learn how to connect knowledge and theory in practice (Box 11-4). Making sense of what you learn in the classroom, from reading, or from dialogue with other students, and then applying it during patient care is always challenging. Learning approaches such as reflective journal writing and concept mapping will assist you in developing and improving your critical thinking skills.

Reflective Journal Writing

How often do you think back on a situation to consider why it occurred? How did you act? What could you have done differently? What knowledge could you have used? **Reflection** is the process of purposefully thinking back or recalling a situation to discover its purpose or meaning. Reflection is necessary for self-evaluation and improvement of nursing practice.

Reflective journal writing is a tool for developing critical thought and reflection through clarifying concepts (Bilinski, 2002). Reflective writing gives you the opportunity to define and express a clinical experience in your own words (Di Vito-Thomas, 2005) and improves your observation and descriptive skills. By keeping a reflective journal of each of your clinical experiences, you are able to explore your perceptions and understanding of the experience and develop the ability to apply theory in practice. Reflective writing invites you to consider questions such as "What have I learned from this experience?" "How will I use what I have learned if I encounter a similar situation in the future?"

Keeping a journal of your patient care experiences will help you become aware of how you use clinical decision-making skills (Kessler & Lund, 2004). Begin by recording notes after a clinical experience. Telling a story and drawing a picture are two additional ways to identify the experience you wish to reflect on. Describe in detail what you felt, thought, and did. Analyze your experience by considering thoughts, feelings, and possible meanings for you and the patient. Challenge any preconceived ideas you have when you look at actual clinical situations. Describe the significance of the experience. Refer to

* BOX 11-4 RESEARCH HIGHLIGHT

Decision Making by Baccalaureate Nursing Students

Focus

Researchers agree that decision making is a skill that needs to be taught in nursing education programs but few have examined the kinds of decisions students make in clinical settings and the factors that influence their decision making.



Abstract

In this study, nurse decision making was defined as “a cognitive process requiring patient assessment and problem identification, the identification and consideration of alternatives, the consideration of preferences and values (of all parties involved), the selection of interventions, and the determination of how best to achieve those interventions” (p. 346). Nineteen full-time students in all four levels of a nursing program at a Canadian university completed two reflective journal entries about their decision making in a recent clinical encounter, prior to engaging in a related interview. Key curriculum documents, including program and level goals, and course objectives for the clinical courses in all four levels of the program, were also examined to provide context and help explain student decision making. The study revealed that students made decisions related to encounters with patients, nursing staff, and clinical instructors.

Evidence-Informed Practice

Students at all levels of the program described five key kinds of decisions:

- **Assessment**, including deciding what patient data to gather and how to gather it
- **Intervention**, including deciding what needs to be done to maintain or improve a patient's health
- **Resource**, including deciding who or what the student needs to support them in the decision-making process and how to effectively use the resource
- **Communication**, including deciding who to approach, what communication strategies to use with the patient, nursing staff, or preceptor, and how to communicate with others to engage them in the decision-making process
- **Action**, including deciding whether to proceed with the decision-making process, whether an intervention will be implemented, and whether information will be communicated to another health care provider.

Understanding the kinds of decisions students make is important in developing curricula to enhance students' cognitive abilities and to prepare them to make sound, autonomous decisions when they enter the workplace as graduate nurses.

Reference: Baxter, P. E., & Boblin, S. (2008). Decision making by baccalaureate nursing students in the clinical setting. *Journal of Nursing Education*, 47, 345–350.

your journal often when you care for patients in similar circumstances. Reflecting on your experiences is an important component of monitoring your competence in nursing practice. It also promotes knowledge transfer by enabling you to identify how previously acquired knowledge can be applied in a current or future situation (Nielsen et al., 2007).

Reflective journal writing can also help you learn to “see the other” when working with patients and families, even though you may not have had similar experiences. Instead becoming

a source of fear, diversity and difference can become an opportunity for you to engage in dialogue and come to understand their experience. Reflection allows you to examine your assumptions about what it means to be of a different age, race, or sexual orientation or to suffer from a mental illness. As you enter into the world of the other and begin to appreciate their experience, the degree of difference and potential for alienation are decreased (Binding et al., 2010). “Seeing the other” helps you determine the kinds of interventions that will be most effective in addressing the patient's desired health outcomes.

Concept Mapping

As a nurse, you care for patients who have multiple nursing diagnoses or collaborative problems. A **concept map** is a visual representation of patient problems and interventions that depicts their relationships to one another (Schuster, 2003). The primary purpose of concept mapping is to synthesize relevant data about a patient, including assessment data, nursing diagnoses, health needs, nursing interventions, and evaluation measures (Hill, 2006). Through drawing a concept map, you learn to move beyond memorizing and recalling facts to organizing or linking information in a unique way so that the diverse information you have about a patient begins to connect to form meaningful patterns and concepts. When you see the relationship between the various patient diagnoses and the data that support them, you gain a holistic understanding of a patient's clinical situation. Over time, your concept maps will become more detailed, integrated, and comprehensive as you learn more about the care of a patient and as you care for similar patients (Ferrario, 2004). You will see similarities and differences between patients, which helps you hone your decision-making skills.

Concept maps take many visual forms. Several examples of concept maps are included in other chapters of this textbook. Additional resources are also found in the Web site list at the end of this chapter. Most students follow a model that makes the concept map a working document. As a student, you develop the map during your care for the patient. You begin by obtaining patient data from a variety of sources (e.g., the medical record, pertinent nursing literature, the patient's history and physical examination, and other health care providers). The patient's major medical diagnosis and any comorbid conditions (unrelated medical conditions) usually form the centre of the map. From there, you group patterns of assessment data along the edges of the map. As you identify the different nursing diagnoses, you draw dotted lines to connect the diagnoses that are related.

The links must be accurate in order to show true clinical relationships. On the map, you also list the nursing interventions chosen for the patient. Once again, you see how any one intervention applies to more than one nursing diagnosis. While caring for a patient, you write down the patient's responses to your interventions and any clinical impressions you may have.

The final map gives you a broader and more complex understanding of your patient's health care needs. Save the concept maps you create and use them as a reference as you care for other patients with similar health concerns.

Critical Thinking Synthesis

Critical thinking is a reasoning process by which you use knowledge, reflect on previous experience, and integrate

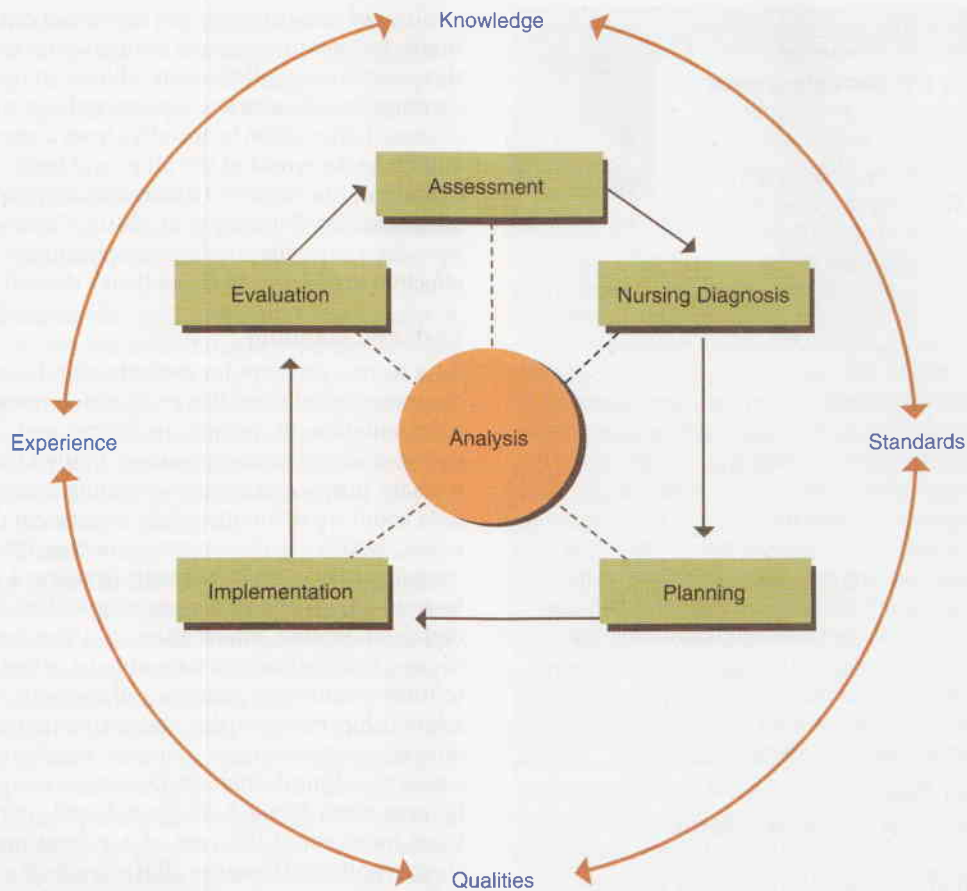


Figure 11-3 Synthesis of critical thinking with the nursing process competency.

professional practice standards to provide competent and ethical nursing care to patients (Figure 11-3). Thinking critically requires dedication and a desire to grow intellectually. For novice nurses, it is important to learn the steps of the nursing process and to incorporate the elements of the critical thinking model in your practice. The two processes are intertwined in making quality decisions about patient care. The key components of critical thinking are integrated into other chapters in this text to help you better understand its relationship to the nursing process and to making quality judgements and decisions about patient care.

❖ KEY CONCEPTS

- Critical thinking is a process acquired through learning and experience.
- Nurses who apply critical thinking in their work focus on options for solving problems and making decisions, rather than rapidly and carelessly adopting solutions.
- Following a procedure step by step without adjusting to a patient's unique needs is an example of basic critical thinking.
- In complex critical thinking, a nurse learns that alternative and perhaps conflicting solutions to problems exist.
- The critical thinking model combines a nurse's knowledge base, experience, competence in nursing process, qualities, and standards to explain how nurses make clinical judgements that are necessary for safe, effective nursing care.
- In diagnostic reasoning, you collect patient data and then logically develop a clinical judgement, such as a nursing diagnosis.
- When you face a clinical problem or situation and choose a course of action from several options, you are making a clinical decision.
- Clinical learning experiences are necessary for you to acquire clinical decision-making skills.
- You improve your clinical decision making by knowing your patients.
- Clinical decision making involves judgement that includes critical and reflective thinking and action and the application of scientific and practical knowledge.
- The nursing process is a blueprint for patient care that involves both general and specific critical thinking competencies in a way that focuses on the patient's unique needs.
- Critical thinking qualities help a nurse to know when more information is needed, to know when information is misleading, and to recognize personal knowledge limits.
- The use of intellectual standards during assessment ensures a complete database of information.
- Professional standards for critical thinking refer to ethical criteria for nursing judgements, scientific and practice criteria to be used for evaluation, and criteria for professional responsibility.
- Reflective journal writing gives you the opportunity to define and express clinical experiences in your own words.

- Drawing a concept map enables you to gain a broader and more complex understanding of your patient's complex health care needs.

❖ CRITICAL THINKING EXERCISES

1. You are meeting with an obese patient for the first time. She states that she has been successful in losing weight on several occasions but is frustrated by her inability to maintain her weight loss. She reports having tried "virtually every fad diet" and "multiple exercise programs." She admits that as her weight increases, she tends to be become less active. She has become increasingly reluctant to leave her home because of the negative reactions of other people. In listening to her story, you attempt to imagine what it would be like to be in her situation and to examine your biases and assumptions about people who are obese. Your goal is to begin to discuss potential options with her for dealing with her situation. Describe the level of critical thinking that is necessary in this scenario. How will your actions potentially assist in helping this patient develop an effective plan of action?
2. Mr. Yousif is a terminally ill patient receiving home care. His wife and son are asking you about his pain control. Mrs. Yousif is requesting that her husband's medication be increased, even if it means he will not be responsive. She does not want her husband to suffer. The son is vehemently opposed to too much narcotic and feels that his father is still able to make decisions for himself. Mr. Yousif remains alert much of the time and is able to talk with you about his feelings regarding death and his desire to die at home. He seems to appreciate your availability in talking with him. How might you use critical thinking to help the family resolve this complex problem?
3. Construct a concept map that illustrates your definition of professional nursing practice. What are the key components (i.e., assumptions, beliefs, values) of your definition? How are they related (i.e., linked) to each other? How has your definition of professional nursing practice changed since you first entered your nursing program? What factors contributed to this change? Try to incorporate these factors into your concept map.
3. A patient had hip surgery 24 hours ago. The nurse refers to the written plan of care, noting that the patient has a device collecting wound drainage. The physician is to be notified when the accumulation in the device exceeds 100 mL for the day. When the nurse enters the room, the nurse looks at the device and carefully notes the amount of drainage currently in the device. This is an example of
 1. Planning
 2. Evaluation
 3. Intervention
 4. Nursing diagnosis
4. The nurse asks a patient how she feels about her impending surgery for breast cancer. Before the discussion, the nurse reviewed the description in his textbook of loss and grief in addition to therapeutic communication principles. The critical thinking component involved in the nurse's review of the literature is
 1. Experience
 2. Problem solving
 3. Knowledge application
 4. Clinical decision making
5. As the nurse enters a patient's room, she observes that the intravenous line is not infusing at the ordered rate. The nurse checks the flow regulator on the tubing, looks to see whether the patient is lying on the tubing, checks the connection between the tubing and the intravenous catheter, and then checks the condition of the site where the intravenous catheter enters the patient's skin. She readjusts the flow rate, and the infusion begins at the correct rate. This is an example of
 1. Inference
 2. Reflection
 3. Problem solving
 4. Evidence-informed decision making
6. The nurse sits down to talk with her patient, who lost her sister two weeks ago. The patient reports that she is unable to sleep, feels very fatigued during the day, and is having trouble at work. The nurse asks her clarify the type of trouble, and the patient explains that she cannot concentrate or even solve simple problems. The nurse records the results of her assessment, describing the patient's problem as ineffective coping. This conclusion reflects the nurse's use of
 1. Inference
 2. Diagnostic reasoning
 3. Best practice guidelines
 4. Professional practice standards

❖ REVIEW QUESTIONS

1. You are teaching a 12-year-old boy how to self-administer insulin. After discussing the techniques and demonstrating an injection, you ask him to try it. After two attempts, it is obvious that he does not understand how to prepare the correct dose. You review your approach with the patient carefully and ask a colleague for her suggestions about how to improve your teaching skills. This is an example of
 1. Reflection
 2. Risk taking
 3. Patient assessment
 4. Care plan evaluation
2. A nurse uses an institution's procedure manual to confirm how to change a patient's nasogastric tubing. The level of critical thinking the nurse is using is
 1. Commitment
 2. Scientific method
 3. Basic critical thinking
 4. Complex critical thinking
7. In observing a new mother breastfeeding her baby, the public health nurse observes that the baby is fussy and is not sucking effectively. The nurse reviews the baby's record and finds that he has lost a considerable amount of weight since birth. The nurse conducts an assessment and notes that the baby has poor skin turgor. The mother reports that he urinates infrequently and sleeps only for very short periods of time between feedings. The nurse concludes that the baby is dehydrated and is at risk of becoming malnourished. This is an example of
 1. Inference
 2. Problem solving
 3. Diagnostic reasoning
 4. Applying nursing practice standards

✦ RECOMMENDED WEB SITES

Canadian Nurses Association: <http://www.cna-nurses.ca>

A wide range of valuable resources, including the *Code of Ethics for Registered Nurses* (CNA, 2008), can be found on the Web site of the Canadian Nurses Association. This Web site also links to the Web sites of each of the provincial and territorial professional nursing associations in Canada. Visit these Web sites and become familiar with the kinds of resources that are available to you. The position papers and other documents found on these Web sites demonstrate how Canadian nurse leaders have used critical thinking to explore important issues in nursing and nursing practice.

IHMC CMap Tools: A Modelling Kit: <http://cmap.ihmc.us>

This Web site not only provides an example of a concept map but also provides instruction about how to create one. It illustrates components of a concept map and their relationship to each other. Searching the Internet using the terms "concept maps" and "nursing" will provide numerous other examples.

Insight Assessment/California Academic Press: <http://www.insightassessment.com/articles.html>

A wide array of articles and case studies related to critical thinking, tools to measure your critical thinking skills, and other valuable resources can be found on this Web site. Many of these resources can be downloaded for free; others are available for purchase.

The Critical Thinking Community: <http://www.criticalthinking.org>

The section of this Web site titled "The Thinker's Guide Series" includes links to a number of short booklets that explore subjects such as critical thinking concepts and tools; improving your reading, writing, and study skills; and ethical reasoning.

Critical Thinking on the Web: A Directory of Quality Online Resources: <http://www.austhink.org/critical/index.htm>

This Web site links to a wide range of articles in which critical thinking is examined from a variety of perspectives, including nursing. It also contains links to a variety of tutorials that you can use to improve your critical thinking skills.

Critical Thinking Strategies: Concept Mapping: http://cord.org/txcollabnursing/onsite_conceptmap.htm

This Web site provides examples of the use of concept maps in nursing practice.

Student Resources: Critical Thinking Skills: <http://distance.uvic.ca/students/thinking.htm>

This online tutorial assists students in exploring the importance of critical thinking in reading, writing, reasoning, and making judgements.

Review Question Answers

1. 1; 2. 2; 3. 3; 4. 3; 5. 3; 6. 1; 7. 3

Rationales for the Review Questions appear at the end of the book.

Nursing Assessment and Diagnosis

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Canadian content written by S. Helen Fraser, RN, MN, Debbie A. Brennick, RN, MN, and Willena I. Nemeth, RN, MN

objectives

Mastery of content in this chapter will enable you to:

- Define the key terms listed.
- Discuss the steps of nursing assessment.
- Explain the relationship of critical thinking to assessment.
- Differentiate between subjective and objective data.
- Discuss the purposes of a client interview.
- Discuss how the use of interview techniques helps clients describe their health histories.
- Describe the components of a nursing history.
- Describe the relationship between data collection and data analysis.
- Explain the relationship between data interpretation, validation, and clustering.
- Conduct a nursing assessment.
- Differentiate between a nursing diagnosis, medical diagnosis, and collaborative problem.
- Discuss the relationship of critical thinking to the nursing diagnostic process.
- Describe the steps of the nursing diagnostic process.
- Develop a concept map.
- Explain how defining characteristics and the etiological process individualize a nursing diagnosis.
- Explain the benefit of using the NANDA International nursing diagnoses in practice.
- Describe sources of diagnostic errors.
- Identify nursing diagnoses from a nursing assessment.

key terms

- | | |
|--|------------------------------------|
| Actual nursing diagnosis, p. 166 | Implementation, p. 154 |
| Assessment, p. 154 | Inference, p. 155 |
| Client-centred plan of care, p. 167 | Interview, p. 158 |
| Clinical criteria, p. 165 | Medical diagnosis, p. 162 |
| Closed-ended questions, p. 159 | NANDA International, p. 165 |
| Collaborative problem, p. 163 | Nursing diagnosis, p. 163 |
| Concept map, p. 162 | Nursing health history, p. 156 |
| Cue, p. 155 | Nursing process, p. 153 |
| Data analysis, p. 161 | Objective data, p. 156 |
| Database, p. 154 | Open-ended questions, p. 159 |
| Defining characteristics, p. 165 | Planning, p. 154 |
| Diagnosis, p. 154 | Related factor, p. 167 |
| Diagnostic label, p. 166 | Review of systems, p. 157 |
| Etiology, p. 167 | Risk nursing diagnosis, p. 166 |
| Evaluation, p. 154 | Standards, p. 155 |
| Health-promotion nursing diagnosis, p. 166 | Subjective data, p. 156 |
| | Validation, p. 161 |
| | Wellness nursing diagnosis, p. 166 |

media resources

evolve WEBSITE

<http://evolve.elsevier.com/Canada/Potter/fundamentals/>

- Audio Chapter Summaries
- Examination Review Questions
- Glossary
- Student Learning Activities
- Weblinks

The nursing process is a problem-solving approach to identifying, diagnosing, and treating the health issues of clients. It is fundamental to how nurses practice. As a nursing student, you will learn the five steps of the nursing process—assessment, diagnosis, planning, implementation, and evaluation—as if they were a linear process. However, the steps are interrelated and overlapping (Chabeli, 2007) (Figure 12-1). The nursing process is considered to be a more dynamic, interactive process; in the clinical setting, practitioners move back and forth within the steps (Jarvis et al., 2009).

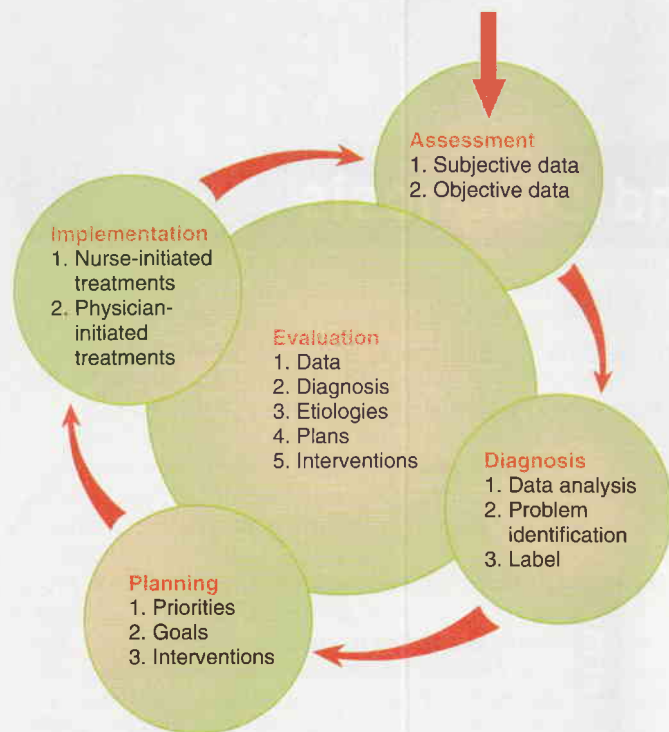


Figure 12-1 Five-step nursing process. **Source:** Lewis, S. L., Heitkemper, M. M., Dirksen, S. R., O'Brien, P. G., Barry, M. A., Goldsworthy, S., & Goodridge, D. (2010). *Medical-surgical nursing in Canada: Assessment and management of clinical problems* (2nd ed., p. 9, Fig. 4-1). Toronto: Elsevier Canada.

Consider the following scenario:

Following shift report, Lisa, a registered nurse on an orthopedic nursing unit, enters Ms. Devine's room. Ms. Devine is a 52-year-old woman who sustained an injury, a ruptured lumbar disc, in a fall two months ago. She is scheduled for a lumbar laminectomy this afternoon. When Lisa first observes Ms. Devine, she notes the client is moving in bed awkwardly and is grimacing when she turns. Ms. Devine looks up and states, "Oh, I am so glad you are here. [Sighs] The pain in my back seems worse, and I cannot get comfortable. I cannot sit at all, so I will stay in bed for now. I just dread having this surgery, I will be so glad when this is all over [looks away and avoids eye contact]." Lisa observes Ms. Devine's facial grimace and notes her sighing. She responds, "Ms. Devine, you obviously look uncomfortable and a bit upset. Let me ask you a few questions. Show me where the pain is. On a scale of 0 to 10, with 10 the worst pain ever and 0 no pain, how would you rate your pain? Does it become worse when you turn?" As Ms. Devine responds to the questions, Lisa analyzes the data and considers other relevant information, such as the client's medical diagnosis (ruptured lumbar disc) and knowledge of the alterations that the condition typically causes (e.g., sciatic pain and change in sensation of the lower extremities). Lisa decides that Ms. Devine has acute pain related to pressure on the spinal nerves. Lisa explains to Ms. Devine a plan to help relieve the discomfort. She then administers an ordered analgesic, repositions Ms. Devine, and discusses how Ms. Devine can practise relaxation exercises. Forty minutes later, Lisa returns to Ms. Devine's room to determine whether the pain is relieved and whether she wants to try the relaxation exercises.

Lisa applied the nursing process while caring for Ms. Devine. Each time you meet a client, you will apply the nursing process to provide appropriate and effective nursing care. The

process begins with the first step, **assessment**, the gathering and analysis of information about the client's health status. In the next step, **diagnosis**, you then make clinical judgements about the client's response to health problems in the form of nursing diagnoses. Once you establish appropriate nursing diagnoses, you create a plan of care. **Planning** includes interventions individualized to each of the client's nursing diagnoses. The next step, **implementation**, involves the actual performance of planned interventions. After administering interventions, you conduct an **evaluation** of the client's response and whether the interventions were effective. The nursing process is central to your ability to provide timely and appropriate care to your clients.

The nursing process is a variation of scientific reasoning that allows you to organize and systematize nursing practice. You learn to make inferences about the meaning of a client's response to a health problem or generalize about the patient's functional state of health. A pattern begins to form. For example, if Ms. Devine is having acute back pain, the data allow Lisa to infer that the client's mobility is limited. Lisa gathers more information (e.g., noting how the client moves and whether the client is able to walk, stand, and sit normally) until the client's problem is classified accurately: for example, as the nursing diagnosis *impaired physical mobility related to acute back pain*. The clear definition of the client's problems provides the basis for planning and implementing nursing interventions and evaluating the outcomes of care.

Critical Thinking Approach to Assessment

Assessment is the deliberate and systematic collection of data to determine a client's current and past health status and functional status and to determine the client's present and past coping patterns (Carpenito-Moyet, 2008). Nursing assessment consists of two steps:

- Collection and verification of data from a primary source (the client) and secondary sources (e.g., family, health providers, and client record)
- The analysis of all data as a basis for developing nursing diagnoses, identifying collaborative problems, and developing a plan of individualized care

The purpose of assessment is to establish a **database** about the client's perceived needs, health problems, and responses to these problems. In addition, the data reveal related experiences, health practices, goals, values, and expectations about the health care system.

When a plumber comes to your home to repair a problem you describe as a "leaking faucet," the plumber checks the faucet, its attachments to the water line, and the water pressure in the system to determine the actual malfunction. Similarly, you see clients who will present an initial health problem to you. You then proceed to observe each client's behaviour, ask questions about the nature of the problem, listen to the cues the client provides, and conduct a physical examination (see Chapter 31). Sometimes you also interview family members who are familiar with the client's health problem, and you review any existing medical record data. All of the data you collect form different sets or patterns of information that point to a diagnostic conclusion. Once a plumber knows the source of the faucet leak, he or she is able to repair the faucet. Similarly, once you know the nature and source of a client's health problems, you are able to provide interventions that will restore, maintain, or improve the client's health.

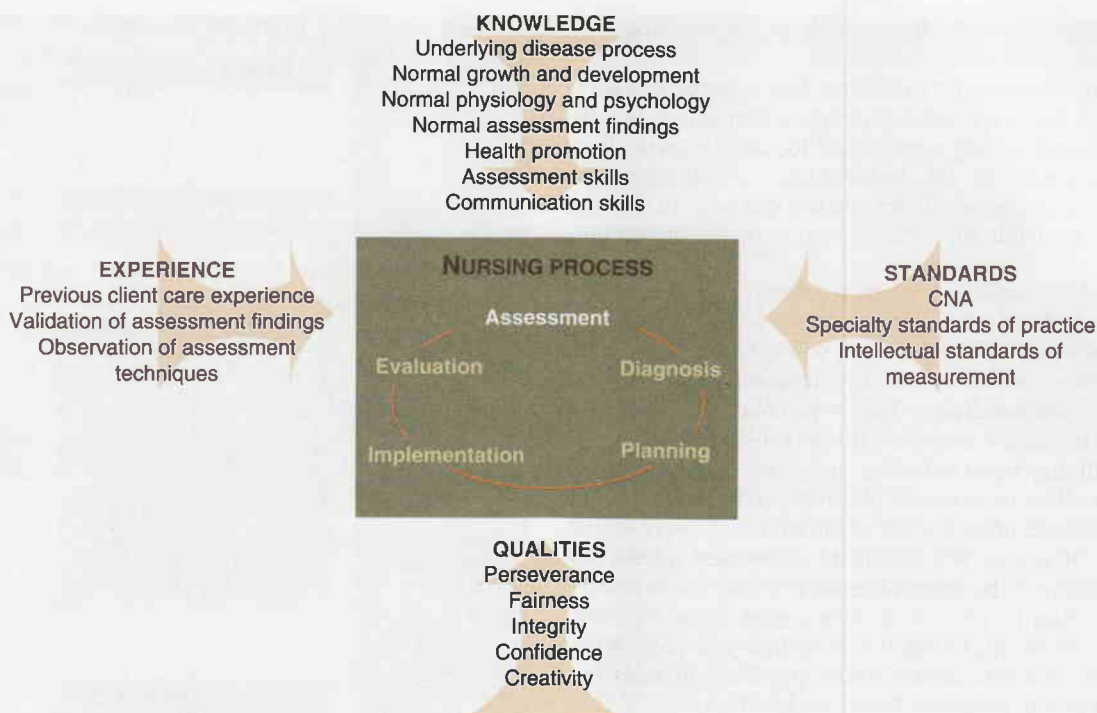


Figure 12-2 Critical thinking and the assessment process.

Critical thinking is important to good assessment (see Chapter 11). Critical thinking allows you to see the big picture when you form conclusions or make decisions about a client's health condition. While gathering data about a client, you synthesize relevant knowledge, recall prior clinical experiences, apply critical thinking **standards** and available evidence, and use standards of practice to direct your assessment in a meaningful and purposeful way (Figure 12-2). Your knowledge of the physical, biological, and social sciences enables you to ask relevant questions and collect history and physical assessment data relevant to the client's presenting health care needs. For example, by knowing that a client has a history of a ruptured lumbar disc, you know to ask whether the client has sciatic pain (characteristic pain that radiates or spreads from the buttocks down the leg) and to question how the discomfort affects the client's ability to walk or sit, inasmuch as these are common symptoms of disc disease. By using good communication skills and critical thinking intellectual standards, you can collect complete, accurate, and relevant data.

Prior clinical experience contributes to the skills of assessment. For example, if you have cared for a client with back pain, you know the pain is sometimes disabling and limits the client's normal motion. Thus, you thoroughly assess the extent to which the pain affects the current client's ability to walk normally and to perform daily living activities. By validating abnormal assessment findings and personally observing assessments performed by skilled professionals, you become competent in assessment. You also learn to apply standards of practice and accepted standards of "normal" for physical assessment data when assessing clients. Use of critical thinking qualities such as creativity, perseverance, and confidence ensure that you compile a comprehensive database.

Data Collection

As you begin a client assessment, think critically about what to assess. On the basis of your clinical knowledge and experience and your client's health history and responses, determine what questions or measurements are appropriate. When you first meet a client, make a quick observational overview or screening. Usually an overview is based on a treatment situation. For example, a community health nurse assesses the neighbourhood and the community of the client; an emergency room nurse uses the circulation-airway-breathing (CAB) sequence; and an oncology nurse focuses on the client's symptoms from disease and from treatment and grief response (Heart and Stroke Foundation of Canada, 2010). In the case of Ms. Devine, Lisa first focuses on the nature and severity of her client's pain, the risk of limited mobility, and the extent of the client's anxiety. She will later expand her assessment to determine whether Ms. Devine has been psychologically prepared for her upcoming surgery.

You learn to differentiate important data from the total data collected. A **cue** is information that you obtain through use of the senses. An **inference** is your judgement or interpretation of those cues. For example, a client's crying is a cue that possibly implies fear or sadness. You ask the client about any concerns and make known any nonverbal expressions you notice in an effort to direct the client to share his or her feelings. It is possible to miss important cues when you conduct an initial overview. However, using creativity, flexibility, inquisitiveness, intuition, and open-mindedness can help you become aware of unusual or unexpected cues (Lunney, 2009). Always try to interpret cues from the client to know how in-depth to make your assessment. Assessment is dynamic and allows you

to freely explore relevant client problems as you discover them.

Begin your assessment by documenting a comprehensive **nursing health history**, a detailed database that allows you to plan and carry out nursing care to meet the client's needs. Box 12-1 presents guidelines for documenting a comprehensive history. This approach encourages you to focus on your client's strengths and available supports, as well as on the presenting problem.

As you collect data, you begin to categorize cues, make inferences, and identify emerging patterns, potential problem areas, and solutions. To do this well, you critically anticipate patterns, problems, and solutions, which means you try to stay a step ahead of the assessment. Before you make an inference, remember to document cues that support the inference. Your inferences will direct you to further questions. Once you ask a question of a client or make an observation, the information "branches" to an additional series of questions or observations (Figure 12-3). If you do not anticipate assessment questions, your assessment may be incomplete, or you may fail to recognize cues and dismiss relevant problem areas. Knowing how to probe and frame questions is a skill that you hone with experience. You learn to decide which questions are relevant to a situation and to interpret the data accurately.

Types of Data

Data can be obtained from two primary sources: subjective and objective. **Subjective data** are your clients' verbal descriptions of their health problems. Only clients provide subjective data. For example, Ms. Devine's report of back pain and her expression of dread over anticipating surgery are subjective findings. Subjective data usually include feelings, perceptions, and self-report of symptoms. Although only clients provide subjective data relevant to their health condition, be aware that the data sometimes reflect physiological changes, which you further explore through objective data collection.

Objective data are observations or measurements of a client's health status. Inspection of the condition of a wound, a description of an observed behaviour, and the measurement of blood pressure are examples of objective data. The measurement of objective data is based on an accepted standard, such as the Celsius measure on a thermometer, centimetres on a measuring tape, or known characteristics of behaviours (e.g., anxiety or fear). When you collect objective data, apply critical thinking intellectual standards (e.g., whether the data are clear, precise, and consistent) so that you can correctly interpret your findings.

Sources of Data

As a nurse, you obtain data from a variety of sources. Each source of data provides information about the client's level of wellness, strengths, anticipated prognosis, risk factors, health practices and goals, and patterns of health and illness.

Client. A client is usually your best source of information. Clients who are conscious, alert, and able to answer questions correctly provide the most accurate information about their health care needs, lifestyle patterns, current and past illnesses, perception of symptoms, and changes in activities of daily living. Consider the setting for your assessment. A client experiencing acute symptoms in an emergency department will not offer as much information as one who comes to an outpatient clinic for a routine checkup. Always be attentive, and show a caring presence with the client (see Chapter 18). Let the client

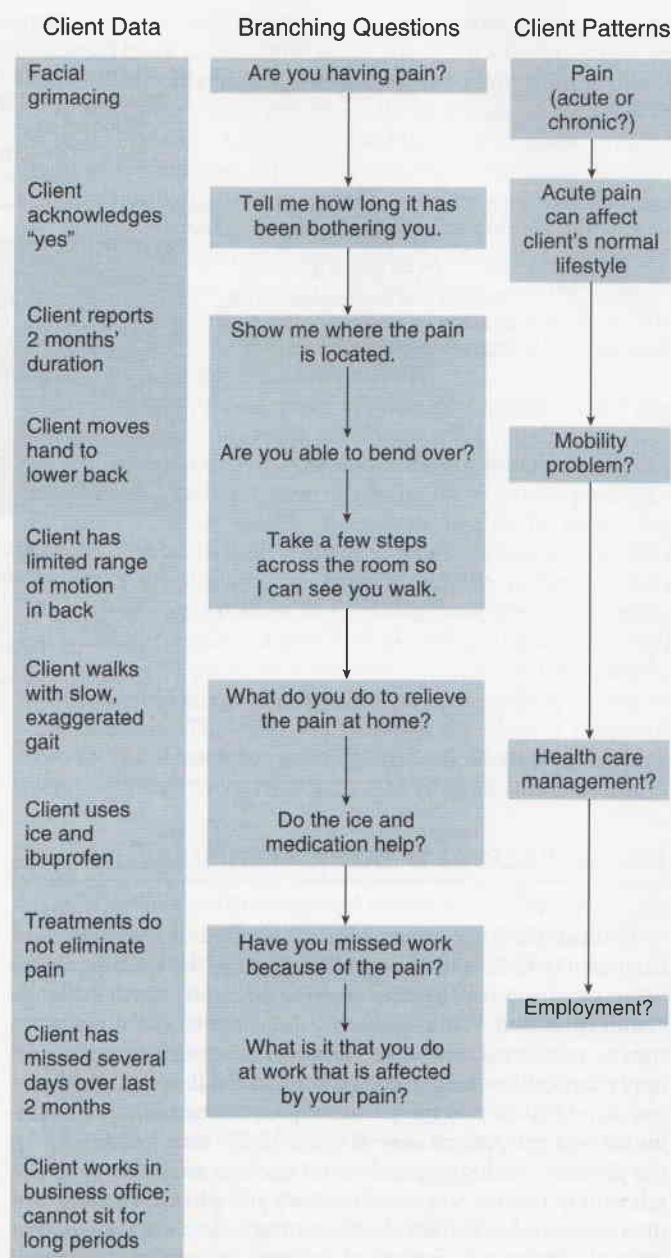


Figure 12-3 Example of branching logic for selecting assessment questions.

know you are interested in what he or she has to say. Clients are less likely to reveal the nature of their health care problems fully when nurses show little interest or are easily distracted by activities around them.

Family and Significant Others. Family members and significant others are primary sources of information for infants or children, critically ill adults, and mentally handicapped, disoriented, or unconscious clients. In cases of severe illness or emergency situations, families are sometimes the only available sources of information for nurses and clients' health care providers. The family and significant others are important secondary sources of information. They confirm findings that a client provides (e.g., whether a client takes medications regularly at home or how well the client sleeps or eats). Include interviewing the family when appropriate.

► BOX 12-1

Guidelines for Documenting a Comprehensive Nursing Health History

A. Identifying Data

Name, age, sex, date, and place of birth

B. Source of History

Relationship to client, any special circumstances such as use of interpreter

C. Reason for Health History Interview

Explain why you are interviewing the client at the present time (e.g., the client has just been admitted to an inpatient unit or clinic).

D. Current State of Health

General state of physical, mental, social, and spiritual health and health goals. If an illness is present, gather data about the nature of the illness by conducting a symptom analysis (see Chapter 31).

E. Developmental Variables

- Relationship status: single, married, partner, separated, widowed, divorced
- Number of children
- Developmental stage (see Chapter 21)
- Current occupation
- Significant life experiences (e.g., education, previous occupations, financial situations, retirement, coping or stress tolerance, and measures normally used to reduce stress)
- Safety hazards (e.g., biological, chemical, ergonomic, physical, psychosocial, reproductive)
- Housing, environmental hazards (e.g., type of housing, location, living arrangements; specific hazards in the home or community)
- Safety measures (e.g., use of seat belts, helmets, presence of smoke detectors and fire extinguishers, and other measures related to specific hazards of work, community, and home)

F. Psychological Variables

Mental processes, relationships, support systems, statements regarding client's feelings about self

G. Spiritual Variables (see Chapter 27)

Rituals, religious practices, beliefs about life, client's source of guidance in acting on beliefs, and the relationship with family in exercising faith

H. Sociocultural Variables

- Culture: values, beliefs and practices related to health and illness (see Chapter 9)
- Primary language and other languages spoken
- Recreation (exercise, hobbies, socializing, use of leisure time)
- Family and significant others, such as authorized representative, i.e., enduring power of attorney. Include family composition, relationships, special problems experienced by family, client's and family's response to stress, roles, and support systems. The family history provides information about family structure, interaction, and function that may be useful in planning care. For example, a cohesive, supportive family can help a client adjust to an illness or disability and should be incorporated into the plan of care. However, if the client's family members are not supportive, it may be better not to involve them in care. Outline a family tree (genogram; see Chapter 19) to determine whether the client is at risk for genetic illnesses and to identify areas of health promotion and illness prevention.

I. Physiological Variables (Body Structure and Function)**History of Past Illnesses and Injuries**

Including dates

Current Medications

Prescribed, over-the-counter, or illicit drugs. Include name, dosage, schedule, duration of and reason for use, and expected effects and side effects; if illicit drug, include type, amount, response, adverse reaction, drug-related accidents or arrests, attempts to quit.

Review of Systems

The **review of systems** is a systematic method for collecting data on all body systems. Not all questions in each system may be covered in every history. Nevertheless, some questions about each system are included, particularly when a client mentions a symptom or sign. The nurse begins with questions about the usual functioning of each body system and any noted changes and follows with specific questions such as the ones noted as follows for each system. Nurses also focus on measures taken by the client to promote and maintain health and those to prevent illness or injury. The following are included in the review of systems:

- **General manifestation of symptoms:** fever, chills, malaise, pain, sleep patterns and disturbances, fatigue, recent alterations in weight
- **Integumentary:** itching, colour or texture change, lesions, dryness and use of creams or lotions, changes in hair or nails
- **Ocular:** visual acuity, blurring, eye pain, recent change in vision, discharge, excessive tearing, date of last examination
- **Auditory:** hearing loss, pain, discharge, dizziness, perception of ringing in ears, wax
- **Upper respiratory:** nosebleeds, nasal discharge, nasal allergies, sinus problems, frequency of colds and usual method of treatment, sore throat and usual type of home remedy, hoarseness or voice changes
- **Lower respiratory:** use of tobacco (amount and number of years of smoking; exposure to tobacco smoke; if smoker, attempts to stop smoking), exposure to airborne pollutants, cough, sputum, wheezing, shortness of breath, tuberculosis test and results, date of last chest X-ray examination
- **Breasts and axillae:** rashes, lumps, discharge, pain, breast self-examination practices
- **Lymphatic:** pain, swelling
- **Cardiovascular:** chest pain or distress, precipitating causes, timing and duration, relieving factors, dyspnea, orthopnea, edema, hypertension, exercise tolerance, circulatory problems, varicose veins
- **Gastrointestinal:** appetite, digestion, food intolerance, dysphagia, heartburn, abdominal pain, nausea or vomiting, bowel regularity, use of laxatives, change in stool colour or contents, constipation or diarrhea, flatulence, hemorrhoids, rectal examinations
 - a. Dietary pattern: calculate number of servings per day of each of the food groups, using *Canada's Food Guide to Healthy Eating* (<http://www.nms.on.ca/pdfs/Food%20Guide.pdf>) for serving size (see Chapter 42); restrictions to food choice; special diets; use of salt; calculate adequacy of fluid intake (should be 30 to 40 mL of fluid per kilogram of body weight); indicate sources of calcium and amounts per day; alcohol use (average number of ounces per week, recent changes in pattern of consumption)
- **Urinary:** painful urination; blood, stones, or pus in urine; bladder or kidney infections; difficulty stopping urinary stream; dribbling or hesitancy; sudden feeling of need to urinate; frequent urination; nocturia (having to get up to void during the night); incontinence (see Chapter 43).
- **Genital and reproductive:**
 - a. Male: puberty onset, difficulty with erections, emissions, testicular pain, libido, infertility, urethral discharge, genital lesions, exposure to and history of sexually transmitted

Continued

► BOX 12-1 Guidelines for Documenting a Comprehensive Nursing Health History—cont'd

- infections, testicular self-examinations, testicular lump or pain, hernias, sexual preference, birth control method, and safer sex practices used
- b. Female: menses (onset, duration, regularity, flow, discomfort, date of most recent menstrual period), age at menopause (occurrence of hot flashes, night sweats, vaginal discharge), date of last Pap smear, pregnancies (number, miscarriages, abortions), exposure to and history of sexually transmitted infections, sexual preference, birth control method, and safer sex practices used
- **Musculoskeletal:** pain, joint stiffness or swelling, restricted motion, muscle wasting, weakness, general mobility, use of mobility aids, ability to perform activities of daily living
- **Neurological:** injury, headaches, dizziness, fainting, abnormalities of sensation or coordination, tremors, seizures
- **Endocrine:** excessive sweating, thirst, hunger, or urination; intolerance of heat or cold; changes in distribution of facial hair; thyroid enlargement or tenderness; unexplained weight change; change in glove or shoe size
- **Hematological:** anemia; bruise or bleed easily; transfusions
- **Psychiatric:** depression, mood changes, difficulty concentrating, nervousness, anxiety, suicidal thoughts, irritability
- **Immunological:** communicable diseases (indicate disease and age at or year of onset), immunization status (indicate year of most recent immunization), allergies (known allergens and reactions; MedicAlert identification worn)

Adapted from Skillen, D. L., & Day, R. A. (2004). *A syllabus for adult health assessment*. Edmonton: University of Alberta, Faculty of Nursing.

Remember that a client does not always wish you to question the family.

Spouses or close friends often sit in during an assessment and provide their view of the client's health problems or needs. They not only supply information about the client's current health status but are able to tell when changes in the client's status occurred. Family members are often well informed because of their experiences living with the client and observing how health problems affect daily living activities. Family and friends make important observations about the client's needs that can affect the way care is delivered (e.g., how a client eats a meal or how a client makes choices).

Health Care Team. You frequently communicate with other health care team members in gathering information about clients. In the acute care setting, the change-of-shift report is the way for nurses from one shift to communicate information to nurses on the next shift (see Chapter 15). When nurses, physicians, physiotherapists, social workers, or other staff consult about a client's condition, they typically have information about the client. This information may include how the client is interacting within the health care environment, the client's physical or emotional reactions to treatment, the result of diagnostic procedures or therapies, and how the client responds to visitors. Every member of the team is a source of information for identifying and verifying information about the client.

Medical Records. The medical record is a source of the client's medical history, laboratory and diagnostic test results, current physical findings, and the medical treatment plan. Data in the records offer baseline and ongoing information about the client's response to illness and progress to date. Information in a client's record is confidential. The medical record is a valuable tool for checking the consistency and similarities of personal observations.

Literature. You complete your assessment database by reviewing nursing, medical, and pharmacological literature about a client's present health status. This review increases your knowledge about the client's diagnosed problems, expected symptoms, treatment, prognosis, and established standards of therapeutic practice. A knowledgeable nurse obtains relevant, accurate, and complete information for the assessment database.

Nurse's Experience. Benner et al. (2010) assert that integration of evidence-based knowledge and good clinical

reasoning is essential to elicit and process information that will lead the nurse to deliver relevant therapeutic interventions. A nurse's expertise develops after testing and refining propositions, questions, and principle- or standard-based expectations. For example, after Lisa has cared for Ms. Devine, she has learned some lessons. Lisa will more quickly recognize the behaviour the client showed while in acute pain when she cares for the next client with similar health problems. Lisa will also note how positioning techniques helped Ms. Devine relax and ameliorated her discomfort. Practical experience and the opportunity to make clinical decisions strengthen your critical thinking.

Methods of Data Collection

As a nurse, you use the client interview, nursing health history, physical examination findings, and results of laboratory and diagnostic tests to establish a client's assessment database.

Interview. The first step in establishing a database is to collect subjective information by interviewing the client. An **interview** is an organized conversation with the client. The initial formal interview involves obtaining the client's health history and information about the current illness. During the initial interview, you have the opportunity to do the following:

- Introduce yourself to the client, explain your role, and explain the role of other health care providers during care.
- Establish a caring therapeutic relationship with the client.
- Obtain insight about the client's concerns and worries.
- Determine the client's goals and expectations of the health care system.
- Obtain cues about which parts of the data collection phase necessitate further in-depth investigation.

You and the client become partners during the interview, rather than you controlling the interview. An interview consists of three phases, similar to that of a therapeutic relationship: orientation, working, and termination.

A successful interview requires preparation. Collect any available information about the client, and then create a favourable environment for the interview. An environment in which the client is comfortable and relaxed helps you conduct a good interview. Some clients interviewed at home prefer that the interview take place in a bedroom, away from other family members, or in the living room, with a spouse present. Remember to let a client decide whether to involve the family. Finally,

select a place private enough to allow the client to be comfortable when providing personal information.

Orientation Phase. During the orientation phase of the interview, you introduce yourself, describe your position, and explain the purpose of the interview. Explain to clients why you are collecting data (e.g., for a nursing history or for a focused assessment) and assure them that any information obtained will remain confidential and will be used only by health care providers.

After making Ms. Devine more comfortable, Lisa decides that it is time to get to know her client better. Lisa reviews the interview process and its objectives, confidentiality, and length. "I want to spend some time better understanding your back pain and then what you know about your surgery. If you are comfortable, I would like to spend about 10 minutes discussing this with you. Everything you share will be confidential." Lisa and Ms. Devine agree mutually on the interview time.

LISA: Now, I want to ask you some questions about your health so we can plan your care together. Before we get started, do you have any questions for me?

MS. DEVINE: Yes. I know they plan to remove the disc in my back. It has been hurting so bad. I can't even bend over. Is there a chance I could be paralyzed?

LISA: Tell me what your doctor has explained about surgery.

MS. DEVINE: She has told me that I have a, what was it called, a herniated disc. She said it is pinching nerves in my back. Well, if it pinches nerves, could I not become paralyzed? She did tell me that she has done this procedure many times before.

LISA: A herniated disc is serious. The disc is normally situated between two vertebrae, but in your case it is now pinching on your spinal nerves. That is why you have so much discomfort. Your surgery is aimed at removing pressure on your nerves. I would suggest you talk with your doctor about your concerns before going into surgery.

MS. DEVINE: Okay, that makes me feel a little better. I have some important things going on at my work. My husband and I own our own business. I just want this to be over.

LISA: Tell me more about your pain.

Working Phase. In the working phase of the interview, you gather information about the client's health status. Remember to stay focused, orderly, and unhurried. Use a variety of communication strategies such as active listening, paraphrasing, and summarizing to promote a clear interaction (see Chapter 17). The use of open-ended questions encourages clients to describe their health histories in detail.

Use **open-ended questions** whenever you are not sure what the answer will be and when you want the description in the client's own words (Box 12-2). Remember that **closed-ended questions** can all be answered by yes or no (or a choice of answers that you provide), and limit these to issues in which you do not need additional information from the client.

During the working phase, obtain a nursing health history by exploring the client's current illness, health history, and expectations of care. The objective for collecting a health history is to identify patterns of health and illness, risk factors for physical and behavioural health problems, changes from normal function, and available resources for adaptation. The initial interview is normally the most extensive. Ongoing interviews, which occur each time you interact with your client, do not need to be as extensive; their purpose is to update the client's status and focus more on changes in previously identified ongoing and new problems. An example of Lisa's interview techniques is as follows:

► BOX 12-2

Examples of Open- and Closed-Ended Questions

Open-Ended Questions

Tell me how you are feeling.

Your discomfort affects your ability to get around in what way?

Describe how your wife has been helping you.

Give me an example of how you get relief from your pain at home.

Closed-Ended Questions

Do you feel as if the medication is helping you?

Who is the person who helps you at home?

Do you understand why you are having the X-ray examination?

Has the warm compress given you relief from your back pain?

Are you having pain now?

On a scale of 0 to 10, how would you rate your pain?

LISA: Tell me, Ms. Devine, about your back pain. [Open-ended question]

MS. DEVINE: Sometimes it is really sharp, especially when I stand and try to walk.

LISA: On a scale of 0 to 10, with 0 being no pain and 10 being the worst imaginable, how would you rate your pain when it becomes sharp? [Close-ended question]

MS. DEVINE: Oh, it can be bad; I would rate it an 8 or 9.

LISA: Point to where you notice the pain. [Asking for specificity]

MS. DEVINE: [points to her lower sacral area] It hurts here, and I also get a deep burning pain in my right buttock.

LISA: Can you tell me if anything else aggravates the pain?

MS. DEVINE: This morning I sneezed and thought I was going to faint. Then I could feel the pain go down my right leg.

LISA: Does anything else worsen the pain? [Probes for completeness]

MS. DEVINE: Well, just about any way I move tends to make my back hurt.

LISA: Any way? [Clarification]

MS. DEVINE: It hurts when I turn or twist. If I lie flat, it does not bother me.

LISA: In what way has it limited you in your usual activities? [Open-ended question]

MS. DEVINE: Well, I have not been able to work. I went back about a month ago, but I was miserable when I tried to sit down. I could not tolerate the discomfort.

Termination Phase. As in the other phases of the interview, termination requires skill on the part of the interviewer. Give your client a clue that the interview is coming to an end. For example, say, "I want to ask just two more questions" or "We'll be finished in about two minutes." This helps the client maintain direct attention without being distracted by wondering when the interview will end. This approach also gives the client an opportunity to ask questions. When concluding an interview, summarize the important points and ask the client whether the summary was accurate. End the interview in a friendly manner, telling the client when you will return to provide care; for example:

"Thank you, Ms. Devine. You have given me a good picture of your back problem and what you have been told about surgery. I think pain control will be a priority before and after your surgery. Because this is your first time in the hospital, I want to be sure I explain whatever

you would like to know. I am going to return in about an hour and talk with you about the surgery and what to expect. Can I do anything for you now?"

A skillful interviewer adapts interview strategies on the basis of the client's responses. You successfully gather relevant health data when you are prepared for the interview, and you are able to carry out each interview phase with minimal interruption.

Cultural Considerations in Assessment

As a professional nurse, it is important to conduct any assessment with cultural competence and cultural safety (see Chapter 9). This involves a conscientious understanding of your client's culture so that you can offer better care within differing value systems and act with respect and understanding without imposition of your own attitudes and beliefs (Seidel et al., 2011). Good communication techniques are important when assessing a client whose culture is different from your own. Communication and culture are interrelated in the way feelings are expressed verbally and nonverbally. If you can learn the variations in how people of different cultures communicate, you will probably be able to gather more accurate information from clients. For example, the Spanish and French use firm eye contact when speaking. However, this is considered rude or immodest by certain Asian or Middle Eastern cultures. North Americans often tend to let the eyes wander (Seidel et al., 2011). By using the right approach with eye contact, for example, you demonstrate respect for your client, and the client is probably encouraged to share more information.

When you interact to assess any specific client, first know your own cultural self. Cultural awareness can be achieved by engaging in self-reflection of your biases and feelings (see Chapter 9). You need to avoid forming a sense of the client on the basis of prior information about the client's culture. Instead, draw upon your knowledge and then ask questions in a constructive and probing way to allow you to truly understand the client.

Nursing Health History

You conduct a nursing health history during either your initial contact or an early contact with a client. The history is a major component of assessment. Although many health history forms are structured, you learn to use the questions as starting points. A good assessor learns to refine and broaden questions as needed in order to correctly assess the client's unique needs. Time and client priorities determine how complete a history is. Identify patterns of information about a client's health and illness by collecting data about all health dimensions (see Box 12-1). Incorporating data from all dimensions allows you to develop a complete plan of care.

Family History

The purpose of collecting the family history is to obtain data about immediate and blood relatives. The objectives are to determine whether the client is at risk for illnesses of a genetic or familial nature and to identify areas of health promotion and illness prevention (see Chapter 20). The family history also provides information about family structure, interaction, and function that is often useful in planning care (see Chapter 19). For example, a close, supportive family will help a client adjust to an illness or disability, and so you incorporate information from the family into the plan of care. If the client's family is

not supportive, however, it is better to not involve family members in care. Stressful family relationships are sometimes a significant barrier when you try to help clients with problems involving loss, self-concept, spiritual health, and personal relationships.

Documentation of History Findings

As you conduct the nursing health history, record your assessment in a clear, concise manner, using appropriate terminology. Standardized forms make it easy to enter data as the client responds to questions. In settings that have computerized documentation, entry of assessment data is very easy. A clear, concise record is necessary for use by other health care providers (see Chapter 15). Regardless of the model used in a documentation system, you want a thorough database that provides historical and current information about the client's health. This information then becomes the baseline against which you evaluate any future changes.

Physical Examination

A physical examination is an investigation of the body to determine its state of health. A physical examination involves use of the techniques of inspection, palpation, percussion, auscultation, and smell (see Chapter 31). A complete examination includes measurements of a client's height, weight, and vital signs and a head-to-toe examination of all body systems. By performing actual hands-on physical assessment, you gather valuable objective information that helps in forming accurate diagnostic conclusions. Always conduct an examination with sensitivity and competence to prevent your client from becoming anxious.

Observation of Client Behaviour. Throughout an interview and physical examination, it is important for you to observe a client's verbal and nonverbal behaviours closely. The information enhances your objective database. You learn to determine whether data obtained by observation matches what the client verbally communicates. For example, if a client expresses no concern about an upcoming diagnostic test but shows poor eye contact, shakiness, and restlessness, all suggestive of anxiety, then verbal and nonverbal data conflict. Observations direct you to gather additional objective information to form accurate conclusions about the client's condition. An important aspect of observation includes a client's level of function: the physical, developmental, psychological, and social aspects of everyday living. Observation of the level of function differs from observations you make during an interview. Observation of level of function involves watching what a client does, such as eating or making a decision about preparing a medication, rather than what the client tells you he or she can do. Observation of function can occur in the home or in a health care setting during a return visit.

Diagnostic and Laboratory Data. The results of diagnostic and laboratory tests reveal or clarify alterations questioned or identified during the nursing health history and physical examination. For example, during the history documentation, the client reports having a bad cold for six days and at present has a productive cough with brown sputum and mild shortness of breath. On physical examination, you notice an elevated temperature, increased respirations, and decreased breath sounds in the right lower lobe. You review the results of a complete blood cell count and note that the white blood cell count is elevated (indicating an infection). In addition, the radiologist's report of a chest X-ray examination shows the

presence of a right lower lobe infiltrate. Such findings combined are suggestive of the medical diagnosis of pneumonia and the associated nursing diagnosis of *impaired gas exchange*.

Some clients collect and monitor laboratory data in the home. For example, clients with diabetes mellitus often perform daily blood glucose monitoring. Ask clients about their routine results to determine their responses to illness and elicit information about the effects of treatment measures. Compare laboratory data with the established norms for a particular test result, age group, and gender.

Interpreting Assessment Data and Making Nursing Judgements.

The successful analysis and interpretation of assessment data requires critical thinking. When you correctly analyze data, you recognize patterns that lead you to make necessary clinical decisions about your client's care. These decisions are in the form of either nursing diagnoses or collaborative problems that require treatment from several disciplines (Carpenito-Moyet, 2008). When you critically think about interpreting assessment information, you determine the presence of abnormal findings, what further observations you need to clarify information, and the client's health problems.

Data Validation. Before you begin analyzing and interpreting data, validate the collected information you have, in order to avoid making incorrect inferences (Carpenito-Moyet, 2008). **Validation** of assessment data is the comparison of data with another source to determine data accuracy. For example, you observe a client crying and logically infer it is related to hospitalization or a medical diagnosis. Making such an initial inference is not wrong, but problems result if you do not validate the inference with the client. Instead, say, "I notice that you have been crying. Can you tell me about it?" By questioning the client, you will discover the real reason for the crying behaviour. Ask your client to validate the information obtained during the interview and history. Validate findings from the physical examination and observation of client behaviour by comparing data in the medical record and by consulting with other nurses or health care team members. Often family or friends are able to validate your assessment information. Validation opens the door for gathering more assessment data because it involves clarifying vague or unclear data. On occasion, you need to reassess previously covered areas of the nursing history or gather further physical examination data. Continually analyze and think about a client's database to make concise, accurate, and meaningful interpretations. Critical thinking applied to assessment enables you to fully understand the client's problems, to judge the extent of the problems carefully, and to discover possible relationships between the problems.

Lisa gathered initial data about the character of Ms. Devine's back pain. She applied critical thinking in her assessment as she considered what she knew about ruptured lumbar discs and the anticipated type of symptoms that clients experience. As she assessed Ms. Devine, she applied intellectual standards, obtaining information that was precise (location of pain), consistent and accurate (use of pain rating scale), and complete (probing for factors that worsen pain). Lisa learned additional information about Ms. Devine's concerns about surgery. Ms. Devine tells Lisa, "I hope the surgery goes well. You know, I have a friend who had back surgery, and she took a long time to recover. I want to get back to work without a long absence. If this had just not happened—why did I have to fall?" Lisa could make several inferences from this information, but she applies the critical thinking attitude of discipline and stays

► BOX 12-3 Steps of Data Analysis

1. Recognize a pattern or trend by cues:
 - Turns slowly
 - Is unable to bend over
 - Walks with hesitation
2. Compare with normal standards:
 - Has normal range of motion
 - Initiates movement without hesitation
3. Make a reasoned conclusion:
 - Has limited mobility
 - Has reduced activity level

focused to ensure her assessment is accurate and comprehensive. She validates her inferences with Ms. Devine: "You sound anxious about having surgery. You know of others who have had difficult outcomes after surgery. Do you think you are uncertain about what to expect?" Ms. Devine confirms Lisa's assessment: "Yes, I am worried. I have never been in a hospital, as you know, and I feel I do not know what that involves. I am a person who likes to have information, so I can make the right decisions and know what to do."

Analysis and Interpretation. After you collect extensive information about a client, you analyze and interpret the data. You begin analysis by organizing the information into meaningful and usable clusters, keeping in mind your client's response to illness. A data cluster is a set of signs or symptoms that you group together in a logical way. During data clustering, organize data and focus attention on client functions for which support or assistance for recovery is needed. **Data analysis** involves recognizing patterns or trends in the clustered data, comparing them with standards, and then establishing a reasoned conclusion about the client's responses to a health problem (Box 12-3). Patterns of meaning begin to form, enabling you to make inferences about client problems.

Through reasoning and judgement, you decide what information explains the client's health status. At times, you need to gather additional information to clarify your interpretation. For example, Ms. Devine told Lisa that she had not been in a hospital and did not know what that involved. Lisa inferred or guessed that Ms. Devine had limited knowledge about the laminectomy and the associated nursing care. Instead of making that conclusion, Lisa sought further information by asking, "Tell me what your doctor has told you about your surgery." Ms. Devine related, "Well, I know the doctor is going to remove something between my vertebrae. She said I will be in the hospital about two or three days." Lisa asked, "Has anyone talked with you about your care after surgery?" Ms. Devine replied, "No, not really. I have several questions I would like to ask about it." Lisa listened to the additional information provided by Ms. Devine. In looking for patterns of data, Lisa decided that Ms. Devine had a knowledge deficiency because of her limited preparation for the surgery but was interested in learning. If you are successful in clustering data well in your analysis, you will become proficient in identifying individualized nursing diagnoses and in identifying collaborative problems (see Figure 12-6).

During clustering, a cue or an individual sign, symptom, or finding will alert you more than others do. Such cues are especially helpful in identifying nursing diagnoses. In time, you will become experienced in recognizing clusters that indicate problems such as pain, anxiety, or immobility.

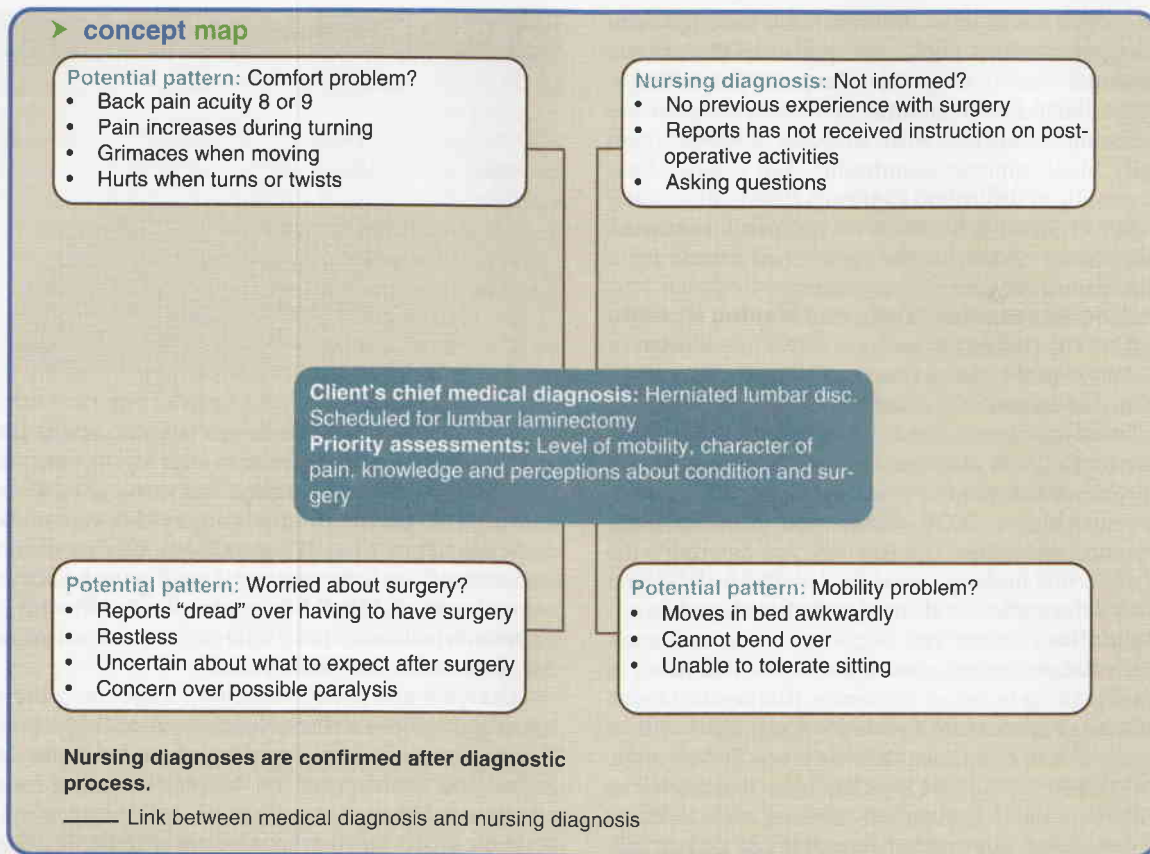


Figure 12-4 Concept map for Ms. Devine's nursing assessment findings.

Data Documentation

Data documentation is the last part of a complete assessment. The timely, thorough, and accurate documentation of facts is necessary when clients' data are recorded. If you do not record an assessment finding or problem interpretation, that information is lost and unavailable to anyone else caring for the client. If specific information is lacking, the person reading the report is left with only general impressions. Observation and recording of client status is a legal and professional responsibility. Recording factual information is easy after it becomes a habit. The basic rule is to record all observations. When you record data, pay attention to facts, and make an effort to be as descriptive as possible. Anything heard, seen, felt, or smelled should be reported exactly. Record objective information in accurate terminology (e.g., "weighs 77.3 kg," "abdomen is soft and non-tender to palpation"). Record subjective information from a client in quotation marks. When entering data, do not generalize or form judgements through written communication. Conclusions about such data become nursing diagnoses and thus must be accurate. As you gain experience and become familiar with clusters and patterns of signs and symptoms, you will conclude the existence of the correct problem. Clustering helps make documentation more concise and focused. (Review Chapter 15 for details on documentation.)

Concept Mapping

Most of the clients you care for have more than one health problem. A **concept map** is a visual representation that allows you to graphically show the connections between a client's

health problems. It promotes critical thinking by fostering a holistic view of the client and identifying linkages between the multiple problems affecting the client (Hicks-Moore & Pastirik, 2006). Concept mapping may help nursing students bridge the gap between theory and practice in the clinical setting (Senita, 2008). The visual image of clients as holistic, multidimensional, and complex serves as a starting point for the development of a comprehensive, individualized care plan (Taylor & Wros, 2007).

Figure 12-4 shows the first step in a concept map that Lisa will develop for Ms. Devine as a result of her nursing assessment.

Nursing Diagnosis

After you assess a client thoroughly to compile a database, the next step of the nursing process is to form diagnostic conclusions that determine the nursing care that a client receives (Figure 12-5). Some of the conclusions lead to nursing diagnoses, whereas others do not. Diagnostic conclusions include problems treated primarily by nurses (nursing diagnoses) and problems necessitating treatment by several disciplines (collaborative problems). For both nursing diagnoses and collaborative problems, the nurse makes independent decisions (Carpenito-Moyet, 2008).

When physicians refer to commonly accepted medical diagnoses, such as myocardial infarction, diabetes mellitus, or osteoarthritis, they all know the meaning of the diagnoses and the standard approaches to treatment. A **medical diagnosis** is the identification of a disease condition on the basis of a

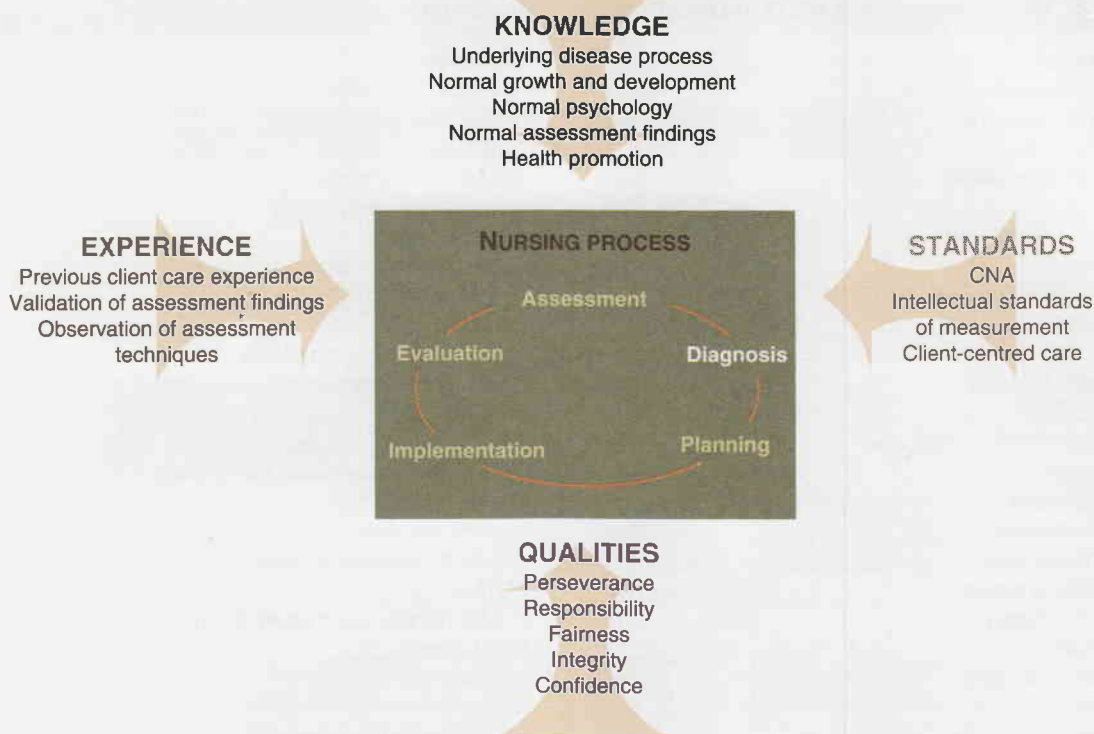


Figure 12-5 Critical thinking and the nursing diagnostic process.

specific evaluation of physical signs, symptoms, the client's medical history, and the results of diagnostic tests and procedures. Physicians are licensed to treat diseases or pathological processes described in medical diagnostic statements. Nurses have a similar diagnostic language. **Nursing diagnosis**, the second step of the nursing process, determines health problems within the domain of nursing. The process of diagnosing is the result of your analysis of data and your resultant identification of specific client responses to health care problems. The term *diagnose* means "distinguish" or "know." A nursing diagnosis is a clinical judgement about individual, family, or community responses to actual and potential health problems or life processes that is within the domain of nursing (NANDA International, 2009). Box 12-4 shows examples of NANDA International Nursing Diagnoses.

A **collaborative problem** is an actual or potential physiological complication that nurses monitor to detect the onset of changes in a client's status (Carpenito-Moyet, 2008). When collaborative problems develop, nurses intervene in collaboration with personnel from other health care disciplines. Nurses manage collaborative problems such as hemorrhage, infection, and cardiac dysrhythmia by using both physician-prescribed and nursing-prescribed interventions to minimize complications. For example, a client who has a surgical wound is at risk for developing an infection, and so a physician prescribes antibiotics. The nurse monitors the client for fever and other signs of infection and implements appropriate wound care measures.

clusters and patterns of data she collected to correctly identify the nursing diagnoses that apply to Ms. Devine's situation. One cluster of data includes information about Ms. Devine's inexperience with surgery and her statement that she has not received information about postoperative activities. Lisa decides that the data include defining characteristics for the nursing diagnosis deficient knowledge regarding postoperative routines related to inexperience. Lisa has been assigned to care for the client on the day after surgery. Lisa knows from experience that common postoperative collaborative problems include wound infection and acute urinary retention. Lisa will work closely with the physician and other members of the nursing team in an effort to prevent or minimize these problems. Ms. Devine's health care plan will include a combination of interventions directed to resolve or manage nursing and medical diagnoses and any related collaborative problems.

Nursing diagnoses provide the basis for selection of nursing interventions to achieve outcomes for which you, as a nurse, are accountable (NANDA International, 2009). A nursing diagnosis focuses on a client's actual or potential response to a health problem rather than on the physiological event, complication, or disease. In the case of the diagnosis *deficient knowledge regarding postoperative routines*, Lisa will offer instruction to improve Ms. Devine's knowledge of what to expect after surgery and how she is able to participate in her postoperative care. A nurse cannot independently treat a medical diagnosis such as a herniated disc. However, Lisa will manage Ms. Devine's postoperative care, monitoring her postoperative progress and managing wound care, fluid administration, and medication therapy to prevent collaborative problems from developing. Collaborative problems occur or probably will occur in association with a specific disease, trauma, or treatment (Carpenito-Moyet, 2008). You will need expert nursing knowledge to assess a client's specific risk for these problems,

Ms. Devine is scheduled to undergo a lumbar laminectomy for a herniated lumbar disc (her medical diagnosis). Lisa has conducted an assessment of Ms. Devine's health status and needs and has collected information in four different problem areas. Lisa then reviews the

► BOX 12-4 Examples of NANDA International Nursing Diagnoses

Activity intolerance	Constipation
Risk for activity intolerance	Perceived constipation
Ineffective airway clearance	Risk for constipation
Latex allergy response	Contamination
Risk for latex allergy response	Risk for contamination
Anxiety	Compromised family coping
Death anxiety	Defensive coping
Risk for aspiration	Disabled family coping
Risk for impaired parent-child attachment	Ineffective coping
Autonomic dysreflexia	Ineffective community coping
Risk for autonomic dysreflexia	Readiness for enhanced coping
Risk-prone health behaviour	Readiness for enhanced community coping
Disturbed body image	Readiness for enhanced family coping
Risk for imbalanced body temperature	Risk for sudden infant death syndrome
Bowel incontinence	Readiness for enhanced decision making
Effective breastfeeding	Ineffective denial
Ineffective breastfeeding	Impaired dentition
Interrupted breastfeeding	Risk for delayed development
Ineffective breathing pattern	Diarrhea
Decreased cardiac output	Risk for compromised human dignity
Caregiver role strain	Moral distress
Risk for caregiver role strain	Risk for disuse syndrome
Readiness for enhanced comfort	Deficient diversional activity
Impaired verbal communication	Disturbed energy field
Readiness for enhanced communication	Impaired environmental interpretation syndrome
Decisional conflict	Adult failure to thrive
Parental role conflict	Risk for falls
Acute confusion	Dysfunctional family processes: alcoholism
Chronic confusion	Interrupted family processes
Risk for acute confusion	

From NANDA International. (2009). *NANDA-I nursing diagnoses: Definitions and classification, 2009–2011*. Indianapolis, IN: Wiley-Blackwell. Reprinted with permission.

to identify the problems early, and then to take preventive action (Figure 12-6). Critical thinking is necessary in identifying nursing diagnoses and collaborative problems so that you individualize care appropriately for your clients.

Nursing diagnosis is recognized in Canada as an innovative means of translating nursing observations and assessments into standard conclusions in a common nomenclature. Although nursing diagnosis is part of basic nursing preparation in Canada, it has not yet been incorporated into provincial and territorial nursing practice standards or legislation. The Canadian Nurses Association (CNA) (2012) describes the competencies required of registered nurses in the area of assessment and diagnosis in the following statements taken from the list of competencies required of nurses for professional practice:

- The registered nurse:
- HW-7 Collaborates with other health care team members to implement strategies that prevent violence, abuse, and neglect (e.g., using screening tools, providing information)
- HW-15 Takes action to address actual or potential risk factors related to health (e.g., food access, unsafe sexual practices, inactivity, smoking)
- HW-16 Takes action to address actual or potential environmental risk factors (e.g., incidents and accidents, environmental contaminants, mechanical equipment, infectious diseases)

- HW-19 Incorporates determinants of health into the plan of care (e.g., adequate income, food and water safety, adequate housing, and shelter)
- HW-27 Uses data collection techniques that are appropriate to the client and the situation (e.g., community assessment, assessment tools)
- CH-1 Collaborates with clients in a holistic assessment (e.g., physical, emotional, mental, spiritual, cognitive, developmental, environmental, meaning of health) (Jurisdictional Collaborative Process, 2006)
- CH-3 Collects assessment data from a range of appropriate sources (e.g., the client, previous and current health records, nursing care plans, collaborative plans of care, family members, significant others, substitute decision makers, census data, epidemiological data, evidence-informed data, referrals, other health care providers)
- CH-4 Uses appropriate assessment techniques for data collection (e.g., observation, inspection, auscultation, palpation, percussion, selected screening tests, pain scales, interview, consultation, focus group, measuring and monitoring)
- CH-5 Validates data collected with the client and appropriate sources (e.g., medication reconciliation, health history, consultations, referrals)
- CH-6 Analyzes data to establish relationships and draw conclusions from the various data collected (e.g., determines

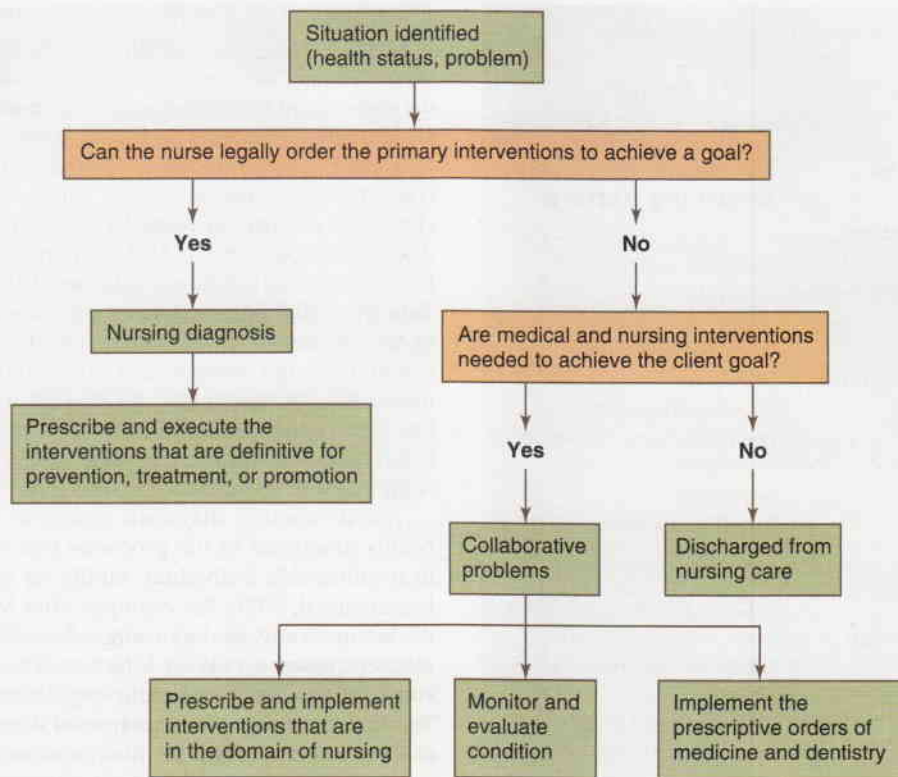


Figure 12-6 Differentiating nursing diagnoses from collaborative problems. **Source:** Copyright © 1990, 1988, 1985, by Lynda Juall Carpenito. Redrawn from Carpenito, L. J. (1995). *Nursing diagnosis: Application to clinical practice* (6th ed.). Philadelphia, PA: J. B. Lippincott.

relationship between health assessment and laboratory values)

- CH-8 Applies knowledge from health sciences (e.g., physiology, pathophysiology, psychopathology, pharmacology, microbiology, epidemiology, genetics, immunology, nutrition, sociology) (Jurisdictional Collaborative Process, 2006)
- CH-9 Identifies actual and potential changes in health (e.g., pain management, disability, immobility)
- CH-18 Facilitates physical, psychological, and psychosocial adjustment (e.g., therapeutic communication, counselling, appropriate referral, chronic disease management) (CNA, 2012)

It is clear from these statements regarding nursing competencies that nursing diagnosis is intrinsic to professional practice in Canada. The use of standard formal nursing diagnostic statements (see Box 12-4) serves several purposes:

1. They provide a precise definition that gives all members of the health care team a common language for understanding the client's needs.
2. They allow nurses to communicate their actions among themselves, to other health care providers, and to the public.
3. They distinguish the nurse's role from that of the physician or other health care providers.
4. They help nurses focus on the scope of nursing practice.
5. They foster the development of nursing knowledge.

Critical Thinking and the Nursing Diagnostic Process

Diagnostic reasoning is a process of using assessment data about a client to logically explain a clinical judgement: in this

case, a nursing diagnosis. The diagnostic process flows from the assessment process and includes decision-making steps. These steps include data clustering, identifying client needs, and formulating the diagnosis or problem.

Clusters and patterns of data often contain **defining characteristics**; the clinical criteria or assessment findings that help confirm an actual nursing diagnosis. **Clinical criteria** are objective or subjective signs and symptoms, clusters of signs and symptoms, or risk factors that lead to a diagnostic conclusion. A specific set of defining characteristics helps confirm identification of each **NANDA International**-approved nursing diagnosis (NANDA International, 2009). As a nurse, you learn to recognize patterns of defining characteristics and then readily select the corresponding diagnosis.

Table 12-1 shows two examples of approved nursing diagnoses and their associated defining characteristics. As you analyze clusters of data, begin to consider various diagnoses that might apply to your client. For example, the diagnoses of *impaired gas exchange* and *ineffective breathing pattern* have similar defining characteristics, including dyspnea, abnormal respiratory rate, and abnormal depth of breathing. When you determine a diagnosis, however, remember that the absence of certain defining characteristics suggests that you reject a diagnosis under consideration. Thus, in the same example, if a client uses accessory muscles to breathe and demonstrates pursed-lip breathing, the correct diagnosis is not *impaired gas exchange* but *ineffective breathing pattern*. Always examine the defining characteristics in your database carefully to confirm or eliminate a nursing diagnosis. To be more accurate, review all characteristics, eliminate irrelevant ones, and confirm the relevant ones.

▶ TABLE 12-1

Examples of NANDA International-Approved Nursing Diagnoses with Defining Characteristics

Diagnosis: Impaired Gas Exchange

Defining Characteristics

Dyspnea
Abnormal rate, rhythm, depth of breathing
Abnormal arterial pH
Abnormal skin colour (pale, dusky)
Hypoxemia
Hypercarbia

Hypoxia
Confusion

Diagnosis: Ineffective Breathing Pattern

Dyspnea
Bradypnea

Decreased vital capacity
Orthopnea
Altered chest excursion
Use of accessory muscles to breathe
Tachypnea
Pursed-lip breathing

Related Factors

Ventilation-perfusion
Alveolar-capillary membrane changes

Hyperventilation
Pain
Chest wall deformity
Anxiety
Musculoskeletal impairment
Body position

Data from NANDA International. (2009). *NANDA-I nursing diagnoses: Definitions and classification, 2009–2011*. Indianapolis, IN: Wiley-Blackwell.

While focusing on patterns of defining characteristics, you also compare a client's pattern of data with data that are consistent with normal, healthy patterns. Use accepted norms as the basis for comparison and judgement. These norms include laboratory and diagnostic test values, professional standards, and normal anatomical or physiological limits. When comparing patterns, judge whether the grouped signs and symptoms are normal for the client and whether they are within the range of healthy responses. Isolate any defining characteristics not within healthy norms in order to identify a problem.

Before finalizing a nursing diagnosis, review the client's general health care needs or problems. Identifying client needs allows you to individualize nursing diagnoses by considering all assessment data and focusing on the more relevant data. For example, after reviewing clusters of data from Ms. Devine's assessment, Lisa was able to recognize that the client had a knowledge deficiency. However, before Lisa was able to provide appropriate care, it was necessary to define Ms. Devine's problem more specifically. NANDA International (2009) has two nursing diagnoses that apply to knowledge: *deficient knowledge* and *readiness for enhanced knowledge*. A careful review of Ms. Devine's presenting behaviours and self-report of the problem led to the selection of *deficient knowledge* because the client had no previous knowledge of postoperative activities. Her problem was not a need for knowledge reinforcement but the absence of knowledge. It is crucial to select the correct diagnostic label for a client's need. Usually from assessment to diagnosis, the information that you gather progresses from general to specific. It helps to think of the problem identification phase in terms of the general health care problem and to think of the formulation of the nursing diagnosis in terms of the specific health problem.

Formulation of the Nursing Diagnosis

NANDA International (2009) identified four types of nursing diagnoses: actual diagnoses, risk diagnoses, health promotion diagnoses, and wellness diagnoses. An **actual nursing diagnosis** describes responses to health conditions or life processes that exist in an individual, family, or community. Defining characteristics (manifestations, signs, and symptoms) that cluster in patterns of related cues or inferences support this diagnostic judgement (NANDA International, 2009). The selection of an actual diagnosis indicates that sufficient assessment data are available to establish the nursing diagnosis. In the case of Ms. Devine, Lisa assessed the client to have back pain with a severity rated from 8 to 9 on a 10-point scale. The pain increased with movement. As a result of the pain, Ms. Devine has slept poorly. *Acute pain* is an actual nursing diagnosis. Prioritizing established nursing diagnosis is an important component of the nursing process (see Chapter 13).

A **risk nursing diagnosis** describes human responses to health conditions or life processes that will possibly develop in a vulnerable individual, family, or community (NANDA International, 2009). For example, after Ms. Devine undergoes the laminectomy, she has a surgical incision. The hospital environment poses a risk for infection. Thus, after Ms. Devine's surgery, Lisa chooses the nursing diagnosis *risk for infection*. The key assessment for this type of diagnosis is the presence of data that reveal risk factors (incision and hospital environment) that confirm Ms. Devine's vulnerability. Such data include physiological, psychosocial, familial, lifestyle, and environmental factors that increase the client's vulnerability to, or likelihood of developing, the condition.

A **health-promotion nursing diagnosis** is a clinical judgement of a person's, family's, or community's motivation and desire to increase well-being and actualize human health potential, as expressed in their readiness to enhance specific health behaviours, such as nutrition and exercise. Health-promotion diagnoses can be used in any health state; they do not reflect current levels of wellness (NANDA International, 2009).

A **wellness nursing diagnosis** describes levels of wellness in an individual, family, or community that can be enhanced (NANDA International, 2009). It is a clinical judgement about an individual, group, or community in transition from a specific level of wellness to a higher level of wellness. You select this type of diagnosis when the client wishes to or has achieved an optimal level of health. For example, readiness for enhanced coping related to successful cancer treatment is a wellness diagnosis, and the nurse and the family unit work together to adapt to the stressors associated with cancer survivorship. In doing so, the nurse incorporates the client's strengths and resources into a plan of care, with the outcome directed at improving the level of coping.

Components of a Nursing Diagnosis

The nursing diagnosis results from the assessment and diagnostic process. Throughout this text, nursing diagnoses are in a two-part format: the diagnostic label followed by a statement of a related factor (Table 12-2). It is this two-part format that provides a diagnosis meaning and relevance for a particular client. In addition, all NANDA International-approved diagnoses have a definition. Risk factors are a component of all risk nursing diagnoses.

Diagnostic Label. The **diagnostic label** is the name of the nursing diagnosis as approved by NANDA International

▶ TABLE 12-2

NANDA International (2009)
Nursing Diagnosis Format

Diagnostic Statement	Diagnostic Statement
Acute pain	Biological, chemical, physical, or psychological injury agents (e.g., inflammation, edema, burn)
Anxiety	Stress Unmet needs Interpersonal transmission
Impaired skin integrity	Situational or maturational crises Fluid retention Impaired skin integrity Excessive secretions Immobilizations Altered circulation

(2009) (see Table 12-1). It describes the essence of a client's response to health conditions in as few words as possible. Diagnostic labels include descriptors used to give additional meaning to the diagnosis. For example, the diagnosis *impaired physical mobility* includes the descriptor *impaired* to describe the nature or change in mobility that best describes the client's response. Examples of other descriptors are *compromised*, *decreased*, *deficient*, *delayed*, *effective*, *imbalanced*, *impaired*, and *increased*.

Related Factors. The **related factor** is a condition or **etiology** identified from the client's assessment data. It is associated with the client's actual or potential response to the health problem and can be changed through the use of nursing interventions. For example, in the case of Ms. Devine, Lisa assessed that Ms. Devine had not received instruction on postoperative activities and that Ms. Devine was asking questions. Lisa also learned that Ms. Devine had not undergone surgery before. The nursing diagnostic statement for Ms. Devine will include the diagnostic label (e.g., *deficient knowledge regarding postoperative routines*) and the related factor (e.g., *related to lack of exposure to instruction*) (Figure 12-7). Because of the related factor *lack of exposure to instruction*, Lisa will implement client instruction on postoperative activities. The "related to" phrase is not a cause-and-effect statement; rather, it indicates that the etiology contributes to or is associated with the client's diagnosis (Figure 12-8). The inclusion of the "related to" phrase requires you to use critical thinking skills to individualize the nursing diagnosis and then select nursing interventions (Table 12-3). The origin or cause of the nursing diagnosis is always within the domain of nursing practice and a condition that responds to nursing interventions.

Sometimes health care providers record medical diagnoses as the etiology in the nursing diagnosis. This is incorrect. Nursing interventions do not change a medical diagnosis. However, you direct nursing interventions at behaviours or conditions that you are able to treat or manage. For example, the nursing diagnosis *acute pain related to herniated disc* is incorrect; nursing actions do not affect the medical diagnosis of a herniated disc. Instead, a diagnosis of *acute pain related to pressure on spinal nerves* results in nursing interventions directed at reducing stress on the vertebrae, improving body alignment, and offering nonpharmacological comfort measures.

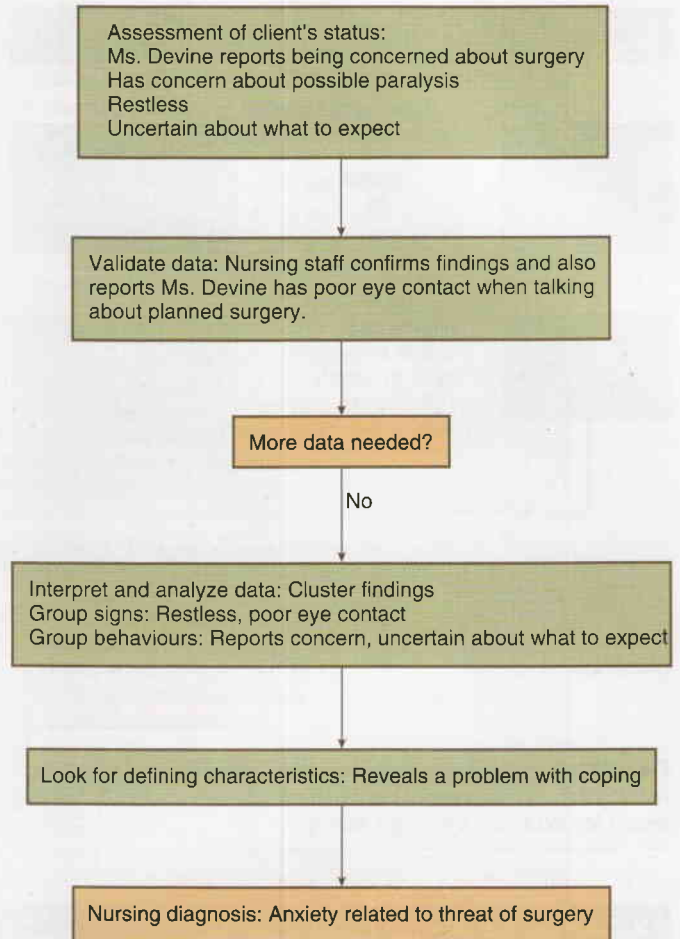


Figure 12-7 Diagnostic process for Ms. Devine.

Table 12-4 demonstrates the association between a nurse's assessment of a client, the clustering of defining characteristics, and formulation of nursing diagnoses. The diagnostic process results in the formation of a total diagnostic label that enables a nurse to develop an appropriate **client-centred plan of care**. The defining characteristics and relevant etiologies are from NANDA International (2009).

Definition. NANDA International (2009) approved a definition for each diagnosis that follows clinical use and testing. The definition describes the characteristics of the human response identified. For example, the definition of the diagnostic label *impaired physical mobility* is the "limitation in independent, purposeful physical movement of the body or of one or more extremities" (NANDA International, 2009). You will refer to definitions of nursing diagnoses to assist in identifying a client's correct diagnosis.

Risk Factors. Risk factors are environmental, physiological, psychological, genetic, or chemical elements that increase the vulnerability of an individual, family, or community to an unhealthful event (NANDA International, 2009). They are a component of all risk nursing diagnoses. The risk factors are cues to indicate that a risk nursing diagnosis is applicable to a client's condition. Examples of risk factors for the nursing diagnosis *risk for infection* include invasive procedures, trauma, malnutrition, immunosuppression, and insufficient knowledge to avoid exposure to pathogens. The risk factors help you

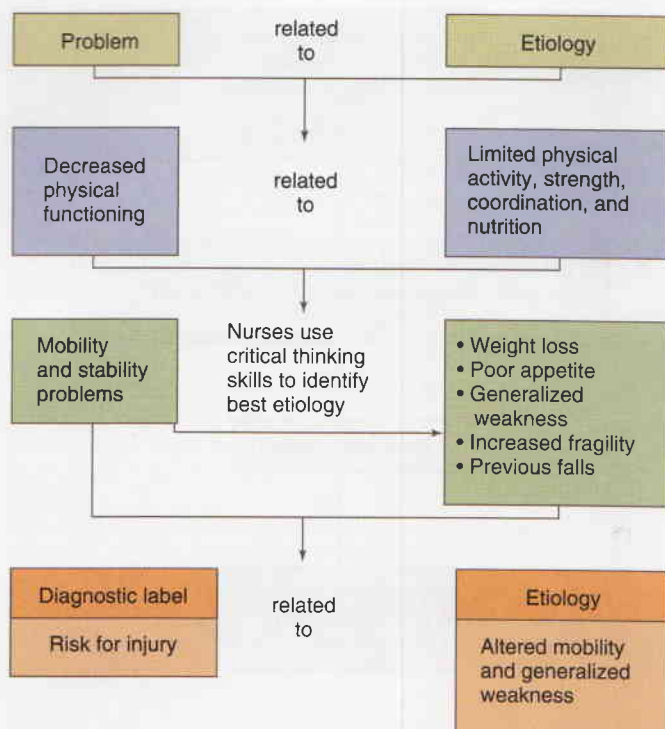


Figure 12-8 Relationship between a diagnostic label and an etiology (related factor). **Source:** Redrawn from Hickey, P. (1990). *Nursing process handbook*. St. Louis, MO: Mosby.

► **TABLE 12-3**

Comparison of Interventions for Nursing Diagnoses with Different Etiologies

Nursing Diagnoses	Interventions
Client A	
Anxiety related to uncertainty over surgery	Provide detailed instructions about the surgical procedure, recovery process, and postoperative care activities
	Plan formal time for client to ask questions
Impaired physical mobility related to acute pain	Administer analgesics 30 minutes before planned exercise
	Instruct client in technique to splint painful site during activity
Client B	
Anxiety related to loss of job	Consult with social work to arrange for job consulting
	Encourage client to continue health promotion activities (e.g., exercise, routine social activities)
Impaired physical mobility related to musculoskeletal injury	Have client perform active range-of-motion exercises to affected extremity every 2 hours
	Instruct client on use of three-point crutch gait

► **TABLE 12-4** Defining Characteristics and Etiologies to Confirm Nursing Diagnoses

Assessment Activities	Defining Characteristics (Clustering Cues)	Nursing Diagnoses	Etiologies ("Related to")
Ask client to rate severity of pain on a scale from 0 to 10	Client verbally reports pain at a level of 8 or 9 when it becomes sharp	Acute pain	Physical pressure on spinal nerves
Observe client's positioning in bed	Client bends knees while on back to lessen pain		
Ask whether client has difficulty falling asleep or awakens during night from pain	Client reports feeling tired, awakens easily	Acute pain	Physical pressure on spinal nerves
Observe for any nonverbal signs of discomfort	Client moans and sighs when attempting to find comfortable position in bed		
Observe client's eye contact when client is talking	Client has poor eye contact when discussing surgery	Anxiety	Threat to health status as a result of surgery
Observe client's body language	Client is restless		
Ask client to describe feelings about surgery	Client is uncertain about what to expect after surgery and the outcome of surgery		
Give instruction in topic of interest, and return in 15 minutes to measure retention	Client forgets details of explanation	Anxiety	Threat to health status as a result of surgery

select the correct risk diagnosis, similar to the manner in which defining characteristics help you formulate actual nursing diagnoses. In addition, risk factors are valuable when you plan preventive nursing interventions.

Support of the Diagnostic Statement. Nursing assessment data must support the diagnostic label, and the related factors must be included in these data. To collect complete, relevant, and correct assessment data, it helps to identify assessment activities that produce specific kinds of data. For example, asking the client about the quality and perception of pain elicits subjective data. However, if palpating an area elicits a facial grimace, that grimace is objective information.

Likewise, asking a client to describe the perception of an irregular heartbeat elicits subjective information, and using auscultation to obtain a pulse elicits an objective measurement of heart rate and rhythm. When you review assessment data to look for clusters of defining characteristics, consider whether you have probed and assessed the client accurately and thoroughly to gather a complete database.

Concept Mapping for Nursing Diagnoses

When caring for a client or groups of clients, you need to think critically about client needs and how to prevent problems from

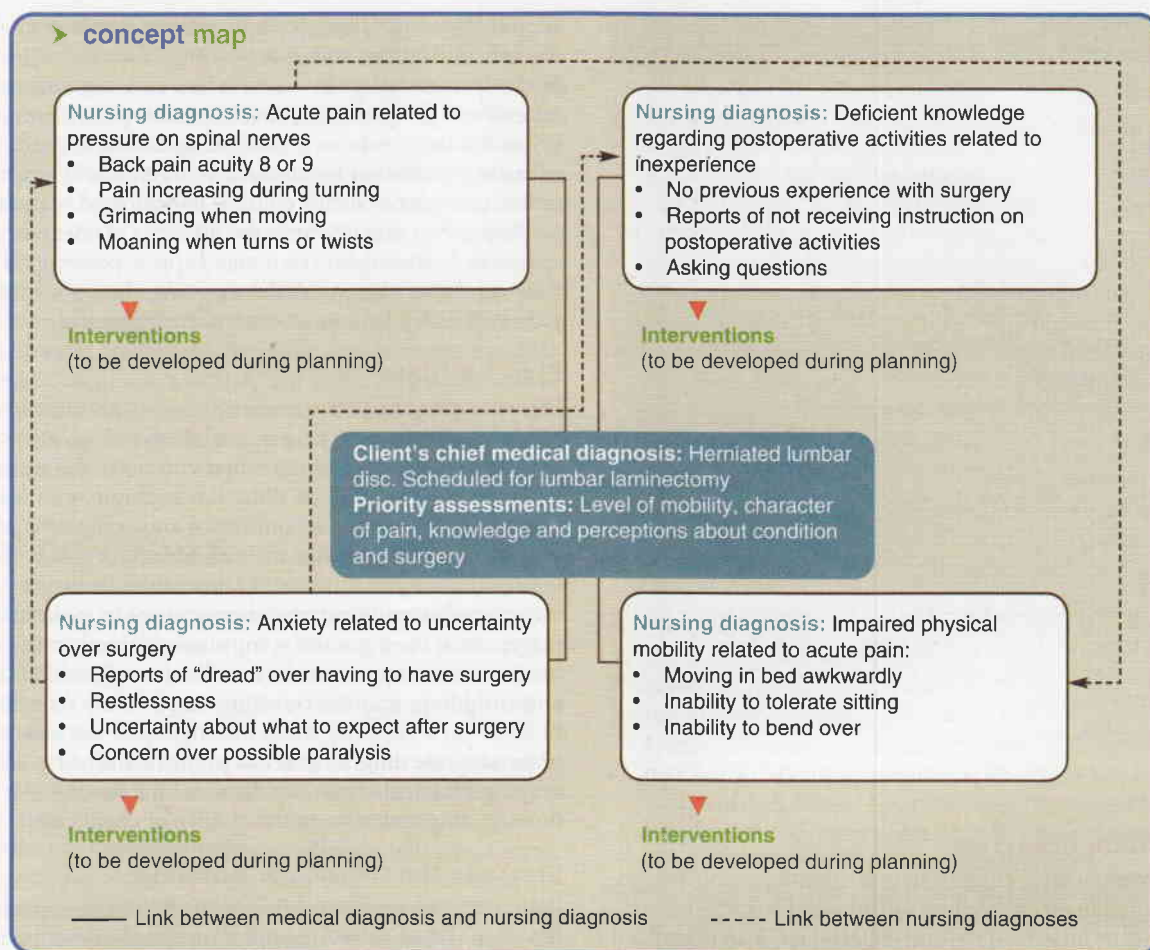


Figure 12-9 Concept map for Ms. Devine's nursing diagnoses.

developing. Concept mapping organizes and shows the interrelationship of client concerns to help you see the whole picture and not just limited parts (Pilcher, 2009). Concept mapping is one way to graphically represent the connections between concepts and ideas that are related to a central subject (e.g., the client's health problems).

Hsu and Hsieh (2005) describe a concept map as a scheme that displays visual knowledge in the form of a hierarchical graphic network. As you proceed in applying each step of the nursing process, your concept map expands with more detail about planned interventions.

Figure 12-9 shows the development of Lisa's concept map for Ms. Devine. Lisa began during the assessment step of the nursing process to gather a database for Ms. Devine. Her assessment included Ms. Devine's perspective of her health problems, as well as the objective and subjective data Lisa collected through observation and examination. Lisa validated findings and added to the database as she learned new information. Data sources include physical, psychological, and sociocultural domains.

Lisa applies clinical reasoning and intuition that reflects her own basic nursing knowledge, her past experiences with clients, patterns that she observed in similar situations, and reference to institutional standards and procedures (e.g., pain management policies or postoperative teaching protocols) (Ferrario, 2004). As Lisa begins to observe patterns of defining

characteristics, she places labels to identify the four nursing diagnoses that apply to Ms. Devine. She is also able to see the relationship between the diagnoses and connects them on the care map graphic. If Ms. Devine continues to be anxious, Lisa knows from her experience in caring for clients with pain that Ms. Devine's pain will increase. Likewise, increased pain will heighten anxiety. Anxiety also influences how well Ms. Devine will attend to any instructions, but until she understands what to expect, her anxiety will not diminish. Ms. Devine's pain, if unrelieved, will likely worsen her immobility.

The advantage of a concept map is its central focus on the client. It allows visualization of the "big picture" of the client's situation assisting the student to develop nursing care strategies that are individualized to the client and the client situation (Taylor & Wros, 2007). It promotes client participation with the eventual plan of care. Lisa's next step will be to collaborate with Ms. Devine to identify interventions appropriate for Ms. Devine's care and then add these to the concept map.

Sources of Diagnostic Errors

Errors occur in the nursing diagnostic process during data collection, interpretation and analysis, clustering, and in statement of the diagnosis. As a nurse, you need to apply methodical critical thinking so that the nursing diagnostic process is accurate.

► BOX 12-5 Sources of Diagnostic Error**Collecting**

Lack of knowledge or skill
Inaccurate data
Missing data
Disorganization

Interpreting

Inaccurate interpretation of cues
Failure to consider conflicting cues
Using an insufficient number of cues
Using unreliable or invalid cues
Failure to consider cultural influences or developmental stage

Clustering

Insufficient clustering of cues
Premature or early closure of clustering
Incorrect clustering

Labelling

Wrong diagnostic label selected
Existence of evidence that another diagnosis is more likely
Condition incorrectly overlooked as a collaborative problem
Failure to validate nursing diagnosis with client
Failure to seek guidance

Errors in Data Collection

To avoid errors in data collection, you should be knowledgeable and skilled in all assessment techniques (Box 12-5). Check for inaccurate or missing data, and collect data in an organized way. The following practice tips are essential to avoid data collection errors:

- Review your level of comfort and competence with interview and physical assessment skills before you begin data collection.
- Approach assessment in steps. Focus on completing a client interview before starting a physical examination. Perhaps focus on only one body system to learn how to gather a complete assessment. Then move to a more complex head-to-toe examination.
- Review your clinical assessments in clinical or classroom settings. They will provide you with a constructive learning opportunity to determine how to revise an assessment or to gather additional information.
- Determine the accuracy of your data. For example, when you auscultate abnormal lung sounds for the first time, be sure of what you hear through the stethoscope. To minimize the risk of inaccuracy, have a more experienced co-worker validate your findings or explain why they are incorrect. Validate your assessment data by double-checking and verifying.
- Be organized in any examination. Have the appropriate forms and examination equipment ready to use. Be sure the environment is private, quiet, and comfortable for the client.

Errors in Interpretation and Analysis of Data

After data collection, review your database to decide whether it is accurate and complete. Review data to confirm that measurable, objective physical findings support subjective data. For example, when a client reports “difficulty breathing,” you

should listen to lung sounds, assess respiratory rate and oxygen saturation, and measure the client’s chest excursion. Begin interpretation by identifying and organizing relevant assessment patterns to confirm the presence of client problems. Be careful to consider any conflicting cues or to decide whether cues are insufficient for forming a diagnosis. It is very important to consider a client’s cultural background or developmental stage when you interpret the meaning of cues. For example, clients from the Middle East may express pain very differently than do Asian clients. Misinterpreting clients’ expressions of pain will easily lead to an inaccurate diagnosis.

Errors in Data Clustering

Errors in data clustering occur when data are clustered prematurely or incorrectly or are not clustered at all. Premature closure of clustering occurs when you make the nursing diagnosis before grouping all data. For example, you learn that a client has had urinary incontinence and complains of urgency and nocturia. You cluster the available data and consider that *impaired urinary elimination* is a probable diagnosis. However, incorrect clustering occurs when you try to make the nursing diagnosis fit the signs and symptoms obtained. In this example, further assessment reveals the client has bladder distension and dribbling, and the condition is probably overflow incontinence. As a result of these findings, you are able to make a more accurate diagnosis: *urinary retention*. Always identify the nursing diagnosis from the data, not the reverse. An incorrect nursing diagnosis affects the quality of client care.

Errors in the Diagnostic Statement

Inaccurately interpreting the nursing diagnosis may result in developing and delivering inappropriate interventions leading to undesirable outcomes (Lunney, 2009). To reduce errors, word the diagnostic statement in appropriate, concise, and precise language. Use correct terminology reflecting the client’s response to the illness or condition. Use of standardized nursing language from NANDA International (2009) helps ensure accuracy. A diagnostic statement such as “unhappy and worried about health” is not a scientifically based diagnosis, and it will lead to errors. The language needs to be more precise and appropriate, such as *ineffective coping related to fear of medical diagnosis*. The problem and etiological portions of the diagnostic statement need to be within the scope of nursing in order to be diagnosed and treated.

Documentation

Once you identify a client’s nursing diagnoses, list them on the written plan of care. In the clinical facility, list nursing diagnoses chronologically as you identify them. When you initiate the original care plan, always list the highest priority nursing diagnoses first.

Thereafter, add additional nursing diagnoses to the list. Date a nursing diagnosis at the time of entry. When you care for a client, review the list and identify the nursing diagnoses with the highest priority, regardless of chronological order.

Nursing Diagnoses: Application to Care Planning

Nursing diagnosis is a mechanism for identifying the nursing care necessary for clients. Diagnoses provide direction for the planning process and the selection of nursing interventions to achieve desired outcomes for clients. Just as the medical

diagnosis of diabetes guides a physician to prescribe a low-carbohydrate diet and medication for blood glucose control, the nursing diagnosis of *impaired skin integrity* directs a nurse to apply certain support surfaces to a client's bed and to initiate a turning schedule. In Chapter 13, you learn how unifying the language of NANDA International, along with the Nursing Interventions Classification (NIC) and Nursing Outcomes Classification (NOC), facilitates the process of matching nursing diagnoses with accurate and appropriate interventions and outcomes (Dochterman & Jones, 2003). The care plan is a map for nursing care and demonstrates your accountability for client care. By learning to make accurate nursing diagnoses, your subsequent care plan will assist in communicating to other professionals the client's health care problems and ensure that you select relevant and appropriate nursing interventions.

❖ KEY CONCEPTS

- The nursing process employs critical thinking to identify, diagnose, and treat clients' responses to health and illness.
- Nursing assessment involves the collection and verification of data and the analysis of all data to establish a database about a client's perceived needs, health problems, and responses to those problems.
- By interpreting the meaning of cues, you form an inference, which then enables you to identify meaningful clusters of information.
- To conduct a comprehensive assessment, you use a structured database format or a problem-oriented approach.
- The interview is an organized conversation with a client that begins by establishing a therapeutic relationship with the client and that aids in the investigation and discussion of the client's health care needs.
- Open-ended questions encourage clients to describe their health histories in detail, whereas closed-ended questions present a list of possible choices for the client.
- An interview includes three phases: orientation, working, and termination.
- Once a client provides subjective data, you consider exploring the findings further by collecting objective data.
- During assessment, you critically anticipate and use an appropriate branching set of questions or observations to collect data, and cues of assessment information are clustered to identify emerging patterns and problems.
- Written data statements are descriptive, to the point, and complete and do not include inferences or interpretative statements.
- Family members and friends sometimes offer observations about the client's needs; these observations will affect the way you deliver care.
- During assessment, you encourage clients to describe their histories of illnesses or health care problems.
- To form a nursing judgement, you critically assess a client, validate the data, interpret the information gathered, and look for diagnostic cues that will lead you to identify the client's problems.
- NANDA International has developed a common language that enables all members of the health care team to understand a client's needs.
- The analysis and interpretation of data require you to validate data, recognize patterns or trends, compare data with healthful standards, and then form diagnostic conclusions.

- The absence of defining characteristics suggests that you reject a proposed diagnosis.
- Three types of nursing diagnoses exist: actual, at risk, and wellness diagnoses.
- A nursing diagnosis is written in a two-part format, including a diagnostic label and an etiological or related factor.
- The "related to" factor of the diagnostic statement assists you in individualizing a client's nursing diagnoses and provides direction for your selection of appropriate interventions.
- Risk factors serve as cues to indicate that a risk nursing diagnosis applies to a client's condition.
- Concept mapping is a visual representation of a client's nursing diagnoses and their relationship with one another.
- Nursing diagnostic errors occur through errors in data collection, in interpretation and analysis of data, in clustering of data, or in the diagnostic statement.
- Nursing diagnoses improve communication between nurses and other health providers.

❖ CRITICAL THINKING EXERCISES

1. Mrs. Lewis comes to the well-baby clinic for her infant's one-month examination. She tells her nurse, Ethan, that the baby has not been sleeping well during the night. In addition, Mrs. Lewis has noted a rash on the baby's abdomen. Write three questions that Ethan might ask to assess the two potential problems Mrs. Lewis has presented. What assessment technique might the nurse apply to assess the rash that would not be used to assess the baby's sleep pattern?
2. Mrs. Spezio has a pressure ulcer over the coccyx that is 5 cm in diameter and approximately 1 cm deep. The tissue surrounding the ulcer is inflamed and tender to touch. Mrs. Spezio is transferring from a long-term care facility where she had resided for six months after a massive stroke. She is unable to move independently in bed and does not sense pressure or discomfort over her coccyx or hips. In view of this clinical situation, identify the defining characteristics and related factors for the nursing diagnosis *impaired skin integrity*.

❖ REVIEW QUESTIONS

1. The purpose of assessment is to
 1. Make a diagnostic conclusion
 2. Delegate nursing responsibility
 3. Teach the client about his or her health
 4. Establish a database concerning the client
2. The nurse completes a nursing health history with her client. In order to avoid incorrect inferences and ensure the data are accurate, the nurse's next step is to
 1. Analyze and interpret the data
 2. Document the data
 3. Validate data with the client
 4. Share the data with other health care providers
3. During data clustering, a nurse
 1. Provides documentation of nursing care
 2. Reviews data with other health care providers
 3. Makes inferences about patterns of information
 4. Organizes cues into patterns that enable the nurse to identify nursing diagnoses

4. You gather the following assessment data. Which of the following cues form a pattern? (Choose all that apply.)
 1. The client is restless.
 2. Fluid intake for 8 hours is 800 mL.
 3. The client complains of feeling short of breath.
 4. The client has drainage from surgical wound.
 5. Respirations are 24 per minute and irregular.
 6. Client reports loss of appetite for more than two weeks.
5. A nursing diagnosis is
 1. The diagnosis and treatment of human responses to health and illness
 2. The advancement of the development, testing, and refinement of a common nursing language
 3. A clinical judgement about individual, family, or community responses to actual and potential health problems or life processes
 4. The identification of a disease condition on the basis of a specific evaluation of physical signs, symptoms, the client's medical history, and the results of diagnostic tests
6. Lisa reviews data that she has collected regarding Ms. Devine's pain symptoms. She compares the defining characteristics for *acute pain* with those for *chronic pain*. In the end, she selects *acute pain* as the correct diagnosis. This is an example of how Lisa avoids an error in
 1. Data collection
 2. Data clustering
 3. Data interpretation
 4. Making a diagnostic statement
7. One of the purposes of the use of standard formal nursing diagnostic statements is to
 1. Evaluate nursing care
 2. Gather information on client data
 3. Help nurses to focus on the role of nursing in client care
 4. Facilitate understanding of client problems among health care providers
8. The nursing diagnosis *readiness for enhanced communication* is an example of
 1. A risk nursing diagnosis
 2. An actual nursing diagnosis
 3. A potential nursing diagnosis
 4. A wellness nursing diagnosis
9. The nursing diagnosis *hypothermia* is an example of
 1. A risk nursing diagnosis
 2. An actual nursing diagnosis
 3. A potential nursing diagnosis
 4. A wellness nursing diagnosis
10. The word *impaired* in the diagnosis *impaired physical mobility* is an example of a
 1. Descriptor
 2. Risk factor
 3. Related factor
 4. Nursing diagnosis
11. Nurses use a variety of assessment techniques for data collection. The nurse knows that the first appropriate assessment technique for data collection is
 1. Review client's medical record
 2. Interview client
 3. Consult health care team
 4. Review literature
12. Casey is reviewing a client's list of nursing diagnoses in the medical record. The most recent nursing diagnosis is *diarrhea related to intestinal colitis*. This is an incorrectly stated diagnostic statement, best described as
 1. Identifying the clinical sign instead of an etiology
 2. Identifying a diagnosis on the basis of prejudicial judgement
 3. Identifying the diagnostic study rather than a problem caused by the diagnostic study
 4. Identifying the medical diagnosis instead of the client's response to the diagnosis
13. Which of the following are defining characteristics for the nursing diagnosis *impaired urinary elimination*? (Choose all that apply.)
 1. Nocturia
 2. Frequency
 3. Urine retention
 4. Inadequate urinary output
 5. Treatment with intravenous fluids
 6. Sensation of bladder fullness

✦ RECOMMENDED WEB SITES

Canadian Nurses Association (CNA) Canadian Registered Nurse Exam Competencies: http://www2.cna-aiic.ca/CNA/nursing/rnexam/competencies/default_e.aspx

This Web site provides the document on entry-level competencies for all practising registered nurses.

Center for Nursing Classification & Clinical Effectiveness: www.nursing.uiowa.edu/excellence/nursing_knowledge/clinical_effectiveness/index.htm

The University of Iowa's Center for Nursing Classification & Clinical Effectiveness was established to facilitate ongoing research of the Nursing Interventions Classification (NIC) and Nursing Outcomes Classification (NOC). This site provides an overview of the NIC and NOC and offers information about new classification material and publications.

NANDA International: <http://www.nanda.org/>

Through this Web site, NANDA International (formerly the North American Nursing Diagnosis Association) provides current information on nursing diagnosis research, publications, links, and Internet resources.

Registered Nurses' Association of Ontario (RNAO): Nursing Best Practices Guidelines: <http://www.rnao.org/bestpractices/>
The RNAO has developed an extensive process to develop best practices guidelines in a variety of areas of clinical nursing. They have received federal as well as provincial funding for this process, and their work has been made available to all Canadian nurses through this Web site, which lists all current guidelines that have been developed.

Review Question Answers

12. 1, 2
1. 4; 2. 3; 3. 4; 4. 1, 3; 5. 3; 6. 4; 7. 4; 8. 4; 9. 2; 10. 1; 11. 2;

Rationales for the Review Questions appear at the end of the book.

Planning and Implementing Nursing Care

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Canadian content written by Willena I. Nemeth, RN, MN, S. Helen Fraser, RN, MN, and Debbie A. Brennick, RN, MN

objectives

Mastery of content in this chapter will enable you to:

- Define the key terms listed.
- Explain the relationship between planning and nursing assessment and diagnosis.
- Discuss the criteria used in priority setting.
- Describe goal setting.
- Discuss the difference between a goal and an expected outcome.
- List the seven guidelines for writing an outcome statement.
- Develop a plan of care from a nursing assessment.
- Discuss the differences between nurse-initiated, physician-initiated, and collaborative interventions.
- Discuss the process of selecting nursing interventions.
- Describe the purposes of a written nursing care plan.
- Describe the elements of a concept map.
- Describe the consultation process.
- Explain the relationship of implementation to the nursing diagnostic process.
- Discuss the differences between protocols and medical directives or standing orders.
- Describe the association between critical thinking and selecting nursing interventions.
- Identify preparatory activities to perform before implementation.
- Discuss steps taken to revise a plan of care before performing implementation.
- Define the three implementation skills.
- Describe and compare direct and indirect nursing interventions.
- Select appropriate interventions for an assigned client.

key terms

- Activities of daily living, p. 189
- Adverse reaction, p. 190
- Client-centred goal, p. 176
- Collaborative interventions, p. 178
- Consultation, p. 184
- Counselling, p. 189
- Critical pathways, p. 182
- Dependent nursing interventions, p. 178
- Direct care, p. 185
- Expected outcome, p. 175
- Goal, p. 175
- Independent nursing interventions, p. 178
- Instrumental activities of daily living, p. 189
- Kardex, p. 182
- Lifesaving measure, p. 189
- Long-term goal, p. 176
- Medical directive, p. 186
- Nursing care plan, p. 182
- Nursing intervention, p. 185
- Nursing-sensitive client outcome, p. 177
- Planning, p. 174
- Preventive nursing actions, p. 190
- Priority setting, p. 174
- Scientific rationale, p. 179
- Short-term goal, p. 176
- Standing order, p. 186

Planning Nursing Care

Lisa is beginning to plan the nursing care for Ms. Devine. In the diagnostic step of the nursing process (see Chapter 12), Lisa identified four nursing diagnoses relevant to Ms. Devine's case: acute pain, anxiety, deficient knowledge, and impaired physical mobility. Lisa is responsible for planning Ms. Devine's care from this morning until the time Ms. Devine leaves for surgery. Lisa will have left work on the unit by the time Ms. Devine returns from surgery, but as her primary nurse, Lisa will provide direction for the staff who assume Ms. Devine's care. Careful planning involves seeing a relationship between a client's problems, recognizing that certain problems take precedence over others, and proceeding with a safe and efficient approach to care. For each of the diagnoses, Lisa identifies the goals and expected outcomes that she and the client hope to achieve. The goals and outcomes direct Lisa in selecting appropriate therapeutic interventions suited to Ms. Devine's own needs, strengths, and limitations. Lisa knows she needs to develop a plan quickly, because Ms. Devine is to go to the operating room by noontime.

media resources

evolve WEBSITE

<http://evolve.elsevier.com/Canada/Potter/fundamentals/>

- Audio Chapter Summaries
- Examination Review Questions
- Glossary
- Student Learning Activities
- Weblinks

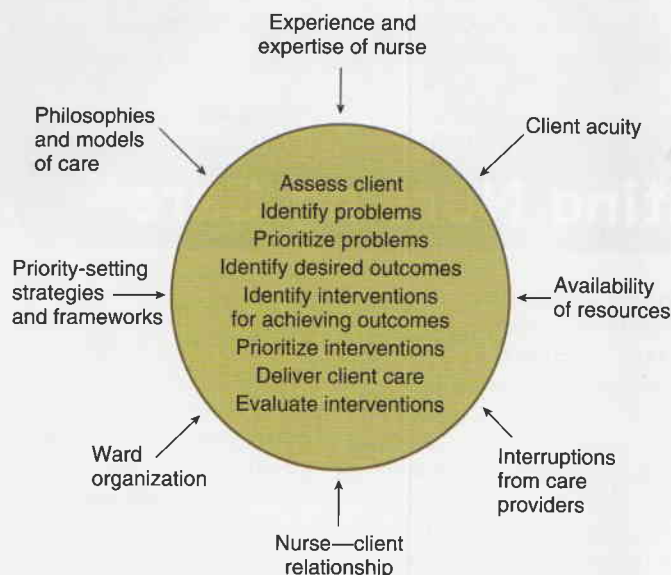


Figure 13-1 A model for priority setting. **Source:** Adapted from Hendry, C., & Walker, A. (2004). Priority setting in clinical nursing practice. *Journal of Advanced Nursing*, 47, 427–436.

After you identify a client's nursing diagnoses and strengths, you begin planning nursing care. **Planning** is a category of nursing behaviour in which a nurse sets client-centred goals, outlines expected outcomes, plans nursing interventions, and selects interventions that will resolve the client's problems and achieve the goals and outcomes. Planning requires critical thinking, applied through deliberate decision making and problem solving to set priorities for a client. Many clients have multiple diagnoses and a number of health problems. Successful planning requires that you collaborate with the client and family, consult with other members of the health care team, and review related literature. This literature includes available evidence related to the client's health problems. A plan of care is dynamic and will change as you meet the client's needs or identify new needs.

Establishing Priorities

Priority setting is the ranking of nursing diagnoses or client problems, through the use of principles such as urgency or importance, to establish a preferential order for nursing actions (Hendry & Walker, 2004; Figure 13-1). By ranking nursing diagnoses in order of importance, you attend to the client's most important needs first. Priorities help you to anticipate and sequence nursing interventions for a client who has multiple nursing diagnoses and health problems. When feasible, you and your clients select mutually agreed-upon priorities on the bases of the urgency of the problems, safety, the nature of the treatment indicated, and the relationship among the diagnoses.

Establishing priorities or determining urgency of the identified health problems is done on the basis of their severity or physiological importance (Lewis et al, 2010). Nursing diagnoses of conditions that, if untreated, result in harm to the client or others have the highest priorities. For example, *risk for other directed violence*, *impaired gas exchange*, and *decreased cardiac output* are typically high-priority nursing diagnoses that raise

issues of safety, adequate oxygenation, and adequate circulation. High priorities are sometimes both physiological and psychological and may address other basic human needs. Consider Ms. Devine's case. Among Ms. Devine's nursing diagnoses, *acute pain* and *anxiety* are of the highest priority. Lisa knows that she needs to relieve Ms. Devine's acute pain and lessen the client's anxiety so that the client will approach surgery in less distress.

Intermediate priority nursing diagnoses involve the none-emergency, non-life-threatening needs of the client. In Ms. Devine's case, *deficient knowledge* is an intermediate diagnosis. It is very important that Lisa properly prepare Ms. Devine for surgery. Focused and individualized instruction will help Ms. Devine understand what to expect during her preoperative preparation and how to participate in postoperative care activities. Attending to the diagnosis of *deficient knowledge* will help minimize postoperative complications. Once Lisa addresses the higher priority nursing diagnoses of pain and anxiety, Ms. Devine will probably be more able to learn postoperative care. Also, greater understanding of the surgical procedure may help relieve Ms. Devine's anxiety.

Low-priority nursing diagnoses are not always directly related to a specific illness or prognosis but affect the client's future well-being. Many low-priority diagnoses focus on the client's long-term health care needs. In Ms. Devine's situation, *impaired physical mobility* is caused in part by her pain but also by her medical condition: a herniated disc. Lisa will monitor this diagnosis carefully, especially postoperatively. For now, Lisa will administer prescribed pain medication to make Ms. Devine as comfortable as possible, which may improve Ms. Devine's ability to turn and position herself. After the surgery, Lisa will reassess her client. If *impaired physical mobility* remains a problem, the diagnosis is a higher priority because it is essential for Ms. Devine to achieve more normal mobility for a full recovery and to prevent postoperative complications.

The order of priorities changes as a client's condition changes, sometimes within a matter of minutes. Ongoing client assessment is essential for determining the priority of your client's nursing diagnoses.

In considering time as a factor in setting priorities, White (2003) explained that the planning of nursing care occurs in three phases: initial, ongoing, and discharge. Initial planning involves development of a preliminary plan of care after admission assessment and initial selection of nursing diagnoses. Because of progressively shorter lengths of hospitalization, initial planning is important in addressing nursing diagnoses and collaborative problems in order to hasten problem resolution. Ongoing planning involves continuous updating of the client's plan of care. As the client's condition changes, you assess new information about the client and evaluate the client's status. Discharge planning involves the anticipation and preparation for meeting the client's needs after discharge. This is a vital phase of planning that should begin upon admission or when care begins. It continues throughout the period of care.

Lisa is now involved with the initial planning of Ms. Devine's care. Lisa needs to initiate interventions to manage each of Ms. Devine's nursing diagnoses before surgery. Once Ms. Devine returns from the operating room, Lisa, or another nurse, will conduct ongoing planning by further assessing Ms. Devine's status and then redefining nursing diagnoses that apply postoperatively. As Ms. Devine recovers from surgery, Lisa and her colleagues will work together in developing

a discharge plan that will assist Ms. Devine in returning home in as healthy a condition as possible.

As a nurse, you need to prioritize the specific interventions or strategies that you will use to help a client achieve desired goals and outcomes. For example, as Lisa considers the high-priority diagnosis of *acute pain* for Ms. Devine, she decides which intervention, among the interventions of administering an analgesic, repositioning, and teaching relaxation exercises, to perform first. Lisa knows that a certain degree of pain relief is necessary before a client can attend to relaxation exercises. She may decide to turn and reposition Ms. Devine and then give her an analgesic. However, if Ms. Devine is too uncomfortable to turn, Lisa will select administering the analgesic as her first priority. It is important to involve the client in priority setting whenever possible; in some situations, you and your client have different priorities.

Critical Thinking in Establishing Goals and Expected Outcomes

Once you identify a nursing diagnosis, you must identify the best approach to address and resolve the problem. What do you plan to achieve? **Goals and expected outcomes** are specific client behaviour or physiological responses that you set to achieve through nursing diagnosis or collaborative problem resolution. They provide a clear focus for the type of interventions necessary to care for your client.

For example, in the case of Ms. Devine, who has a diagnosis of *acute pain related to pressure on spinal nerves*, a goal of care includes “Client achieves improved pain control before surgery.” To monitor Ms. Devine’s progress, Lisa must use expected outcomes or measurable criteria to evaluate goal achievement. Measurable outcomes for the goal of pain relief include “Client’s self-report of pain will be 3 or less on a scale of 0 to 10,” and “Client will be able to turn without additional discomfort.” The outcomes will reflect Lisa’s success in selecting interventions for Ms. Devine’s pain relief. After administering an analgesic and repositioning the client, Lisa will return to Ms. Devine’s room in 30 minutes and ask her to rate her pain and comfort level. If Ms. Devine rates her pain at a 3 or less and similarly reports no additional discomfort when turning, her goals will have been met. Lisa will follow her plan until Ms. Devine goes to the operating room. Goals and expected outcomes serve two purposes: to provide clear direction for the selection and use of nursing interventions and to provide focus for evaluating the effectiveness of the interventions.

Planning nursing care requires critical thinking (Figure 13-2). You need to carefully evaluate the identified nursing diagnoses, the urgency of the problems, and the resources of the client and the health care delivery system. You apply knowledge from the nursing, medical, and sociobehavioural sciences to plan client care. To select goals, expected outcomes, and interventions, you must consider your previous experience with similar client problems, as well as any established standards for nursing practice. Goals and outcomes need to be

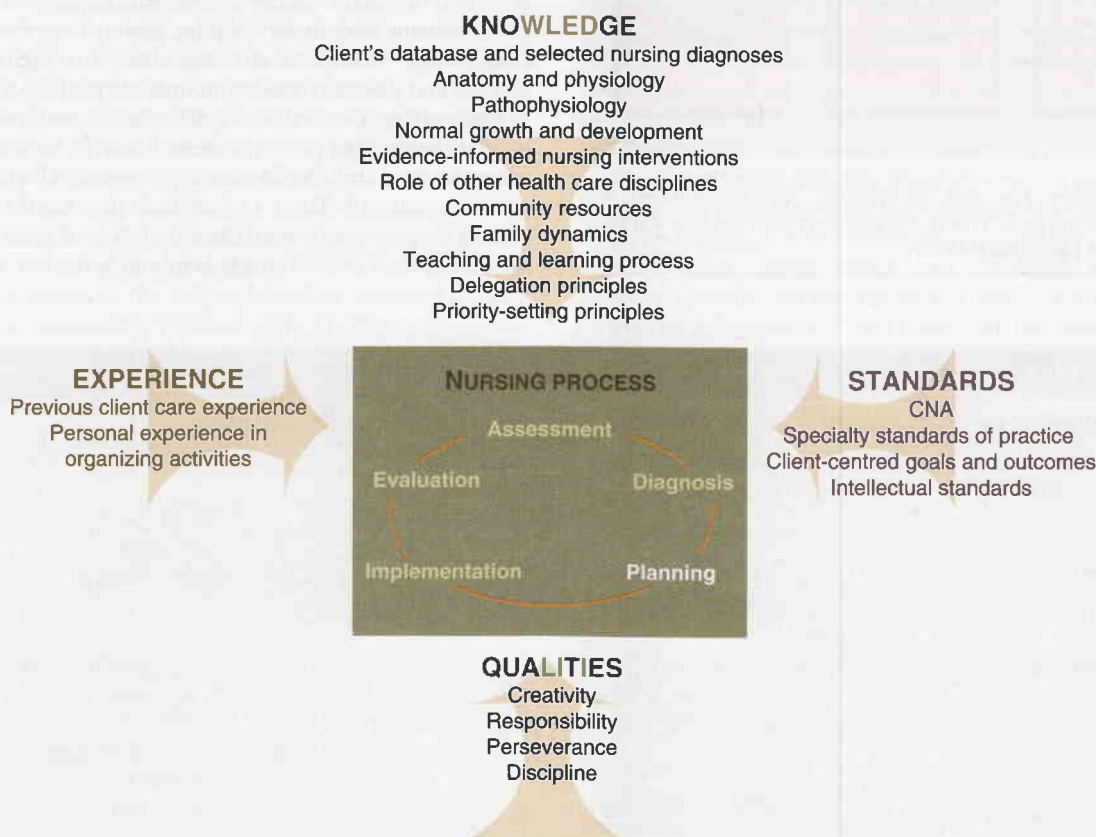


Figure 13-2 Critical thinking and the process of planning care. CNA, Canadian Nurses Association.

relevant to client needs and to be specific, observable, measurable, time-limited, and achievable.

For example, in choosing a plan for managing the client's acute pain, Lisa creatively selects a comfort measure that Ms. Devine practises at home. The diagram in Figure 13-3 graphically illustrates the relationships between nursing diagnoses, goals, expected outcomes, and nursing interventions.

Goals of Care

A **client-centered goal** is a specific and measurable behavioural response that reflects a client's highest possible level of wellness and independence in function. Examples are "Client will perform self-care hygiene independently" and "client will remain free of infection." A goal is realistic and based on client

needs and resources. A client goal represents predicted resolution of a nursing diagnosis or health problem, proof of progress toward resolution, enhanced improved health status, or continued maintenance of optimal health (Carpenito-Moyet, 2008). A goal involves only one behaviour or response. The example of "Client will administer a self-injection and demonstrate infection control measures" is incorrect because the statement includes two different behaviours: "administer" and "demonstrate." Instead, the goal should be worded as follows: "Client will administer a self-injection." The specific criteria you use to measure success of the goal are the expected outcomes: for example, "Client will prepare medication dose correctly" and "Client uses aseptic technique when preparing injection site." Each goal is time-limited so that the health care team has a common time frame for problem resolution. The time frame depends on the nature of the problem, etiology, overall condition of the client, and treatment setting.

A **short-term goal** is an objective behaviour or response that you expect a client to achieve in a short time, usually less than a week. In an acute care setting, you set goals for over a course of just a few hours. Such was the case when Lisa set for Ms. Devine the goal "Client's level of comfort will improve before surgery." A **long-term goal** is an objective behaviour or response that you expect a client to achieve over a longer period, usually over several days, weeks, or months: for example, "Client will be tobacco-free within 60 days." Goal setting establishes the framework for the nursing care plan. Table 13-1 outlines the progression from nursing diagnoses to goals and expected outcomes, which Lisa individualizes to meet Ms. Devine's needs.

Role of the Client in Goal Setting. It is important to work closely with clients in setting goals. Mutual goal setting is an activity that includes clients and families in prioritizing goals of care and in developing plans for action (Bulechek et al., 2008). Clients need to be able to engage in problem solving and decision making in order to participate effectively in goal setting. Goals that are determined with the client, and have a clear action plan, are more likely to be successful. For example, Lisa and Ms. Devine set the goal "Client will report greater comfort." They agreed that this would be demonstrated by pain acuity rated less than 3 on a scale of 0 to 10, a level that Ms. Devine reports is tolerable for her.

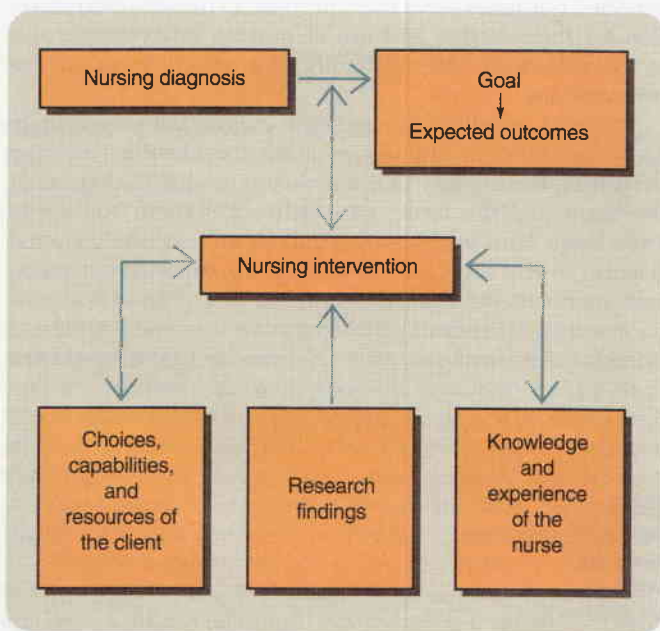


Figure 13-3 From diagnosis to outcome. **Source:** Revised and redrawn from Gordon, M. (1994). *Nursing diagnosis: Process and application* (3rd ed.). St Louis, MO: Mosby.

TABLE 13-1 Examples of Goal Setting with Expected Outcomes for Ms. Devine

Nursing Diagnoses	Goals	Expected Outcomes
Acute pain related to pressure on spinal nerves	Ms. Devine's level of comfort will improve before surgery.	Client will be able to turn without reported discomfort in two hours. Client's self-report of pain will be 3 or less on a scale of 0 to 10 by the time of scheduled surgery.
Anxiety related to uncertainty over surgery	Ms. Devine will accept plan for surgical care before scheduled surgery.	Client will express less uneasiness about surgical experience in next four hours.
Deficient knowledge regarding postoperative activities related to inexperience	Ms. Devine will understand treatment procedures planned postoperatively within four hours.	Client will describe purpose of postoperative exercises prior to scheduled surgery. Client will demonstrate use of incentive spirometer and deep breathing and coughing prior to scheduled surgery. Client will explain purpose of postoperative nursing care prior to scheduled surgery.
Impaired physical mobility related to acute back pain	Ms. Devine will move independently in bed before surgery.	Client will initiate turning without additional discomfort within two hours. Client will position self for care procedures within two hours.

Expected Outcomes

An expected outcome is a specific measurable change in a client's status that you expect in response to nursing care. Expected outcomes provide a focus or direction for nursing care because they are the desired physiological, psychological, social, developmental, or spiritual responses that indicate resolution of clients' health problems. Derived from both short- and long-term goals, outcomes determine when a specific client-centred goal has been met.

Usually you list several expected outcomes for each nursing diagnosis and goal. The reason for the multiple expected outcomes is that sometimes one nursing action is not enough to resolve a specific problem. In addition, the listing of the step-by-step expected outcomes assists in planning interventions. Write expected outcomes sequentially, specifying time frames for each (see Table 13-1). Time frames provide progressive steps to recovery and assist in ranking nursing interventions. In addition, time frames set limits for problem resolution. In the case of Ms. Devine, Lisa plans to reduce her pain to a level less than 3 so she is able to turn comfortably in bed within the next two hours.

Write expected outcome statements in measurable terms. This enables you to note the specific behaviour or physiological response expected for resolution of the problem. For example, "Client will have less pain" is an inaccurate outcome statement because the phrase "less pain" is nonspecific. The statement "Client will report pain acuity of less than 3 on a scale of 0 to 10" is accurate.

Nursing Outcomes Classification. The current health care environment pays considerable attention to measuring outcomes sensitive to nursing interventions. Many health care administrators focus on outcomes in determining staffing and other resources in health care settings. The Iowa Intervention Project published the Nursing Outcomes Classification (NOC) and has linked the outcomes to NANDA International (2009) nursing diagnoses (University of Iowa College of Nursing, 2008). The Iowa researchers defined a **nursing-sensitive client outcome** as an individual, family, or community behaviour or perception that is measurable along a continuum in response to a nursing intervention. For any given NANDA International nursing diagnosis, multiple outcomes are suggested in NOC. These outcomes provide descriptions of the focus of nursing care and include indicators for measuring success with interventions (Table 13-2).

Combining Goals and Outcome Statements

Nurses within health care settings may refer to the terms, goals, and outcomes interchangeably. This is acceptable as long as the criteria for writing goals and outcomes are met. For example, the statement "Client will achieve pain control as evidenced by reporting pain acuity of less than 3 on a scale of 0 to 10 within 24 hours" is an acceptable statement. The goal portion of the statement broadly describes the desired client status ("achieve pain control"), and the outcome portion of the statement contains the observable criterion ("3 on a [pain] scale") needed to measure success.

Guidelines for Writing Goals and Expected Outcomes

There are seven guidelines for writing goals and expected outcomes: client-centred, singular, observable, measurable, time-limited, mutual, and realistic.

► TABLE 13-2

Examples of NANDA International Nursing Diagnoses and Suggested NOC Linkages

Nursing Diagnosis	Suggested NOC-Based Outcomes (Examples)	Outcome Indicators (Examples)
Deficient knowledge	Knowledge: treatment procedures	Description of treatment procedure Description of steps in procedure
	Client satisfaction: teaching	Explanations provided in understandable terms Explanation of activity restrictions
Activity intolerance	Activity tolerance	Oxygen saturation with activity Pulse rate with activity Respiratory rate with activity
	Self-care status	Bathes self Dresses self Prepares food and fluid for eating

Client Goal or Outcome. Outcomes and goals reflect client responses that are expected after nursing interventions. Write a goal to reflect client behaviour, not to reflect your goals or interventions. A correct outcome statement is "Client will ambulate in the hall three times a day." A common error is to write "Ambulate client in the hall three times a day."

Singular Goal or Outcome. Be precise in evaluating a client response to a nursing action. Each goal and outcome addresses only one behaviour or response.

Observable Goal or Outcome. You need to be able to observe whether change in a client's status occurs. Changes in physiological findings and in the client's knowledge, perceptions, and behaviour are observable. You observe outcomes by directly asking clients about their condition and by using assessment skills. For the outcome "Chest sounds will be clear on auscultation by 8/31," you auscultate the client's chest routinely after therapy (e.g., inhalation, percussion). The outcome statement "Client will appear less anxious" is not a correct statement because no specific behaviour for "will appear" is observable.

Measurable Goal or Outcome. You will learn to write goals and expected outcomes that set standards against which to measure the client's response to nursing care. Examples such as "Body temperature will remain between the normal range of 36.5–37.5° C" and "Apical pulse will remain between 60 and 100 beats per minute" enable you to objectively measure changes in the client's status.

Time-Limited Goal or Outcome. The time frame for each goal and expected outcome indicates when you expect the response to occur. Time frames assist in determining progress toward goals and outcomes.

Mutual Goal or Outcomes. Mutually set goals and expected outcomes ensure that client and nurse agree on the direction and time limits of care. Mutual goal setting increases clients' motivation and cooperation.

Realistic Goal or Outcome. Set goals and expected outcomes that are achievable. This provides clients with a sense of empowerment that increases motivation and cooperation. In order to establish realistic goals, you need to assess the resources of the client, the family, the health care facility, and the community. You need to be aware of the client's physiological, emotional, cognitive, and sociocultural influences and take into consideration the client's determinants of health.

Types of Interventions

Nursing interventions belong to three categories: nurse-initiated, physician-initiated, and collaborative. Interventions are based on client needs. Some clients require all three categories of interventions, whereas others need only nurse- and physician-initiated interventions.

Nurse-initiated interventions are **independent nursing interventions**. These do not require direction or orders from other health care providers. As a nurse, you act independently for clients. Nurses' actions are grounded in evidence-informed decision making. Examples include elevating an edematous extremity, instructing clients about side effects of medications, or directing a client how to splint an incision during coughing.

Physician-initiated interventions are **dependent nursing interventions**, or actions that require orders or directions from physicians. The interventions are directed toward treating or managing a medical diagnosis. Nurse practitioners working under collaborative agreements with physicians or who are licensed through provincial or territorial nursing legislation are also able to provide such orders or directions for care. As the nurse, you intervene by carrying out these written orders or verbal orders in the case of emergency situations. Administering a medication and changing a dressing are examples of written physician-initiated interventions.

Each physician-initiated intervention requires specific nursing responsibilities that are based on nursing knowledge. For example, when administering medications, you are responsible for knowing the classification of the drug, its physiological action, the normal dosage, side effects, and nursing interventions related to its action or side effects (see Chapter 33).

Interdependent nursing interventions, or **collaborative interventions**, are therapies that require the combined knowledge, skill, and expertise of a number of health care providers. Typically, when you plan care for a client, you review the necessary interventions and determine whether the collaboration is necessary. An interdisciplinary health care team conference about a client's care is useful in determining interdependent nursing interventions.

In the case study involving Lisa and Ms. Devine, Lisa will initiate independent nursing interventions to help calm Ms. Devine's anxiety and to begin teaching her about postoperative care. Lisa will independently assist Ms. Devine to change position in bed to minimize her discomfort and promote increased mobility. The dependent interventions Lisa plans to implement are administering an analgesic and completing any necessary preoperative diagnostic tests. Lisa decides that consultation with the unit social worker is another way to help Ms. Devine with her anxiety over surgery; this is an example of a collaborative intervention. A nurse is required to have the appropriate and specific knowledge base, skills, and abilities, that are evidence based, to be able to recognize and

► TABLE 13-3

Frequent Errors in Writing Nursing Interventions

Type of Error	Incorrectly Stated Nursing Intervention	Correctly Stated Nursing Intervention
Failure to precisely or completely indicate nursing actions	Turn client every two hours	Turn client every two hours, using the following schedule: 0800: supine 1000: left side 1200: prone 1400: right side (repeat this routine beginning at 1600 and 2400)
Failure to indicate frequency	Perform blood glucose measurements	Measure blood glucose before each meal: 0700, 1100, and 1600
Failure to indicate quantity	Irrigate wound once a shift: 0800, 1600, and 2400	Irrigate wound with 100 mL normal saline until clear: 0800, 1600, and 2400
Failure to indicate method	Change client's dressing once a shift: 0800, 1600, and 2400	Replace client's dressing with Neosporin ointment to wound and two dry 4x4 dressings secured with hypoallergenic tape, once a shift: 0800, 1600, and 2400

question errors to competently care for assigned client populations (Table 13-3). The ability to recognize incorrect orders or therapies is the responsibility of the nurse before implementation of any order or therapy. Errors may occur in writing or transcribing orders. Clarifying an order is competent nursing practice and protects clients from harm. When you carry out an incorrect or inappropriate intervention, you are responsible for an error in judgement and are legally responsible for any complications resulting from the error (see Chapter 8).

Selection of Interventions

Interventions are not selected randomly. Clients with the diagnosis of *anxiety*, for example, may require a variety of interventions. You treat anxiety related to the uncertainty of impending surgery very differently than anxiety related to a possible loss of family role function. When choosing interventions, consider six factors: (1) the nursing diagnosis, (2) goals and expected outcomes, (3) the evidence base (e.g., research or proven practice guidelines), (4) feasibility, (5) acceptability to the client, and (6) your own competence (Bulechek et al., 2008)

► BOX 13-1 Choosing Nursing Interventions

Characteristics of the Nursing Diagnosis

Interventions should alter the etiological ("related to") factor or signs and symptoms associated with the diagnostic label.

- When an etiological factor cannot change, direct the interventions toward treating the signs and symptoms (e.g., NANDA International [2009] defining characteristics).
- For potential or high-risk diagnoses, direct interventions at altering or eliminating risk factors for the diagnosis.

Expected Outcomes

Because nurses state outcomes in terms used to evaluate the effect of an intervention, this language assists in selecting the intervention. NIC is designed to show the link to NOC (University of Iowa College of Nursing, 2008).

Evidence Base

Research evidence in support of a nursing intervention indicates the effectiveness of the intervention in certain types of clients.

- Refer to the evidence (e.g., research articles, evidence-informed decision making, or evidence-informed nursing practice protocols that describe the use of the evidence in similar clinical situations and settings).
- When research is not available, use scientific principles (e.g., infection control) or consult a clinical expert about your client population.

Feasibility

A specific intervention has the potential for interacting with other interventions.

- Be knowledgeable about the total plan of care.
- Consider cost: Is the intervention clinically effective and cost efficient?
- Consider time: Are time and personnel resources available?

Acceptability to the Client

A treatment plan needs to be acceptable to the client and/or family and must match the client's goals, health care values, and culture.

- Promote informed choice; help a client know how to participate in and anticipate the effect of interventions.

Capability of the Nurse

The nurse needs to have current knowledge of the intervention, its scientific basis, and considerations for implementation.

- Be prepared to carry out the intervention.
- Know the **scientific rationale** for the intervention.
- Have the necessary psychosocial and psychomotor skills to complete the intervention.
- Be able to function within the specific setting and to use health care resources effectively and efficiently.

Adapted from Bulechek, G. M., Butcher, H. K., & Dochterman, J. M. (2008). *Nursing interventions classification (NIC)* (5th ed.). St Louis, MO: Mosby.

(Box 13-1). During deliberation, review resources such as the nursing literature, standard protocols or guidelines, the Nursing Interventions Classification (NIC), critical pathways, policy or procedure manuals, and textbooks. Collaborate with other professionals, review your clients' needs and priorities, and review your previous experiences to select interventions that have the best potential for achieving the expected outcomes.

► BOX 13-2 Example of Interventions for Physical Comfort Promotion

Class: Physical Comfort Promotion

Interventions to promote comfort [by] using physical techniques

Interventions (Examples)

- Acupressure
- Aromatherapy
- Cutaneous stimulation
- Environmental management
- Heat/cold application
- Nausea management
- Pain management
- Progressive muscle relaxation
- Simple massage

Examples of Linked Nursing Diagnoses

Acute pain
Chronic pain

From Bulechek, G. M., Butcher, H. K., & Dochterman, J. M. (2008). *Nursing interventions classification (NIC)* (5th ed.). St Louis, MO: Mosby.

► BOX 13-3 Example of Interventions and Associated Nursing Activities

Class: Physical Comfort Promotion Intervention-Environmental Management

Examples of Activities

- Create a safe environment for client
- Provide a clean, comfortable bed and environment
- Avoid unnecessary exposure, drafts, overheating, or chilling
- Provide music of choice
- Limit visitors
- Manipulate lighting for therapeutic benefit
- Bring familiar objects from home
- Allow family/significant other to stay with client

From Bulechek, G. M., Butcher, H. K., & Dochterman, J. M. (2008). *Nursing interventions classification (NIC)* (5th ed.). St Louis, MO: Mosby.

Nursing Interventions Classification

The Iowa Intervention Project (1993) developed a set of nursing interventions that provides a level of standardization, which enhances communication of nursing care across all health care settings and enables health care professionals to compare outcomes (Bulechek et al., 2008). The NIC model has three levels: domains, classes, and interventions for ease of use. The domains are the highest level (Level 1) of the model, worded in broad terms (e.g., "safety" and "physiological: basic") to organize the more specific classes and interventions (Table 13-4). The second level of the model includes 30 classes, which offer useful clinical categories for reference in selecting interventions. The third level of the model includes the 514 interventions, defined as any treatment based on clinical judgement and knowledge, that a nurse performs to enhance the condition of a client who presents an alteration within the class (Bulechek et al., 2008) (Box 13-2). Each intervention can be performed with a variety of nursing activities (Box 13-3). Nursing activities are those commonly used in a plan of care. NIC-based interventions are also linked with NANDA

► TABLE 13-4 Nursing Interventions Classification (NIC) Taxonomy

Domain 1	Domain 2	Domain 3	Domain 4	Domain 5	Domain 6	Domain 7
Level 1 Domains						
1. Physiological: Basic Care that supports physical functioning	2. Physiological: Complex Care that supports homeostatic regulation	3. Behavioural Care that supports psychosocial functioning and facilitates lifestyle changes	4. Safety Care that supports protection against harm	5. Family Care that supports the family	6. Health System Care that supports effective use of the health care delivery system	7. Community Care that supports the health of the community
Level 2 Classes						
A. <i>Activity and Exercise Management:</i> Interventions to organize or assist with physical activity and energy conservation and expenditure	G. <i>Electrolyte and Acid-Base Management:</i> Interventions to regulate electrolyte/acid-base balance and prevent complications	O. <i>Behaviour Therapy:</i> Interventions to reinforce or promote desirable behaviours or alter undesirable behaviours	U. <i>Crisis Management:</i> Interventions to provide immediate short-term help in both psychological and physiological crises	W. <i>Childbearing Care:</i> Interventions to assist in understanding and coping with the psychological and physiological changes during the childbearing period	Y. <i>Health System Mediation:</i> Interventions to facilitate the interface between client/family and the health care system	c. <i>Community Health Promotion:</i> Interventions that promote the health of the whole community
B. <i>Elimination Management:</i> Interventions to establish and maintain regular bowel and urinary elimination patterns and manage complications due to altered patterns	H. <i>Drug Management:</i> Interventions to facilitate desired effects of pharmacological agents	P. <i>Cognitive Therapy:</i> Interventions to reinforce or promote desirable cognitive functioning or alter undesirable cognitive functioning	V. <i>Risk Management:</i> Interventions to initiate risk-reduction activities and continue monitoring risks over time	Z. <i>Childrearing Care:</i> Interventions to assist in rearing children	a. <i>Health System Management:</i> Interventions to provide and enhance support services for the delivery of care	d. <i>Community Risk Management:</i> Interventions that assist in detecting or preventing health risks to the whole community
C. <i>Immobility Management:</i> Interventions to manage restricted body movement and the sequelae	I. <i>Neurologic Management:</i> Interventions to optimize neurological functions	Q. <i>Communication Enhancement:</i> Interventions to facilitate delivering and receiving verbal and nonverbal messages		X. <i>Lifespan Care:</i> Interventions to facilitate family unit functioning and promote the health and welfare of family members throughout the lifespan	b. <i>Information Management:</i> Interventions to facilitate communication among health care professionals	

- D. Nutrition Support:**
Interventions to modify or maintain nutritional status
- E. Physical Comfort**
Promotion: Interventions to promote comfort using physical techniques
- F. Self-Care Facilitation:**
Interventions to provide or assist with routine activities of daily living
- J. Perioperative Care:**
Interventions to provide care before, during, and after surgery
- K. Respiratory Management:**
Interventions to provide care before, during, and immediately after surgery
- L. Skin/Wound Management:**
Interventions to maintain or restore tissue integrity
- M. Thermoregulation:**
Interventions to maintain body temperature within a normal range
- N. Tissue Perfusion Management:**
Interventions to optimize circulations of blood and fluids to the tissue
- R. Coping Assistance:**
Interventions to assist another to build on own strength, to adapt to a change in function, or to achieve a higher level of function
- S. Client Education:**
Interventions to facilitate learning
- T. Psychological Comfort**
Promotion: Interventions to promote comfort using psychological techniques

International (2009) nursing diagnoses for ease of use. For example, if a client has a nursing diagnosis of *acute pain*, 21 recommended interventions, including pain management, cutaneous stimulation, and anxiety reduction, may be used. A variety of nursing care activities are presented with each of the recommended interventions.

Planning Nursing Care

In any health care setting, a nurse is responsible for developing a written plan of care for clients. The written plan of care may take several forms (e.g., a nursing card-filing system, standardized care plans, or computerized plans). In general, a written **nursing care plan** includes nursing diagnoses; goals, expected outcomes, or both; and specific nursing interventions, so that any nurse is able to quickly identify a client's clinical needs and situation. In hospitals and community-based settings, the client often receives care from more than one nurse, physician, or allied health provider. A written nursing care plan makes possible continuity and coordination of nursing care and consultation by a number of health professionals.

Written care plans organize information exchanged by nurses in change-of-shift reports (see Chapter 16). You will learn to focus your reports on the nursing care, treatments, and expected outcomes documented in your care plans, and the end-of-shift report allows for discussion of care plans and the overall progress with the next caregiver. The nursing care plan (Box 13-4) provides an example of a care plan for Ms. Devine.

When developing an individualized care plan, involve the client and family, if feasible. The family is a resource for helping the client meet health care goals. In addition, meeting some of the family's needs may improve the client's level of wellness.

Institutional Care Plans

Institutional care plans become part of a client's legal medical record. Many hospitals still use a written Kardex nursing care plan. The **Kardex** card-filing system allows quick reference to the needs of the client for certain aspects of nursing care (see Chapter 15). The care plan section of a Kardex system varies by agency and focuses on planned interventions to meet the needs of the client and family and to prepare the client for discharge from the hospital. The focus of a nursing care plan differs by setting and the evolving client situation. For example, nursing care plans developed for clients returning home are usually based solely on long-term health needs. Nursing care plans for same-day surgeries are usually focused on clients' short-term needs (e.g., immediate recovery from surgery and instructions for self-care at home). In a long-term care facility, plans of care focus on clients' long-term rehabilitation needs.

Computerized Care Plans. A majority of health care facilities now have some type of electronic health record (EHR) and documentation system (Health Canada, 2009). Software programs are available for nursing care plans. In many facilities, the format is for standardized care plans that list generalized nursing diagnoses, goals, outcome criteria, and interventions for specific clients. You need to add or delete information by making selections from menus on the standardized form to individualize it for a client's needs. Computerized and standardized nursing care plans organize and enhance care planning. Their design incorporates current evidence-informed practice guidelines to achieve the desired client outcomes for a specific group of clients.

Care Plans for Community-Based Settings. Planning care for clients in community-based settings—for example, clinics, community centres, or clients' homes—involves using the same principles of nursing practice. In these settings, however, you need to complete a more comprehensive community, home, and family assessment. The client or family unit must be able to provide the majority of health care independently or with external resources provided to meet care demands (see Chapter 4).

Critical Pathways. Critical pathways are multidisciplinary treatment plans that outline treatments or interventions that clients may require for treatment of a condition. Most pathways are based on medical rather than nursing diagnoses, but they incorporate related nursing diagnoses and associated nursing interventions. A critical pathway maps out, day to day or even hour to hour, the recommended interventions and expected outcomes. For example, a pathway for a surgical procedure such as a bowel resection will recommend on a day-by-day basis the client's activities, procedures, and discharge planning activities. A critical pathway improves continuity of care because it clearly maps out the responsibility of each health discipline and can be used to monitor a client's progress. Well-developed pathways incorporate current evidence in caring for clients with a specific condition. When critical pathways are used to plan care, some forms of documentation are eliminated (e.g., the nursing care plan, flow sheets, and nurses' notes) because all of the pertinent components are included in the pathway.

Concept Maps

Concept maps and their use in care planning are described in Chapter 12. The concept map organizes and categorizes nursing concepts to give you a holistic view of your client's health care needs and to help you make better clinical decisions in planning care (Pilcher, 2009). There are different approaches to writing concept maps. A tool for developing your own concept map can be found on the Evolve Web site. Schuster (2003) has suggested some simple steps in preparing for concept mapping and in developing a clinical plan of care:

1. Retrieve the clinical assessment database from the medical record, including health history, physical assessment data, laboratory and diagnostic data, medication history, and treatment plan.
2. Review all information concerning health problems, treatments, and medications in the literature, course textbooks, pharmacology texts, and other resources.
3. On the nursing unit, review standardized nursing care plans, critical pathways, clinical protocols, or client education materials.
4. Develop a preliminary diagram of the client's chief medical diagnosis and the patterns of assessment data that you have gathered. Write the client's major medical diagnoses in the middle of the map, and then add the assessment patterns like spokes on a wheel (see Chapter 12). Identify and group the related patterns of clinical assessment and medical history data. Sometimes symptoms apply to more than one nursing diagnosis. Repeat symptoms under different categories when appropriate: for example, when pain is a symptom of both a problem with comfort and a problem with mobility.
5. Review your assessment patterns and attempt to identify the nursing diagnoses (see Chapter 12). Do not worry if you have difficulty developing nursing diagnoses at first. It is

► BOX 13-4 NURSING CARE PLAN

Acute Pain

Assessment

Ms. Devine is a 52-year-old woman who was injured in a fall two months ago that caused rupture of a lumbar disc. She is scheduled for a lumbar laminectomy this afternoon. Ms. Devine is the office manager for a realty business she runs with her husband. She was

not able to work regularly over the first month after the injury. She has sciatic pain that is sharp and burning, radiating down from her right hip to her right foot. The pain worsens when she sits. Her vital signs are as follows: temperature 37.3°C; blood pressure, 138/82 mm Hg; pulse, 84 beats per minute; and respirations, 24 breaths per minute.

Assessment Activities

Observe client's body movements.

Findings and Defining Characteristics*

Client limps *slightly with right leg*. Turns in bed slowly.

Observe client's facial expression.

Client *grimaces* when she attempts to sit down.

Ask client to rate pain at its worst.

Client *rates pain on a scale of 0 to 10 at an 8 or 9 at its worst*.

*Defining characteristics are in italic type.

Nursing Diagnosis: Acute pain related to pressure on spinal nerves

Planning

Goal (Nursing Outcomes Classification)[†]

Pain Control

Client will achieve improved pain control before surgery.

Expected Outcomes

Knowledge of Treatment Procedures

Client's self-report of pain will be 3 or less on a scale of 0 to 10.

Client's facial expressions reveal less discomfort when turning and repositioning.

[†]Outcomes classification labels from Moorhead, S., Johnson, M., Maas, M., & Swanson, E. (Eds.). (2008). *Nursing outcomes classification (NOC)* (4th ed.). St. Louis, MO: Mosby.

Interventions (Nursing Interventions Classification)[†]

Analgesic Administration

Set positive expectations regarding effectiveness of analgesics.

Optimizes client's response to medication (Bulechek et al., 2008).

Give analgesic 30 minutes before turning or positioning client and before pain increases in severity.

Medication will exert peak effect when client increase movement.

Pain Management

Reduce environmental factors in client's room (e.g., noise, lighting, temperature extremes).

Pleasurable sensory stimuli reduce pain perception.

Offer client information about any procedures and efforts at reducing discomfort.

Information satisfies client's interests and enables client to evaluate and communicate pain (McCaffery & Pasero, 1999).

Progressive Muscle Relaxation

Direct client through progressive muscle relaxation exercise.

Coach client through exercise.

Relaxation techniques enable self-control when pain develops, reversing the cognitive and affective-motivational component of pain perception.

[†]Intervention classification labels from Bulechek, G. M., Butcher, H. K., & Dochterman, J. M. (2008). *Nursing interventions classification (NIC)* (5th ed.). St. Louis, MO: Mosby.

Evaluation

Nursing Actions

Ask client to report severity of pain 30 minutes after analgesic administration.

Client Response and Finding

Ms. Devine reports pain at a level 5 on a scale of 0 to 10.

Achievement of Outcome

Pain is reduced, necessitates further nonpharmacological intervention to achieve outcome.

Observe client's facial expressions.

Ms. Devine is observed to have a relaxed facial expression.

Client's level of comfort is improving.

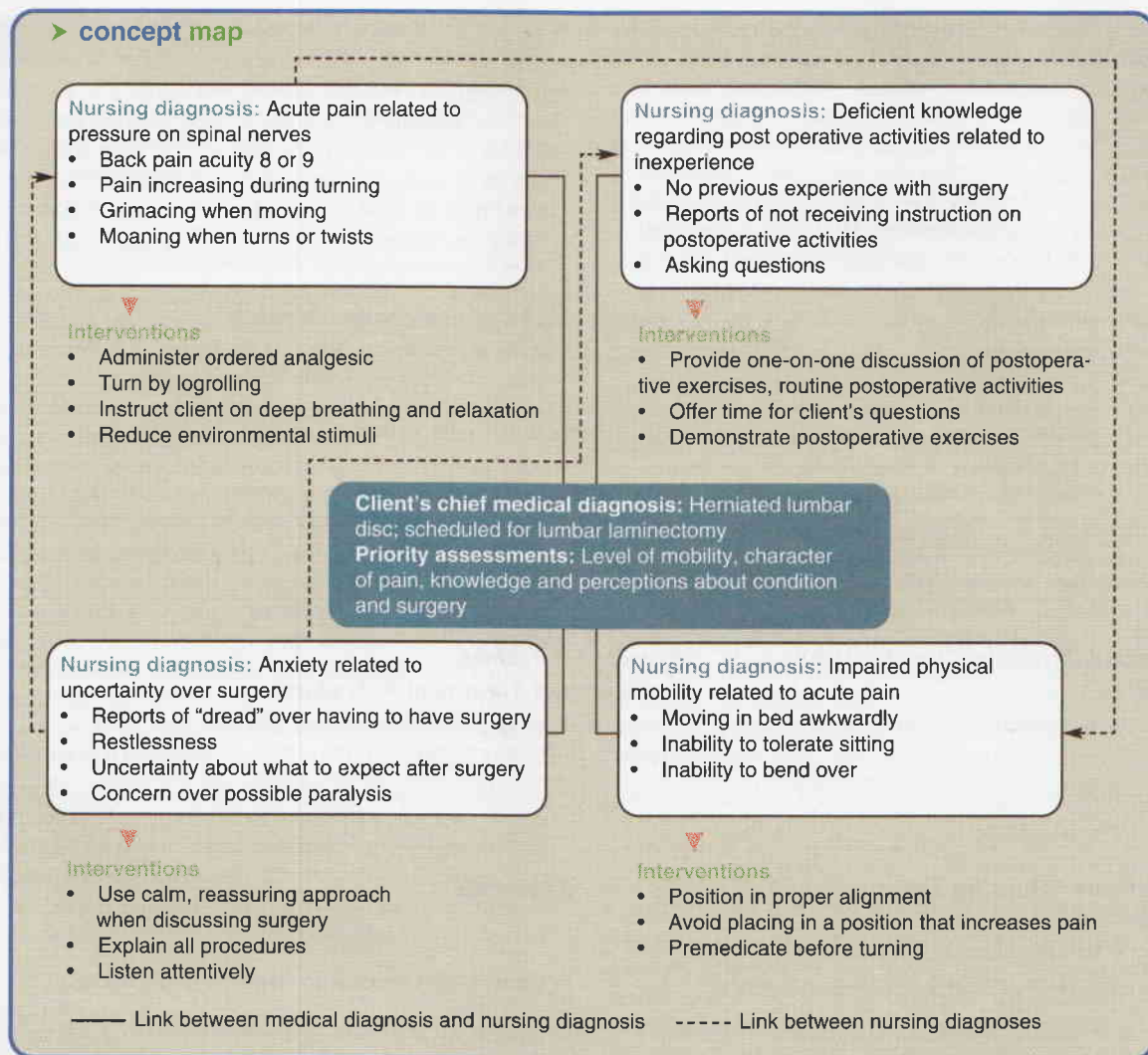


Figure 13-4 Concept map for planning Ms. Devine's nursing care.

important to recognize the major nursing care focus for the client. Add diagnostic statements later if necessary.

6. Analyze relationships among nursing diagnoses, and draw dotted lines between them to indicate relationships (Figure 13-4). It is important for you to make meaningful associations between concepts because the links need to be accurate, meaningful, and complete. You need to be able to explain why nursing diagnoses are related. For example, in the case of Ms. Devine, anxiety and acute pain are interrelated, and pain is a cause of her reduced mobility.
7. List nursing interventions to attain the outcomes for each nursing diagnosis (see Figure 13-4). This step corresponds to the planning phase of the nursing process.
8. While caring for the client, use the map to write down the client's responses to each nursing activity. Note your clinical impressions and inferences about effectiveness of interventions and progress toward meeting expected outcomes.
9. Keep the concept map with you throughout the clinical day. As you revise the plan, take notes and add or delete nursing interventions. Use the information recorded on the map for your documentation of client care.

Concept maps help nurses link concepts such as nursing diagnoses and to identify relationships between them to organize and understand information.

Consulting Other Health Care Professionals

Planning involves **consultation** with members of the health team. Although consultation can occur at any step in the nursing process, it occurs most often during planning and implementation, when problems necessitating additional knowledge, skills, or resources arise. Consulting involves seeking the expertise of a specialist, such as a nurse educator, registered nurse, or clinical nurse specialist to identify ways of approaching and managing the planning and implementation of therapies.

Nurse consultants frequently offer advice about difficult clinical problems. For example, a nursing student will consult with the registered nurse assigned to the same client about ways to individualize interventions, with a clinical specialist for wound care techniques, or with an educator for useful teaching resources. Nurses are consulted for their clinical

expertise, client education skills, or staff education skills. Nurses also consult with other members of the health care team, such as physical therapists, nutritionists, and social workers.

Implementing Nursing Care

Lisa enters Ms. Devine's room to administer morphine sulphate ordered for her severe back pain. The client is probably not going to the operating room for another four to six hours, so Lisa aims to reduce the client's discomfort before then. Lisa administers the medication, using physical care principles to promote safety and prevent infection. She communicates with Ms. Devine in a calm and reassuring manner to allay anxiety. Lisa explains that she will return to Ms. Devine's room in about 30 minutes to help her turn and become comfortable and to offer basic instruction about anticipated postoperative routines. Lisa's interventions are designed to prepare Ms. Devine for her upcoming surgery.

Implementation. With a care plan based on clear and relevant nursing diagnoses, you initiate interventions that are most likely to achieve goals and expected outcomes needed to support or improve the client's health status. A **nursing intervention** is any treatment, based on clinical judgement and knowledge, to enhance client outcomes (Bulechek et al., 2008). Ideally, interventions are evidence informed (see Chapter 6), providing the most current, up-to-date, and effective approaches addressing client problems and include both direct and indirect care measures.

Direct care interventions are treatments performed through interactions with clients. For example, a client receives direct intervention in the form of medication administration, insertion of an intravenous infusion, or counselling during a time of grief. Indirect care interventions are treatments performed away from the client but on behalf of the client or group of clients (Bulechek et al., 2008). For example, indirect care measures include actions for managing the client's environment (e.g., safety and infection control), documentation, and interdisciplinary collaboration. Both direct and indirect care measures can be nurse-initiated, physician-initiated, and collaborative interventions. For example, client teaching is a direct, nurse-initiated intervention. The indirect intervention of consultation is a collaborative intervention.

Each intervention is rendered within the context of a client's unique situation. As you learn to intervene for a client, consider the context of the clinical situation. What is the client's particular situation? Why do you need to intervene in the clinical situation? How does the client perceive your proposed interventions? How can you support the client as you intervene? The answers to these questions enable you to deliver care compassionately and effectively with the best outcomes for your clients.

Critical Thinking in Implementation

The selection of nursing interventions involves complex decision making and is based on critical thinking to ensure that an intervention is correct and appropriate for the clinical situation. Even though you have planned a set of interventions for a client, good judgement, decision making, and reassessment are needed before each intervention is actually performed, understanding that clients' conditions sometimes change rapidly. Some points to consider when you work with clients to meet their needs are as follows:

- Review the set of all possible nursing interventions for the client's problem (e.g., for Ms. Devine's pain, Lisa considers analgesic administration, positioning, relaxation, and other nonpharmacological approaches).
- Review all possible consequences associated with each possible nursing action (e.g., Lisa considers that the analgesic may relieve pain, may have little or insufficient effect, or may cause an adverse reaction).
- Determine the probability of all possible consequences (e.g., if Ms. Devine's pain has decreased with analgesia and positioning in the past, it is unlikely adverse reactions will occur, and the intervention will probably be successful; however, if the client continues to remain highly anxious, her pain may not be relieved).
- Determine the effect of the intervention on the client (e.g., if the administration of an analgesic is effective, Ms. Devine will become less anxious and will be more responsive to preoperative instruction).

The selection and performance of nursing interventions for a client is part of clinical decision making. The critical thinking model described in Chapter 11 provides a framework for making decisions about nursing care. As you proceed with an intervention, you should consider the purpose of the intervention, the steps in performing the intervention correctly, and the client's health status (Figure 13-5). It is essential to know the clinical standards of practice of each agency because procedures and standards of practice vary considerably. The standards of practice are guidelines for nursing practice and sanction principles to provide safe and competent care.

Standard Nursing Interventions

To facilitate good care planning, systems of standard nursing interventions are available to help you. These are based on common health care problems for which standard interventions can serve as a reference point in determining what is necessary. Of more importance, if the standards are informed by evidence, interventions are more likely to improve client outcomes (see Chapter 6). Standard interventions, both nurse initiated and physician initiated, are available in the form of clinical guidelines or protocols, preprinted medical directives or standing orders, and NIC-based interventions.

Clinical Practice Guidelines and Protocols

A clinical guideline or protocol is a document that guides decisions and interventions for specific health care problems. The guideline or protocol is developed on the basis of an authoritative examination of current scientific evidence and assists nurses, physicians, and other health care professionals in making decisions about appropriate health care for specific clinical circumstances. Clinicians within a health care agency sometimes choose to review the scientific literature and their own standard of practice to develop guidelines and protocols in an effort to improve their standard of care. For example, a hospital develops a rapid assessment protocol to improve the identification and early treatment of clients suspected of having a stroke. Clinical practice guidelines also assist you in providing the best possible care. The *Best Practice Guidelines* developed by the Registered Nurses' Association of Ontario (RNAO) (2012) is an excellent example of these.

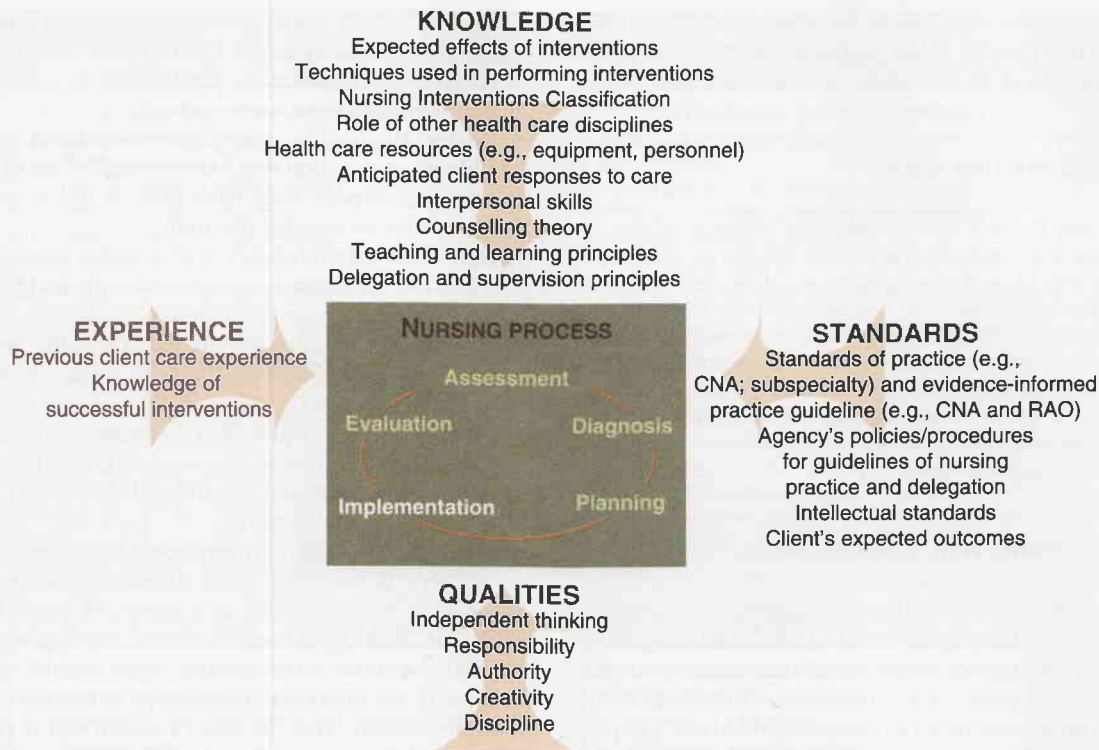


Figure 13-5 Critical thinking and the process of implementing care.

Medical Directives or Standing Orders

A **medical directive** or **standing order** is a statement of orders for the conduct of routine therapies, monitoring guidelines, or diagnostic procedures, or a combination of these, for specific clients with identified clinical problems. These statements direct client care in various clinical settings and must be approved and signed by the prescribing physician or health care professional. Medical directives or standing orders are common in critical care settings and other specialized practice settings in which clients' needs change rapidly and require immediate attention. Examples include those for preoperative blood tests, those for postoperative exercises and positioning, and those for certain medications (such as heparin) for blood coagulation. When these statements are in place, the critical care nurse may administer the specified medication or conduct the specified action without first notifying the physician. Medical directives or standing orders are also common in community health settings in which physicians are not immediately available for consultation. Medical directives, standing orders, and clinical protocols give the nurse legal protection to intervene appropriately in the client's best interest.

Nursing Intervention Classifications System

The NIC system developed at the University of Iowa helps differentiate nursing practice from the practice of other health care professionals (Box 13-5; see also Box 13-2). The NIC-based interventions are common interventions recommended for various NANDA International (2009) nursing diagnoses and care activities for NIC-based interventions. They define a level of standardization for nursing care across settings and for comparison of outcomes.

BOX 13-5

Purposes of the Nursing Interventions Classification (NIC)

1. Standardization of the nomenclature (e.g., labelling, describing) of nursing interventions. Standardizes the language nurses use to describe sets of actions in delivering client care.
2. Expansion of nursing knowledge about connections between nursing diagnoses, treatments, and outcomes. These connections will be determined through the study of actual client care through the use of a database that the classification will generate.
3. Development of nursing and health care information systems.
4. Teaching decision making to nursing students. Defining and classifying nursing interventions help teach beginning nurses how to determine a client's need for care and to respond appropriately.
5. Determination of the cost of services provided by nurses.
6. Planning for resources needed in all types of nursing practice settings.
7. Language to communicate the unique functions of nursing.
8. Link with the classification systems of other health care providers.

Adapted from Bulechek, G. M., Butcher, H. K., & Dochterman, J. M. (2008). *Nursing interventions classification (NIC)* (5th ed.). St Louis, MO: Mosby.

Implementation Process

Preparation for implementation ensures efficient, safe, and effective nursing care. Preparatory activities include reassessing the client, reviewing and revising the existing nursing care plan, organizing resources and care delivery, anticipating

and preventing complications, and implementing nursing interventions.

Reassessing the Client

Assessment is a continuous process that occurs each time you interact with a client. When you collect new data and identify a new client need, you modify the care plan. You also modify a plan when you resolve a client's health care need. During the initial phase of planning nursing care, the preliminary assessment may focus on one dimension of the client, such as level of comfort, or on one system, such as the cardiovascular system. Reassessment helps you decide whether the proposed nursing action continues to be appropriate for the client's level of wellness. For example, Lisa plans to spend a few minutes talking further with Ms. Devine about her concerns relating to surgery. However, her reassessment reveals that Ms. Devine is still a bit uncomfortable and fatigued, and so Lisa must postpone her discussion. She decides to discuss Ms. Devine's concerns when she begins preoperative teaching in 30 minutes.

Reviewing and Revising the Existing Nursing Care Plan

After reassessing a client, review the care plan, compare assessment data in order to validate the nursing diagnoses, and determine whether the nursing interventions remain the most appropriate for the client's situation. If the client's status has changed and the nursing diagnosis and related nursing interventions are no longer appropriate, modify the nursing care plan. An outdated or incorrect care plan compromises quality of nursing care. Review and modification enables you to provide timely and appropriate nursing interventions. Modification of the existing written care plan has four steps:

1. Revise data in the assessment column to reflect current status. Date any new data to communicate the time of the change.
2. Revise the nursing diagnoses. Delete those that are no longer relevant, and add and date any new ones.
3. Revise specific interventions that correspond to the new nursing diagnoses and goals.
4. Determine the method of evaluation for any outcomes achieved.

It has been 45 minutes since Ms. Devine received an analgesic for her pain. She reports less discomfort, so Lisa initiates preoperative instruction. After about 10 minutes of discussion, Lisa notes that Ms. Devine expresses less concern about surgery; Ms. Devine says, "I feel better now that I understand what surgery involves." Ms. Devine's movements are calmer and less restless. Lisa enters her new findings into the care plan. However, she decides not to delete the nursing diagnosis of anxiety just yet and adds an intervention to her plan: Encourage verbalization of client's remaining concerns about surgery (see Figure 13-2). Seeing that Ms. Devine responded well to the analgesic, Lisa also adds more nonpharmacological interventions to her plan for pain management.

Organizing Resources and Care Delivery

A facility's resources include equipment and skilled personnel. Organization of equipment and personnel makes timely, efficient, skilled client care possible. Preparation for giving care involves preparing the environment, as well as clients.

Equipment. Most nursing procedures require some equipment or supplies. Before you perform an intervention, you must identify which supplies are needed, determine whether they are available, and ensure that equipment is in

working order and that you are skilled in operating the equipment to ensure safe use.

Personnel. You are responsible for determining whether to perform an intervention or to delegate it to another member of the nursing team. Your assessment of a client directs delegation decisions. For example, practical nurses are accountable and liable for their own practice and able to competently care for a stable and predictable clients. If you learned in the change-of-shift report that a particular client is experiencing cardiac irregularities, changing the client's status to unstable, you must assume primary care until the client's condition stabilizes (Canadian Nurses Association, 2011; College of Licensed Practical Nurses of Nova Scotia, 2011). Your judgement is important for determining the health status of the client and identifying the appropriate care provider.

Environment. A care environment needs to be safe and conducive to the implementation of therapies. Client safety is your first concern. You must anticipate circumstances that place clients at risk and create a culture of client safety (Canadian Client Safety Initiative, 2011). If the client has sensory deficits, a physical disability, or an alteration in level of consciousness, arrange the environment to prevent injury. Ensure privacy during procedures that may require some body exposure. Also, ensure that lighting is adequate for performing procedures correctly (see Chapter 36).

Client. Before you provide care, be sure the client is as physically and psychologically comfortable as possible. Ensure the client is comfortable during interventions. Control environmental factors at the outset, taking care of physical needs (e.g., elimination), minimizing the potential for interruptions, and positioning the client correctly. Consider the client's strength and endurance, and plan only the level of activity that the client is able to tolerate comfortably. Awareness of the client's psychosocial needs helps you create a favourable emotional climate. Some clients feel reassured by having a significant other present for encouragement and moral support.

Anticipating and Preventing Complications

Risks to clients arise from both illness and treatment. Be alert for and recognize these risks, adapt your choice of interventions to the situation, evaluate the benefit of the treatment in relation to the risk, and, finally, initiate risk-prevention measures (Figure 13-6). Many conditions heighten the risk for complications. For example, the client with preexisting left-sided paralysis that followed a stroke two years earlier is at risk for developing a pressure ulcer after orthopedic surgery because postoperative care entails traction and bed rest.

Your knowledge of pathophysiology and your experience with previous clients help you identify risk of complications. A thorough assessment reveals the level of the client's current risk. The scientific rationale, which concerns how certain interventions (e.g., pressure-relief devices, repositioning, or wound care) prevent or minimize complications, helps you select the most useful preventive measures. For example, if an obese client has uncontrolled postoperative pain, the risk for pressure ulcer development increases because the client may be unwilling or unable to change position frequently. The nurse anticipates when the client's pain will be aggravated, administers ordered analgesics, and then positions the client to remove pressure on the skin and underlying tissues. If the client continues to have difficulty turning or repositioning, the nurse may then select a pressure-relief device to place on the client's bed.

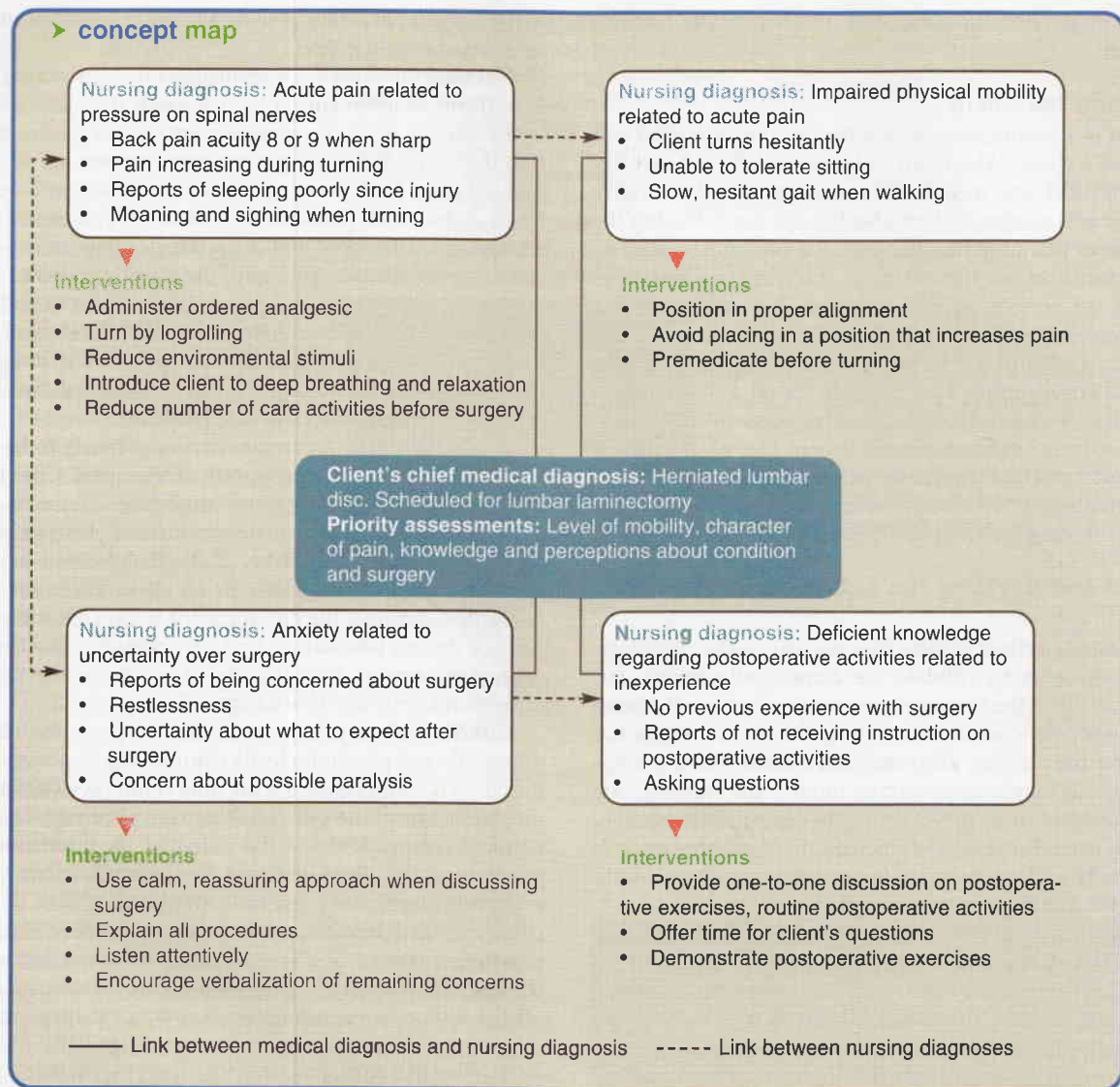


Figure 13-6 Concept map for planning Ms. Devine's postoperative nursing care.

Identifying Areas of Assistance. Certain nursing situations require you to obtain assistance by seeking additional knowledge, nursing skills, unregulated care providers, or a combination of these. Before you begin care, review the plan to determine the need for assistance. Sometimes you need assistance in performing a procedure, comforting a client, or preparing the client for a diagnostic test. For example, when you care for an overweight, immobilized client, you may require additional personnel to help turn and position the client safely. Be sure to determine the number of additional personnel in advance by consulting with other members of the health care team.

You require additional knowledge and skills in situations with which you are less familiar or experienced. In these situations, you need to prepare by seeking the necessary knowledge and requesting assistance from a more experienced nurse.

Implementation Skills

Nursing practice includes cognitive, interpersonal, and psychomotor (technical) skills. You need each type of skill to

implement direct and indirect nursing interventions. You are responsible for knowing which skill is needed in a particular situation and for having the necessary knowledge and ability to perform each one.

Cognitive Skills. Cognitive skills involve the application of critical thinking in the nursing process. To perform any intervention, always use good judgement and make sound clinical decisions. No nursing intervention is automatic or routine. You must continually think and anticipate so that you individualize care for clients. For example, Lisa knows the pathophysiological process of a ruptured disc, the anatomy of the spinal cord, and normal pain mechanisms. She considers each of these as she observes Ms. Devine, noting how the client's movement, posture, and position either aggravate or lessen her back pain. Lisa focuses on relieving Ms. Devine's acute pain with an analgesic but then considers the noninvasive interventions needed to minimize stress on the back so that the client will remain comfortable.

Interpersonal Skills. Interpersonal skills are essential for effective nursing action. The nurse develops a trusting

relationship, expresses a caring attitude, and communicates clearly with the client and family (see Chapter 18). Good interpersonal communication is crucial for keeping clients informed, providing individualized client teaching, and effectively supporting clients with challenging emotional needs.

Psychomotor Skills. Psychomotor skills require the integration of cognitive and motor activities. For example, when giving an injection, you need to understand anatomy, physiology, and pharmacology (cognitive skills) and use good coordination and precision to administer the injection correctly (motor skills). You are responsible for acquiring necessary psychomotor skills, through your experience in the nursing laboratory, through the use of interactive instructional technology, or through actual hands-on care of clients. In the case of a new skill, always assess your level of competency and obtain the necessary resources to ensure that the client receives safe treatment.

Direct Care

Nurses provide a wide variety of direct care measures. How a nurse interacts affects the success of any direct care activity, and a caring approach is essential. You need to be sensitive at all times to a client's clinical condition, values and beliefs, expectations, and cultural views. All direct care measures require safe and competent practice.

Activities of Daily Living

Activities of daily living (ADLs) are activities usually performed in the course of a normal day, including ambulation, eating, dressing, bathing, brushing the teeth, and grooming (see Chapter 37). A client's need for assistance with ADLs is temporary, permanent, or rehabilitative. A client with impaired mobility because of bilateral arm casts has a temporary need for assistance. A client with an irreversible injury to the cervical spinal cord is paralyzed and thus has a permanent need for assistance. Occupational and physical therapists play key roles in rehabilitation to restore ADL function.

When your assessment reveals that a client is experiencing fatigue, a limitation in mobility, confusion, and pain, the client needs assistance with ADLs. For example, a client who experiences shortness of breath avoids eating because of the associated fatigue. Assist the client by setting up meals, offering to cut up food, and planning for small and frequent meals to maintain nutrition. Determine the client's preferences when you assist with ADLs, and let the client participate as much as possible. Involving the client in planning the timing and types of interventions enhances the client's self-esteem and willingness to assume more independence.

Instrumental Activities of Daily Living

Illness or disability sometimes alters a client's ability to be independent in society. **Instrumental activities of daily living (IADLs)** include such skills as shopping, preparing meals, writing cheques, and taking medications. Nurses within the home care and community health care settings frequently assist clients in finding ways to accomplish IADLs. Often, family and friends are excellent resources for assisting clients. In acute care, it is important to anticipate how illness will affect the client's ability to perform IADLs and to involve other health professionals such as occupational therapists or social workers.

Physical Care Techniques

You routinely perform a variety of physical care techniques when caring for a client. Examples include turning and positioning, changing dressings, administering medications, and providing comfort measures. Considerations in providing physical care include protecting yourself and the client from injury, using infection control practices, following applicable practice guidelines, and staying organized. To carry out a procedure, you need to be knowledgeable about the procedure and how to perform it and about the expected outcomes.

Life-Saving Measures

A **life-saving measure** is a physical care technique performed when a client's physiological or psychological state is threatened (see Chapter 38). The purpose of life-saving measures is to restore physiological or psychological equilibrium. Such measures include administering emergency medications, instituting cardiopulmonary resuscitation, intervening to protect a confused or violent client, and providing a safe environment for a client experiencing a mental health crisis.

Counselling

Counselling is a direct care method that helps the client use a problem-solving process to recognize and manage stress and to facilitate interpersonal relationships. Counselling involves emotional, intellectual, spiritual, and psychological support. A client and family who need nursing counselling may be upset or frustrated, but they are not necessarily disabled psychologically. Family caregivers need assistance in adjusting to the physical and emotional demands of caregiving. Likewise, the recipient of care also needs assistance in adjusting to the disability. Clients with psychiatric diagnoses require therapy provided by psychiatric nurses or by social workers, psychiatrists, or psychologists.

Many counselling techniques foster cognitive, behavioural, developmental, experiential, and emotional growth in clients. Most of the techniques listed in Box 13-3 require additional knowledge beyond the scope of this text. Counselling encourages individuals to examine available alternatives and decide which choices are useful and appropriate.

Teaching

Teaching is an important nursing responsibility and is related to counselling. Both involve using communication skills to create a change in the client. However, in counselling, the focus is on the development of new attitudes and feelings, whereas in teaching, the focus is on intellectual growth or the acquisition of new knowledge or psychomotor skills (Redman, 2005).

The purpose of health teaching is to help clients learn about their health status, ways of promoting health, and ways of caring for themselves. Some common examples of teaching by nurses are related to medication administration, activity restrictions, health promotion activities (e.g., diet, exercise, or smoking cessation), and knowledge about disease and related implications. Your role includes assessment of clients' learning needs and readiness to learn. It is important to know your client and to be aware of cultural and social factors that influence a client's willingness and ability to learn. It is also important to know the client's health literacy levels: that is, whether the client can read directions or make calculations that sometimes are necessary with self-care skills. The teaching-learning process is an interaction between you and the client in which you address specific learning objectives (see Chapter 20).

Controlling for Adverse Reactions

An **adverse reaction** is a harmful effect of a medication, diagnostic test, or therapeutic intervention. You are responsible for knowing the potential adverse reactions associated with the nursing interventions you provide or perform for a client. Nursing actions that control for adverse reactions reduce or counteract the reaction. For example, when applying a moist heat compress, you must take steps to prevent burning the client's skin. First, assess the area where the compress is to be applied. Then inspect the area every five minutes for any adverse reaction, such as excessive reddening of the skin from the heat or skin maceration from the moisture of the compress. When completing a physician-initiated intervention, such as medication administration, you need to know about the potential side effects and adverse reactions of the medication. After administration of the medication, you evaluate the client for the expected outcomes and any side effects or adverse reactions. You need to be knowledgeable about medications that counteract the side effects or have adverse reactions. For example, a client has an unknown hypersensitivity to penicillin, and hives develop after three doses. You record the reaction, stop further administration of penicillin, and consult with the physician. You then anticipate an order for diphenhydramine (Benadryl), an antihistamine and antipruritic medication, to reduce the adverse reaction or allergic response and to relieve the itching.

Preventive Measures

Preventive nursing actions promote health and prevent illness in order to avoid the need for acute or rehabilitative health care. Prevention includes assessment and promotion of the client's health potential, carrying out prescribed measures (e.g., immunizations), health teaching, and identification of risk factors for illness, trauma, or both. Consider, for example, the case of Ms. Devine. Lisa learns that her client does not exercise regularly. Ms. Devine is 167.6 cm tall and weighs 72.7 kg. Because she is overweight and inactive, she is at risk when she performs activities that place stress on her back. If the client is able to lose some weight and start exercise therapy, she will be less likely to reinjure her back. Lisa plans to consult with the surgeon and physical therapist after surgery to design a plan to help Ms. Devine with weight loss and strengthening of back muscles.

Indirect Care

Indirect care measures are actions that support the effectiveness of direct care interventions (Bulechek et al., 2008). Nurses spend a good amount of time in indirect care activities (Box 13-6). Communication of information about clients (e.g., change-of-shift report and consultation) is essential to ensure that direct care activities are planned, coordinated, and performed with the proper resources.

Communicating Nursing Interventions

Any intervention you provide for a client will be communicated in a written or oral format, or both. Written interventions are part of both the nursing care plan and the permanent medical record. In a nursing care plan, there are collaborative interventions that represent the contributions of all disciplines involved in caring for a client. For example, when Ms. Devine begins recovering from back surgery, her nursing diagnosis of *impaired physical mobility* will identify interventions initiated

► BOX 13-6

Examples of Indirect Care Activities

- Documentation
- Delegation of care activities to unregulated care providers
- Medical order transcription
- Infection control (e.g., proper handling and storage of supplies, use of protective isolation)
- Environmental safety management (e.g., make client rooms safe, strategically assigning clients in a geographic proximity to a single nurse)
- Computer data entry
- Telephone consultations with physicians and other health care providers
- Change-of-shift report
- Collecting, labelling, and transporting laboratory specimens
- Transporting clients to procedural areas and other nursing units

Adapted from Bulechek, G. M., Butcher, H. K., & Dochterman, J. M. (2008). *Nursing interventions classification (NIC)* (5th ed.). St Louis, MO: Mosby.

by nurses (e.g., nonpharmacological pain control and positioning), by the surgeon (e.g., activity guidelines and pharmacological pain control), and by the physical therapist (e.g., ambulation training and exercises).

After completing nursing interventions, you document the treatment and client's response in the appropriate record (see Chapter 15). The entry usually includes a brief description of pertinent assessment findings, the specific procedure, the time and details of the procedure, and the client's response. You also communicate nursing interventions verbally to other health care professionals. Unless communication is clear, concise, accurate, and timely, caregivers can be uninformed, interventions may be needlessly duplicated, procedures may be delayed, or tasks may be left undone.

Delegating, Supervising, and Evaluating the Work of Other Staff Members

Depending on the staffing system, not all of the nursing interventions may be performed by the nurse who develops the care plan. Some activities are delegated to other members of the health care team. Interventions such as skin care, ambulation, grooming, measuring vital signs in stable clients, and hygiene measures are examples of care activities that you may assign to unregulated care providers. When a nurse delegates aspects of a client's care to another staff member, the nurse assigning tasks is responsible for ensuring that each task is appropriately assigned and completed.

Achieving Client-Centred Goals

You implement nursing care to meet client-centred goals and outcomes. In most clinical situations, multiple interventions are necessary to achieve selected outcomes. Because clients' conditions may change rapidly, it is important to apply principles of care coordination, such as good time management, organizational skills, and appropriate use of resources, to ensure that you deliver interventions effectively and that clients achieve desired outcomes. Priority setting is also crucial in successful implementation because it helps you to anticipate and sequence nursing interventions when a client has multiple

nursing diagnoses and collaborative problems. Another way to achieve client-centred goals is to encourage and assist clients to follow their treatment plan. Consultation and collaboration are critical to achieving the client's goals and expected outcomes.

Effective discharge planning and teaching for clients and families require individualized care that is consistent with culture and health beliefs. The process should be initiated at the outset of care. Adequate and timely discharge planning and education of the client and family are the first steps in promoting a smooth transition from one health care setting to another or to home. To be effective with discharge planning and education, you individualize your care and take into consideration the various factors that influence a client's health beliefs. For example, to help Ms. Devine adopt better exercise habits when she returns home, Lisa needs to determine what knowledge and psychosocial factors may influence Ms. Devine to exercise when she returns home. Reinforcing successes with the treatment plan encourages clients to follow their care plans.

✦ KEY CONCEPTS

- During planning, you determine client-centred goals, set priorities, develop expected outcomes of nursing care, and develop a nursing care plan.
- Priority setting helps you anticipate and sequence nursing interventions when a client has multiple nursing diagnoses and collaborative problems.
- Multiple factors in the nursing care environment influence your ability to set priorities.
- Goals and expected outcomes provide clear direction for the selection and use of nursing interventions and provide focus for evaluation of the effectiveness of the interventions.
- In setting goals, the time frame depends on the nature of the problem, etiology, overall condition of the client, and treatment setting.
- A client-centred goal is singular, observable, measurable, time limited, mutual, and realistic.
- An expected outcome is an objective criterion for goal achievement.
- Care plans and critical pathways increase communication among nurses and facilitate the continuity of care from one nurse to another and from one health care setting to another.
- A concept map provides a visually graphic way to understand the relationship between a client's nursing diagnoses and interventions.
- The NIC taxonomy provides a standardization to assist you in selecting suitable interventions for clients' problems.
- Correctly written nursing interventions include actions, frequency, quantity, and method, and they specify the person to perform them.
- Consultation and collaboration increase your knowledge about a client's problem and help you learn skills and obtain the resources needed to solve the problem.
- Implementation is the step of the nursing process in which you provide direct and indirect nursing care interventions to clients.
- Clinical guidelines or protocols are evidence-informed documents that guide decisions and interventions for specific health care problems.
- During the initial phase of implementation, you reassess the client to determine whether the proposed nursing action is still appropriate for the client's level of wellness.
- To anticipate and prevent complications, you identify risks to the client, adapt interventions to the situation, evaluate the benefit of a treatment in relation to the risk, and initiate risk-prevention measures to create a culture of client safety.
- Successful implementation of nursing interventions requires you to use appropriate cognitive, interpersonal, and psychomotor skills.
- Counselling is a direct care method that helps clients use problem solving to recognize and manage stress and to facilitate interpersonal relationships.
- Preventive nursing actions include assessment and promotion of the client's health potential, application of prescribed measures (e.g., immunizations), health teaching, and identification of risk factors for illness, trauma, or both.

✦ CRITICAL THINKING EXERCISES

Shawn, a nurse, has two different clients. Mr. Gordon is a 52-year-old client who was admitted to the hospital after a motor vehicle accident. He suffered rib fractures and has a laceration along his right thigh. Shawn has identified the following nursing diagnoses: *ineffective breathing pattern related to chest pain*, *acute pain related to musculoskeletal trauma*, and *risk for infection related to open wound*. Shawn's second client, Ms. Lawrence, is a 63-year-old woman who had surgery yesterday evening for repair of a foot fracture. Her foot is in a cast. Ms. Lawrence's nursing diagnoses include *acute pain related to tissue swelling*, *impaired mobility related to restricted movement from cast*, and *deficient knowledge regarding cast care related to inexperience*. Ms. Lawrence will probably be discharged in the morning. She lives alone. Shawn begins to plan care by establishing goals and outcomes for the nursing diagnoses.

1. Between the two clients, which diagnoses are high priority and which ones are intermediate priority?
2. Of the two clients, which one has higher priority regarding pain management?
3. For the nursing diagnosis *deficient knowledge regarding cast care related to inexperience*, write one goal and two expected outcomes.

Sue is a nursing student. She is to care for Mr. Nelson, a 63-year-old client who was admitted to the hospital with congestive heart failure and pneumonia. He is receiving medications to improve his heart failure and intravenous antibiotics to treat his pneumonia. He reports becoming fatigued easily during care activities and states, "I feel short of breath if I try to do too much." Sue notes he has 3+ edema in his lower extremities. Sue has identified nursing diagnoses of *decreased cardiac output* and *activity intolerance*. Sue must still perform hygiene measures, change the client's intravenous dressing, get him up into a chair, and measure noontime vital signs.

1. Before she begins to intervene, how can Sue make Mr. Nelson more comfortable?
2. What objective data does Sue obtain as part of her nursing assessment? What nursing actions may be implemented based on this information?
3. Because Sue thinks that Mr. Nelson may be at risk of falling, she decides to get assistance from a colleague before trying to get him into a chair. This is an example of what type of implementation skill?
4. When changing Mr. Nelson's intravenous dressing, Sue cleans the insertion site in accordance with clinical practice guidelines and checks the site for signs of phlebitis. These steps are examples of what type of direct care measure?

✦ REVIEW QUESTIONS

- Sheila, a nurse, is assigned to a client who has returned from the recovery room after surgery for a colorectal tumour. After an initial assessment, Sheila anticipates the need to monitor the client's abdominal dressing, intravenous infusion, and function of drainage tubes. The client is in pain and will not be able to eat or drink until intestinal function returns. Sheila will have to establish priorities of care in which of the following situations? (*Choose all that apply.*)
 - The family comes to visit the client.
 - The client expresses concern about pain control.
 - The client's vital signs change, showing a drop in blood pressure.
 - The charge nurse approaches Sheila and requests a report at end of shift.
- Sheila's client signals with her call light. Sheila enters the room and finds that the drainage tube is disconnected, the intravenous line has 100 mL of fluid remaining, and the client has asked to be turned. Which of the following should Sheila perform first?
 - Reconnect the drainage tubing.
 - Inspect the condition of the intravenous dressing.
 - Improve the client's comfort and turn her onto her side.
 - Go to the medication room and obtain the next intravenous fluid bag.
- In her nursing care plan, Sheila writes expected outcomes for her client. Which of the following expected outcomes are written correctly? (*Choose all that apply.*)
 - Client will remain a febrile until discharge.
 - Intravenous site will be without phlebitis by the third post-operative day.
 - Provide incentive spirometry for deep breathing every two hours.
 - Client will report pain and turn more freely by the first postoperative day.
- The nurse writes an expected outcome statement in measurable terms. An example is
 - Client will be pain free
 - Client will have less pain
 - Client will take pain medication every four hours
 - Client will report pain acuity less than 4 on a scale of 0 to 10
- Collaborative interventions are therapies that require
 - Nurse and client intervention
 - Physician and nurse intervention
 - Client and physician intervention
 - Multiple health care providers
- Nurses are responsible for an individualized written plan of care for clients. It is most important for the nurse to
 - Use a critical pathway to provide a strict plan of care
 - Complete a concept map to comprehensively manage one problem at a time
 - Collaborate with the client and family in the development of the plan
 - Understand that nursing care plans are the same despite different settings and client situations
- A number of different types of nursing interventions may be incorporated into the plan of care. Which of the following interventions is an example of a specific lifesaving measure that the nurse may implement?
 - Administering analgesics
 - Restraining a violent client
 - Initiating stress-reduction therapy
 - Teaching the client how to take his or her pulse
- Environmental factors heavily affect a client's care. Your first concern for the client includes which of the following?
 - Safety
 - Nurse staffing
 - Confidentiality
 - Adequate pain relief
- The nurse may use a concept map when implementing a plan of care. What is the purpose and distinction of a concept map?
 - Quality assurance in the health care facility
 - Identification of the relation of client problems and interventions
 - Multidisciplinary communication
 - Provision of a standardized format for client problems

✦ RECOMMENDED WEB SITES

Center for Nursing Classification & Clinical Effectiveness:

http://www.nursing.uiowa.edu/excellence/nursing_knowledge/clinical_effectiveness/index.htm

The University of Iowa's Center for Nursing Classification and Clinical Effectiveness was established to facilitate ongoing research of the Nursing Interventions Classification (NIC) and Nursing Outcomes Classification (NOC). This Web site provides an overview of the NIC and NOC and offers information about new classification material and publications.

NANDA International: <http://www.nanda.org/>

Through this Web site, NANDA International provides current information on nursing diagnosis research, publications, and Internet resources.

Registered Nurses' Association of Ontario: Best Practices Guidelines: <http://www.rnao.org/bestpractices/>

The Registered Nurses' Association of Ontario has an extensive process for developing best practices guidelines in a variety of areas of clinical nursing. They have received federal and provincial funding for this process, and the results of their work have been made available to all Canadian nurses through this Web site, which lists all current guidelines that have been developed.

Review Question Answers

1. 2, 3; 2. 1, 3, 1; 3. 1, 2; 4. 4; 5. 4; 6. 3; 7. 2; 8. 1; 9. 2

Rationales for the Review Questions appear at the end of the book.

Evaluation of Nursing Care

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objectives

Mastery of content in this chapter will enable you to:

- Define the key terms listed.
- Discuss the relationship between critical thinking and evaluation.
- Identify the five elements of the evaluation process.
- Explain the relationship between goals of care, expected outcomes, and evaluative measures in evaluating nursing care.
- Give examples of evaluation measures for determining a client's progress toward outcomes.
- Evaluate a set of nursing actions selected for a client.
- Describe how evaluation leads to discontinuation, revision, or modification of a plan of care.

key terms

Evaluation, p. 193
Evaluative measures,
p. 196

Outcome, p. 196
Standard of care, p. 199

media resources

evolve WEBSITE

<http://evolve.elsevier.com/Canada/Potter/fundamentals/>

- Audio Chapter Summaries
- Examination Review Questions
- Glossary
- Student Learning Activities
- Weblinks

When a plumber comes to a home to fix a leaking faucet, he or she turns on the faucet to determine the problem, changes or adjusts parts to the faucet, and then turns on the faucet once again to determine whether the leak is fixed. Similarly, after a client with a diagnosis of pneumonia completes a five-day dose pack of antibiotics, the physician often has the client return to the office to have a chest X-ray examination to determine whether the pneumonia has cleared. When a nurse delivers an intervention such as applying a warm compress to a wound, several steps are involved. The nurse assesses the appearance of the wound, determines the severity of the wound, applies the appropriate form of compress, and then returns to determine whether the condition of the wound has improved. These three scenarios depict what ultimately occurs during the process of **evaluation**. The plumber rechecks the faucet, the physician orders a chest X-ray film, and the nurse inspects the wound.

Evaluation involves two components: an examination of a condition or situation and then a judgement as to whether change has occurred. Ideally, after an intervention takes place, evaluation will reveal an improvement.

Chapters 12 and 13 describe how you use critical thinking skills to gather client data, form nursing diagnoses, develop a plan of care, and implement the care plan. Evaluation, the final step of the nursing process, is crucial for determining whether, after application of the nursing process, the client's condition or well-being improves. You apply all that you know about a client and the client's condition, as well as experience with previous clients, to evaluate whether nursing care was effective. *You conduct evaluative measures to determine whether expected outcomes were attained, not whether nursing interventions were completed.* The expected outcomes are the standards against which you judge whether goals have been met and if care is successful.

In the continuing case study, Lisa is now making final preparations to send Ms. Devine to the operating room. Lisa evaluates the interventions she has implemented for the goals of achieving pain control, reducing anxiety, improving mobility, and improving Ms. Devine's knowledge of postoperative activities. Lisa had returned to Ms. Devine's room 30 minutes after administering an analgesic. At that time, the client reported having pain at a level of 4 on a scale of 0 (none) to 10 (worst). Lisa had documented the expected outcome of reduction of pain to a level of 3. Lisa then implemented further non-pharmacological interventions. It is now two hours later, and Lisa finds Ms. Devine lying in bed with her eyes closed. The client awakens as Lisa enters and says, "I just had my eyes closed; I am ready to have my surgery." Lisa says, "Tell me how you are feeling." Ms. Devine responds, "I feel better, and I am a little less worried than when I first got here." Lisa says, "On a scale of 0 to 10, tell me how you would rate your pain now." Ms. Devine replies, "I would say about a 4; it is still there but not as sharp." Lisa continues, "You said you were feeling less worried." Ms. Devine says, "Yes, I think you have helped me feel less anxious. You know, surgery is nothing anyone wants to have, but I feel better knowing what to expect." Lisa observes that Ms. Devine is relaxed and does not grimace when she turns slightly to her side. Lisa asks, "Can you take just a moment to go over with me what we discussed about your care after surgery?" Ms. Devine responds, "Sure; that would be fine."

Critical Thinking and Evaluation

Evaluation is an ongoing process whenever you have contact with a client. Collaboration is a key component of the evaluation process. You gather subjective data from the client as well as objective data from the family and health care team members prior to and following an intervention; this ensures all facets of the client's health are considered. You also review knowledge regarding the client's current condition, treatment, resources available for recovery, and the expected outcomes. By referring to previous experiences caring for similar clients, you are in a better position to know how to evaluate your client's needs. Apply critical thinking qualities and standards to determine whether expected outcomes of care are achieved (Figure 14-1). If expected outcomes are achieved, the overall goals for the client also are met. Client behaviour and responses that you assessed before performing nursing interventions are compared with behaviour and responses that occur after you perform nursing care. Critical thinking directs you to analyze the findings from evaluation (Figure 14-2): Has the client's condition improved? Is the client able to improve, or do physical factors preventing recovery exist? To what degree does this

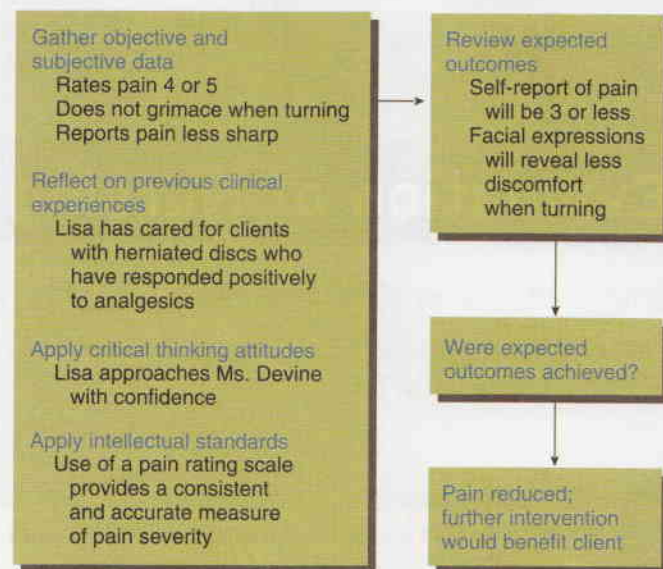


Figure 14-1 Critical thinking and the evaluation process.

client's motivation or willingness to pursue healthier behaviour influence response to therapies?

During evaluation, you make clinical decisions and continually redirect nursing care. For example, when Lisa evaluates Ms. Devine for a change in pain severity, she applies knowledge of the disease process, physiological responses to interventions (e.g., analgesics), and the correct procedure for pain severity measurement to interpret whether a change has occurred and whether the change is desirable. Lisa knows that the condition of the herniated disc will not change as a result of an analgesic, but the opioid medication she administered will alter the client's perception and reaction to pain (see Chapter 41). Use of the pain severity rating scale helps Lisa obtain an accurate measure of change in the client's pain perception. Evaluative findings determine Lisa's next course of action. In Ms. Devine's case, the pain score is a bit higher (4) than expected (3). However, the client is about to leave for surgery. Ms. Devine will probably receive a preoperative medication just before she goes to the preoperative holding area. The preoperative medication will include an analgesic, so Lisa knows she cannot administer an additional analgesic at this time. She evaluates that Ms. Devine's pain has been reduced and decides to continue to use basic comfort measures to afford further pain relief.

Positive evaluations occur when you meet desired outcomes, and they lead you to conclude that the nursing intervention or interventions effectively met the client's goals. For example, in the case study, Lisa notes that Ms. Devine's pain rating fell from an 8 or 9 to a 4. With an expected outcome of a pain severity of 3, Lisa's interventions showed a successful reduction in pain severity, but continuing intervention is necessary. Unmet or undesirable outcomes, such as the continuation of severe pain, indicate that interventions are not effective in minimizing or resolving the actual problem or avoiding the risk of a problem. Outcomes need to be realistic and adjusted on the basis of the client's prognosis and nursing diagnoses. An unmet outcome reveals the client has not responded to interventions as planned. As a result, you change the plan of care by trying different therapies or changing the frequency or

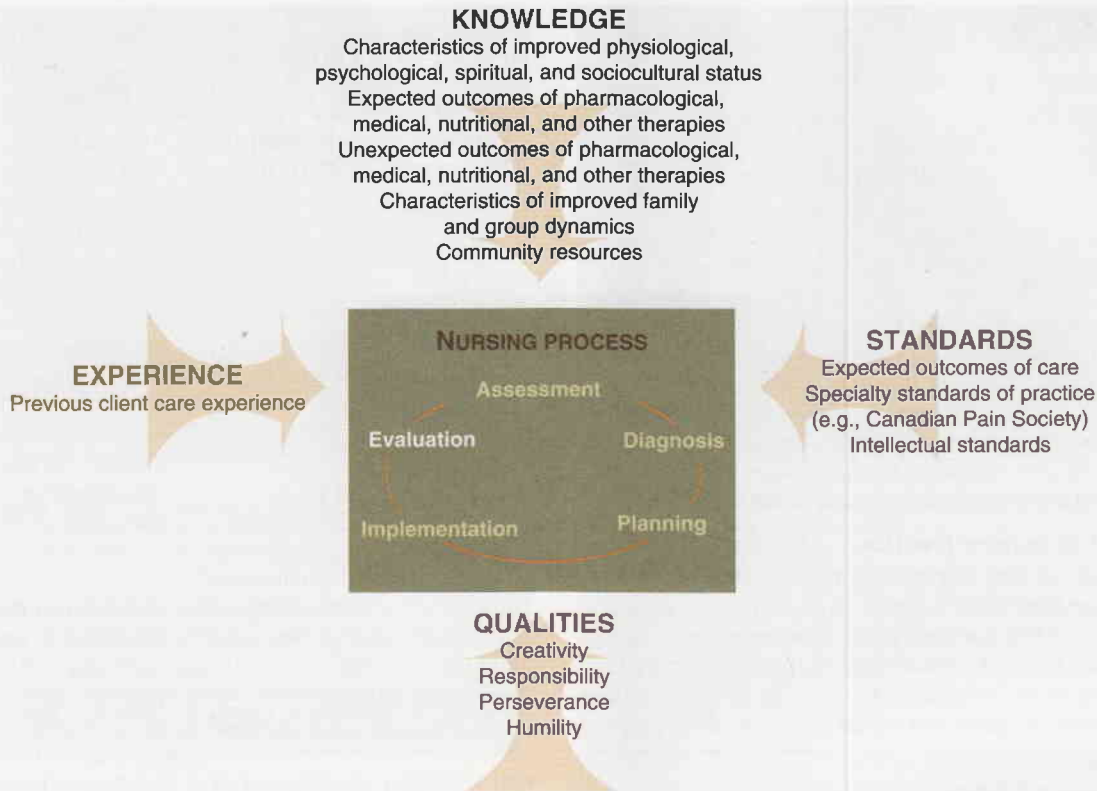


Figure 14-2 Critical thinking and evaluation.

approach of existing therapies. Reflecting on the success or failure of previous interventions will enhance your clinical expertise when choosing relevant evidence-informed options for future clients.

This sequence of critically evaluating and revising therapies continues until you and the client successfully and appropriately resolve the problems, as defined by nursing diagnoses. Remember that evaluation is dynamic and ever-changing, depending on the client's nursing diagnoses and condition. As problems change, so will expectations of outcomes. A client whose health status continuously changes requires more frequent evaluation. In addition, you will evaluate high-priority diagnoses first. For example, Lisa evaluates Ms. Devine's diagnosis of *acute pain* before evaluating the status of the diagnosis of *deficient knowledge*.

The Evaluation Process

The purpose of nursing care is to assist the client in resolving actual health problems, preventing the occurrence of potential problems, and maintaining a healthy state. The evaluation process, which determines the effectiveness of nursing care, consists of five elements: (1) identifying evaluative criteria and standards; (2) collecting data to determine whether the criteria or standards are met; (3) interpreting and summarizing findings; (4) documenting findings and any clinical judgement; and (5) terminating, continuing, or revising the care plan.

Identifying Criteria and Standards

You evaluate nursing care by critically analyzing the attainment of the client's identified goals and expected outcomes. A

client's goals and expected outcomes are the objective criteria by which to judge a client's response to care.

Goals. A goal is the expected behaviour or response that indicates resolution of a nursing diagnosis or maintenance of a healthy state. It is a summary statement of what will be accomplished when the client has met all expected outcomes. In the case of Ms. Devine, Chapter 13 described Lisa's plan of care for *acute pain*. Lisa selected the goal "Client achieves improved pain control before surgery." Successful achievement of this goal depends on the success of Lisa's interventions, chosen from the Nursing Interventions Classification (NIC) (Bulechek et al., 2008), for analgesic administration, pain management, and progressive muscle relaxation. Goals are also often based on standards of care or guidelines established for minimal safe practice. When a nurse cares for a client with a peripheral intravenous line, the goal "The intravenous site will remain free of phlebitis" is established on the basis of sound practice standards. (The Registered Nurses' Association of Ontario's [2012] *Best Practice Guidelines* contains specific recommendations for care and maintenance to reduce vascular access complications.)

Expected Outcomes. Outcomes have been broadly defined in the health care literature. Lewis et al. (2010) describe outcomes as merely the end product of health care. When nurses apply the nursing process, expected outcomes are the expected favourable and measurable results of nursing care. A nursing-sensitive client outcome is a measurable client or family state, behaviour, or perception largely influenced by and sensitive to nursing interventions (Moorhead et al., 2008). Examples of nursing-sensitive outcomes are reductions in pain severity, in incidence of pressure ulcers, in nosocomial

BOX 14-1 RESEARCH HIGHLIGHT

Nursing-Sensitive Outcomes

Evidence Summary

Nurses make significant contributions to the health care system, yet the powerful influence and impact of nurses remain virtually unknown. The College of Registered Nurses of Nova Scotia (CRNNS) recognizes the power of using evidence to influence health policy at provincial and national levels. The CRNNS is amassing a document that highlights recent nursing research and evidence related to (a) nurse staffing and client safety, (b) clinical outcomes research, and (c) studies examining the effects of nursing education and client outcomes (CRNNS, 2010). The discourse on nurse-sensitive outcomes highlights independent nursing functions that directly affect client outcomes. It is a valuable resource available to key stakeholders highlighting the contributions of registered nurses and nurse practitioners.

Application to Nursing Practice

An established database highlighting research related to nurse-sensitive outcomes will assist in the

- Development of best practices in client treatment plans
- Establishment of quality indicators of care
- Decision making related to staffing
- Planning of new programs and services

Reference: College of Registered Nurses of Nova Scotia. (2010, Revised). *Registered nurse-sensitive outcomes: A summary report*. Halifax: Author. Retrieved from http://www.crnns.ca/documents/FINAL_Report-RN_Sensitive_Outcomes_2010a%20_2_.pdf.

infections (e.g., *Clostridium difficile*) and in incidence of falls (Box 14-1). In comparison, outcomes influenced largely by medical interventions include client mortality, hospital readmissions, and length of stay. **Outcomes** are statements of progressive, step-by-step responses or behaviours that must be achieved in order to accomplish the goals of care. An outcome defines the effectiveness, efficiency, and measurement of the results of nursing interventions. When you achieve outcomes, the related factors for a nursing diagnosis usually no longer exist. In Ms. Devine's case, the expected outcomes for the goal of achieving improved pain control are "Client's self-report of pain will be 3 or less on a scale of 0 to 10" and "Client's facial expressions reveal less discomfort when turning and repositioning." When Lisa evaluates Ms. Devine's pain at a level of 4 and notes an absence of facial grimacing during turning, she knows the client's pain has been reduced but that further pain relief is needed. However, the related factor for Ms. Devine's diagnosis of *acute pain* is pressure on spinal nerves, which will not be totally relieved until surgery. The analgesics and non-invasive nursing interventions are designed to reduce the perception of pain from pressure on the nerves, as well as to minimize additional pressure on nerves. It is important to understand that evaluation is not a description of the achievement of an intervention. Evaluation of Ms. Devine does *not* involve observation of her ability to turn correctly; it *does* involve observation of the client's behaviour (facial expression) during turning. During the planning phase of the nursing process (see Chapter 13), it is important for you to select an observable client state, behaviour, or self-reported perception that will reflect goal achievement.

One valuable resource is the Nursing Outcomes Classification (NOC) (Moorhead et al., 2008), which provides a

TABLE 14-1

Linkages Between Nursing Outcomes Classification and Nursing Diagnoses

Nursing Diagnosis	Suggested Outcomes	Indicators (Examples)
Pain	Comfort level	Reported physical well-being Reported satisfaction with symptom control Expressed satisfaction with pain control
	Pain control	Recognition of pain onset Appropriate use of analgesics Control of reported pain
	Pain level	Reported pain severity Frequency of pain Muscle tension
Deficient knowledge	Knowledge: treatment procedures	Description of treatment procedures
	Knowledge: illness care	Description of disease process Description of prescribed activity

Adapted from Moorhead, S., Johnson, M., Maas, M., & Swanson, E. (2008). *Nursing outcomes classification (NOC)* (4th ed.). St. Louis, MO: Mosby.

classification system of nursing sensitive outcomes. NOC is designed to provide the language for the evaluation step of the nursing process. The purposes of NOC are (1) to identify, label, validate, and classify nursing-sensitive client outcomes; (2) to field test and validate the classification; and (3) to define and test measurement procedures for the outcomes and indicators using clinical data. The NOC project complements the work of NANDA International (2009) and the NIC project. The NOC system offers nursing-sensitive outcomes for NANDA International nursing diagnoses (Table 14-1). For each outcome, the NOC system specifies recommended evaluation indicators: the client behaviours or responses that are measures of outcome achievement. Nurse-sensitive outcomes have far-reaching benefits and may aid in the development of health policy reflecting best practice and quality indicators of care (College of Registered Nurses of Nova Scotia [CRNNS, 2010]).

Collecting Evaluative Data

Proper evaluation enables you to determine the client's response to nursing care and whether the therapy was effective in improving the client's physical or emotional health. It is important to evaluate whether each client reaches a level of wellness or recovery that the health care team and client established in the goals of care. In addition, you must determine whether you met the client's expectations of care. You will ask clients questions about their perceptions of care, such as "Did you receive the type of pain relief you expected?" and "Did you receive enough information to care for your baby at home?" This level of evaluation is important for determining the client's satisfaction with care and for strengthening the partnering between you and the client. Always select appropriate evaluative measures to evaluate client response and expectations. Evaluating a client's response to nursing care requires the use of **evaluative measures**, which are simply

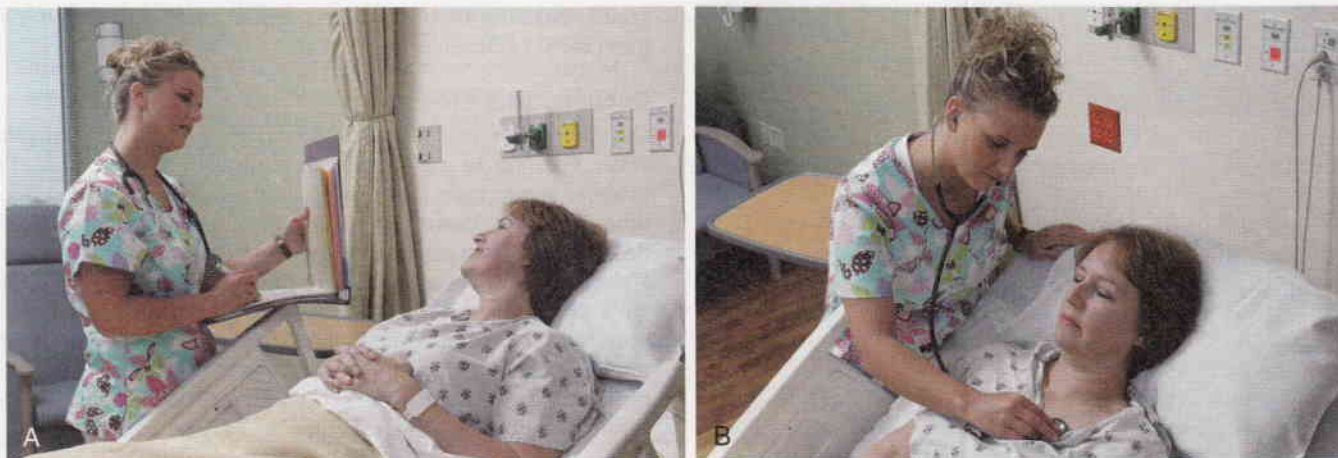


Figure 14-3 Evaluative measures. **A**, Nurse confirms client's medical history. **B**, Nurse evaluates client's lung sounds.

assessment skills and techniques (e.g., auscultation of lung sounds, observation of a client's skill performance, discussion of the client's feelings, and inspection of the skin) (Figure 14-3). In fact, evaluative measures are the same as assessment measures, but you perform them when you make decisions about the client's status and progress.

The intent of assessment is to identify any problems that exist. The intent of evaluation is to determine whether the known problems have remained the same, improved, worsened, or otherwise changed. In many clinical situations, it is important to collect evaluative measures over a period of time to determine whether a pattern of improvement or change exists. A one-time observation of a pressure ulcer is insufficient to determine that the ulcer is healing. It is important to note a consistency in change. For example, over a period of two days, you can observe whether the pressure ulcer is gradually decreasing in size, whether the amount of drainage is declining, and whether the redness of inflammation is resolving. Recognizing a pattern of improvement or deterioration allows you to reason and decide whether the client's problems are resolved. The primary source of data for evaluation is the client. However, you also use input from the family and other caregivers. For example, if a client is at home, you can ask a family member to report on the amount of food the client eats during a meal or how well a client prepares to take medications. You will sometimes consult with a colleague about how a hospitalized client responded to pain medication during another shift.

Interpreting and Summarizing Findings

During an acute illness, a client's clinical condition changes, often minute by minute. In contrast, chronic illness results in slow, subtle changes. When you evaluate the effect of interventions, you learn to recognize relevant evidence about a client's condition, even evidence that sometimes does not match clinical expectations. By applying your clinical knowledge and experience, you learn to recognize complications or adverse responses to illness and treatment in addition to expected outcomes. Using evidence, you make judgements about a client's condition. To develop clinical judgement, you learn to match the results of evaluative measures with expected outcomes to determine whether a client's status is improving. When interpreting findings, you compare the client's behavioural

responses and the physiological signs and symptoms you expect to observe with those you actually observe in your evaluation. Comparing expected and actual findings allows you to interpret and judge the client's condition and whether predicted changes have occurred (Table 14-2).

To objectively evaluate the degree of success in achieving outcomes of care, use the following steps:

1. Examine the outcome criteria to identify the exact desired client behaviour or response.
2. Assess the client's actual behaviour or response.
3. Compare the established outcome criteria with the actual behaviour or response.
4. Judge the degree of agreement between outcome criteria and the actual behaviour or response.
5. If the outcome criteria are not in agreement or are in only partial agreement with the actual behaviour or response, what are the barriers to agreement? Why was agreement not complete?

Evaluation is easier to perform after you care for a client over a long period. You are then able to make subtle comparisons of client responses and behaviours. When you have not had the chance to care for a client over an extended time, you improve evaluation by referring to previous experiences or asking colleagues who are familiar with the client to confirm evaluation findings. In short-term stay settings, a plan of care with clearly defined short- and long-term goals provides a framework to guide future care. The accuracy of any evaluation improves when you are familiar with the client's behaviour and physiological status or have cared for more than one client with a similar problem. Remember to evaluate whether each expected outcome was achieved and its place in the sequence of care. If you do not, it will be difficult to determine which expected outcome in the sequence was not achieved, and you cannot revise and redirect the plan of care at the most appropriate time. If the client achieves the expected outcomes, you either continue the care plan to maintain a therapeutic status or discontinue interventions because the goal of care is met. If evaluation reveals that the expected outcomes were not achieved or were only partially achieved, you begin reassessment and revision of the care plan. Goals are achieved in different degrees. If the client's response matches or exceeds the outcome criteria, the goal is met. If the client's behaviour begins to show changes but does not yet meet criteria set, the

▶ TABLE 14-2

Evaluative Measures to Determine the Success of Goals and Expected Outcomes

Goals	Evaluative Measures	Expected Outcomes
Client's pressure ulcer will heal within seven days	Inspect colour, condition, and location of pressure ulcer Measure diameter of ulcer daily Note odour and colour of drainage from ulcer	Erythema will be reduced in two days Diameter of ulcer will decrease in five days Ulcer will have no drainage in two days Skin overlying ulcer will be closed in seven days
Client will tolerate ambulation to end of hall by 11/20	Palpate client's radial pulse before exercise Palpate client's radial pulse 10 minutes after exercise Assess respiratory rate during exercise Observe client for dyspnea or breathlessness during exercise	Pulse will remain below 110 beats per minute during exercise Respiratory rate will remain within two breaths of client's baseline rate Client will deny feeling of breathlessness
Client will have improved grief resolution by 1/15	Ask client about frequency of periods of crying, sadness Review client's sleeping log Review client's dietary intake	Client reports decreased frequency of crying and sadness in two months Client has periods of six to seven hours of sleep without interruption within 10 days Client has no weight loss in one month

goal is partially met. If progress is not made, the goal is not met (Table 14-3).

Documenting Findings

Documentation and reporting are an important part of evaluation. For you to make ongoing clinical decisions, a client's medical record must contain accurate information. When documenting the client's response to interventions, always describe the same evaluative measures. Your aim is to present a clear description, informed by the evaluative data, of a client's progress or lack of progress. Written nursing progress notes, assessment flow sheets, and information shared between nurses during change-of-shift reports (see Chapter 15) communicate a client's progress toward meeting expected outcomes and goals for the nursing plan of care.

Care Plan Revision

Evaluate expected outcomes, and determine whether the goals of care have been met. Then decide whether you need to adjust the plan of care. If you meet a goal successfully, discontinue that portion of the care plan. If goals are unmet or partially met, you must continue intervention. After you evaluate a client, you may want to modify or add nursing diagnoses with appropriate goals and expected outcomes, and establish interventions. You must also redefine priorities. This is an important step in critical thinking: knowing how the client is progressing and how problems either resolve or worsen.

In the case of Ms. Devine, Lisa's initial evaluation at the beginning of this chapter revealed the following: the client reported feeling better, rated pain at a level of 4, was lying in bed relaxed, felt less worried, and did not grimace when turning over.

When matching these actual behaviours and responses to expected outcomes, Lisa determines that Ms. Devine's pain and anxiety have lessened. Because the pain is less acute, Ms. Devine's mobility is less restricted. However, Lisa knows that the cause of Ms. Devine's pain has not been corrected. The surgery is still pending, and thus the client's anxiety will possibly increase. Lisa decides to continue the plan of care but makes revisions by adding more basic comfort measures. The comfort measures help control both the pain and anxiety and help maintain the client's mobility. Lisa next evaluates whether

▶ TABLE 14-3

Examples of Objective Evaluation of Goal Achievement

Goals	Outcome Criteria	Client Response	Evaluation Findings
Client will self-administer insulin by 12/18	Client prepares insulin dosage in syringe by 12/17 Client demonstrates self-injection by 12/18	Client prepared accurate dosage in syringe on 12/17 Client administered morning insulin dosage and performed self-injection correctly on 12/18	Client has progressed and achieved desired behaviour
Client's lungs will be free of secretions by 11/30	Coughing will be nonproductive by 11/29 Lungs will be clear to auscultation by 11/30 Respirations will be 20 per minute by 11/30	Client coughed frequently and productively on 11/29 Lungs were clear to auscultation on 11/30 Respirations were 18 per minute on 11/29	Client will require continued therapy Condition is improving
Client will be able to perform self-care measures without discomfort in two days	Client will rate pain as 3 on a scale of 0-10 within two days Client will initiate bathing within two days	Client rates severe right-sided abdominal pain as 5 on a scale of 0-10 while attempting bathing on day 2	Client's condition still indicates a problem Client requires continued therapy with possibly new care measures

Ms. Devine remembers the postoperative activities that they discussed earlier: "Ms. Devine, we talked about several things that you will be asked to do after surgery. I want to know whether you understand what we discussed. Tell me what to expect about your pain control and activity." Ms. Devine responds, "You said that I would have a device that lets me control how much pain medication I receive. I should not be afraid to use it. I know the nurses will get me up early to move around. You said if I can get control of the pain, it will be easier to get up and walk. What I do not remember is something you said about breathing." Lisa says, "The pain control device you are referring to is called a PCA. As for breathing, let's practise deep breathing with the incentive spirometer one more time." Lisa recognizes that Ms. Devine has learned about select postoperative activities but requires further instruction on the incentive spirometer. Deficient knowledge now becomes Lisa's priority until Ms. Devine leaves for surgery.

Careful monitoring and early detection of problems are a client's first line of defence. Always make nursing judgements of your observations of what is occurring with a specific client and not merely of what happens to clients in general. Frequently, changes are not obvious. Evaluations are client specific, based on a close familiarity with each client's behaviour, physical status, and reaction to caregivers. Critical thinking skills promote accurate evaluation, which enables appropriate revision of ineffective care plans and discontinuation of therapy that has successfully resolved a problem.

Discontinuing a Care Plan

After you determine that expected outcomes and goals have been met, you confirm this finding with the client when possible. If you and the client agree, then you discontinue that portion of the care plan. Documentation of a discontinued plan ensures that other nurses will not unnecessarily continue interventions for that portion of the plan of care. Continuity of care ensures that care provided to clients is relevant and timely. If you do not communicate achieved goals, you will waste much time.

Modifying a Care Plan

When goals are not met, you identify the factors that interfere with goal achievement. A change in the client's condition, needs, or abilities usually necessitates alteration of the care plan. For example, when teaching self-administration of insulin, you discover that the client has developed a new problem, a tremor associated with a side effect of a medication. The client is unable to draw medication from a syringe or inject the needle safely. As a result, the original outcomes "Client will correctly prepare insulin in a syringe" and "Client will administer insulin injection independently" cannot be met. You introduce new interventions (instructing a family member in insulin preparation and administration or introduce an alternative method of insulin administration, such as an insulin pen) and revise outcomes to meet the goal of care.

At times a lack of goal achievement results from an error in nursing judgement or failure to follow each step of the nursing process. Clients often have multiple and complex problems. When a goal is not achieved, no matter what the reason, repeat the entire nursing process sequence for that nursing diagnosis to discover which changes in the plan are needed. You then reassess the client, determine accuracy of the nursing diagnosis, establish new goals and expected outcomes, and select new interventions while adhering to national and provincial nursing standards.

A complete reassessment of all client factors relating to the nursing diagnosis and etiology is necessary when you modify a plan. Reassessment requires critical thinking as you compare new data about the client's condition with previously assessed information.

Knowledge from previous experiences helps you direct the reassessment process. Caring for clients and families who have had similar health problems gives you a strong background of knowledge to use for anticipating client needs and knowing what to assess. Reassessment reveals "missing links" (i.e., critical pieces of new information that were overlooked, which thus interfered with goal achievement). You sort, validate, and cluster all new data to analyze and interpret differences from the original database. You also document reassessment data to alert other nursing staff to the client's status. After reassessment, determine what nursing diagnoses are accurate for the situation. Ask whether you selected the correct diagnosis and whether it and the etiological factor are current. Then revise the problem list to reflect the client's changed status.

Sometimes you make a new diagnosis. You base your nursing care on an accurate list of nursing diagnoses. Accuracy is more important than the number of diagnoses selected. As the client's condition changes, the diagnoses also change. For example, you identified the nursing diagnosis *deficient knowledge related to inexperience* for a client with newly diagnosed diabetes. The original plan was to instruct the client in how to self-administer insulin. After finding that the client has difficulty self-administering insulin because of a tremor associated with a side effect of a medication, you reassess the situation and find that a family member is available as a resource. To develop a plan designed to educate a caregiver about the administration of insulin, you then establish a new diagnosis: *ineffective health maintenance related to impaired dexterity*.

Goals and Expected Outcomes

When you revise care plans, review the goals and expected outcomes for needed changes. You even need to examine the appropriateness of goals for unchanged nursing diagnoses, because a change in one problem sometimes affects other problems. Determining that each goal and expected outcome is realistic for the problem, etiology, and time frame is particularly important. Unrealistic expected outcomes and time frames hamper goal achievement. Clearly document goals and expected outcomes for new or revised nursing diagnoses so that all team members are aware of the revised care plan. When the goal is still appropriate but has not yet been met, try changing the evaluation data to allow more time. You may also decide at this time to change interventions. For example, when a client's pressure ulcer does not show signs of healing, you choose to use a different support surface or a different type of wound cleanser. All goals and expected outcomes are client-centred, with realistic expectations for client achievement.

Interventions

The evaluation of interventions concerns two factors: the appropriateness of the interventions selected and the correct application of the intervention. The appropriateness of an intervention is based on the standard of care for a client's health problem. A **standard of care** is the minimum level of care acceptable to ensure high quality of care. Standards of care define the types of therapies typically administered to clients with defined problems or needs. If a client who is receiving chemotherapy for leukemia has a specific nursing diagnosis,

such as *nausea related to pharyngeal irritation*, the standard of care established by a nursing department for this problem includes pain control measures for pharyngeal irritation, mouth care guidelines, and diet therapy. The nurse reviews the standard of care to determine whether the right interventions have been chosen or whether additional ones are required. Increasing or decreasing the frequency of interventions is another approach for ensuring appropriate application of an intervention. You adjust interventions on the basis of the client's actual response to therapy, as well as previous experience with similar clients. For example, if a client continues to have congested lung sounds, you increase the frequency of the client's coughing and deep breathing exercises to remove secretions.

During evaluation, you find that some planned interventions are designed for an inappropriate level of nursing care. If you need to change the level of care, substitute a different action verb, such as *assist* in place of *provide* or *demonstrate* in place of *instruct*, in the revised care plan. For example, to assist a client to walk, a nurse must be at the client's side during ambulation, whereas providing an assistive device helps the client ambulate more independently. Also, demonstrating requires you to show a client how a skill is performed rather than simply telling the client how to perform it. Sometimes the level of care is appropriate but the interventions are unsuitable because of a change in the expected outcome. In this case, discontinue the interventions and plan new ones. Make any changes in the plan of care according to the nature of the client's unfavourable response. Consult with other nurses to obtain suggestions for improving the approach to care delivery. Senior nurses are often excellent resources because of their experience. Simply changing the care plan is not enough. Implement the new plan, and re-evaluate the client's response to the nursing actions. *Evaluation is continuous.*

On occasion, you will discover unmet client needs during evaluation. This is normal. The nursing process is a systematic, problem-solving approach to individualized client care, but many factors affect each client with health care problems. Clients with the same health care problem are not treated the same way. As a result, you will sometimes make errors in judgement. The systematic use of evaluation provides a way for you to catch these errors. By consistently incorporating evaluation into practice, you will minimize errors and ensure that the client's plan of care is appropriate and relevant.

The evaluation of nursing care is a professional responsibility, and it is a crucial component of nursing care. Evaluation that focuses on a single client's plan of care enables you as a nurse to know the effectiveness of interventions and whether expected outcomes are met. At a system or institutional level, evaluation involves quality improvement and performance improvement activities that focus on the delivery of care provided by an agency or a specific nursing division within an agency. Through the continuous evaluation of care, nurses play a key role in the ongoing improvement of client care.

❖ KEY CONCEPTS

- Evaluation is a step of the nursing process that allows nurses to determine whether nursing interventions are successful in improving a client's condition or well-being.
- During evaluation, the appropriateness of the intervention should be assessed, as should the outcome.
- Evaluation involves two components: an examination of a condition or situation and a judgement as to whether change has occurred.

- During evaluation, apply critical thinking to make nursing decisions and redirect nursing care to best meet clients' needs.
- Evaluation findings are positive when you meet desired outcomes; this enables you to conclude that your interventions were effective.
- When the client's actual response (e.g., behaviours and physiological signs and symptoms) to nursing interventions are compared with expected outcomes established during planning, you determine whether goals of care are met. At this time, you should also determine whether the goals, outcomes, or both were realistic.
- Evaluative measures are assessment skills or techniques that you use to collect data for evaluation.
- It sometimes becomes necessary to collect evaluative measures over time to determine whether a pattern of change exists.
- To interpret evaluative findings, examine the outcome criteria, assess the client's actual behaviour or response, compare the outcome criteria with the actual behaviour or response, and judge the degree of agreement.
- Documentation of evaluative findings allows all members of the health care team to know whether a client is progressing.
- As a result of evaluation, a client's nursing diagnoses, priorities, and interventions sometimes change.

❖ CRITICAL THINKING EXERCISES

1. Mr. Jacko has recently received a diagnosis of asthma and is to be discharged tomorrow. His physician has ordered a metered dose inhaler for Mr. Jacko to use daily. The client has not used an inhaler before. He asks the nurse, "What do I do at home if I have trouble using this thing?" The nursing diagnosis for Mr. Jacko is *deficient knowledge regarding use of a metered-dose inhaler related to inexperience*. Write a goal and expected outcome for this clinical scenario.
2. Mr. Vicar has been visiting the clinic for more than a month. He visits weekly for follow-up care for a chronic venous stasis ulcer of the left leg. The nurse's note at the time of his first visit contained the following information: "Ulcer with irregular margins, 4 cm wide by 5 cm long, approximately 0.5 cm deep, draining foul-smelling purulent yellowish drainage. Subcutaneous tissue visible. Skin around ulcer, brownish rust in colour. Zinc oxide and calamine gauze applied to ulcer; elastic wrap bandage applied to gauze. Client instructed to return in 1 week." The stated goal is "Wound will demonstrate healing within 4 weeks." As the nurse who is caring for the client on the follow-up visit, what expected outcomes would you anticipate for this goal? What evaluative measures would you use to determine whether the wound is healing?

❖ REVIEW QUESTIONS

1. A nurse caring for a client with pneumonia sits the client up in bed and suctions the client's airway. After suctioning, the client describes some discomfort in his abdomen. The nurse auscultates the client's lung sounds and provides a glass of water for the client. Which of the following is an evaluative measure used by the nurse?
 1. Suctioning the airway
 2. Sitting client up in bed
 3. Auscultating lung sounds
 4. Asking client to describe type of discomfort

2. A nurse caring for a client with pneumonia sits the client up in bed and suctions the client's airway. After the suctioning, the client describes some discomfort in his abdomen. The nurse auscultates the client's lung sounds and provides a glass of water to the client. Which of the following is an appropriate evaluative criterion used by the nurse? (*Choose all that apply.*)
 1. The client drinks the contents of the water glass.
 2. The client's lungs are clear to auscultation in bases.
 3. The client reports abdominal pain on scale of 0 to 10.
 4. The client's rate and depth of breathing are normal with the head of the bed elevated.

3. The evaluation of nursing care is a professional responsibility and crucial to determining whether, after application of the nursing process, the client's condition or well-being improves. One of the five elements of the evaluation process is "identifying evaluative criteria and standards." On what objective criteria does the nurse base judgement of a client's response to care?
 1. Goals and expected outcomes
 2. Client states "I am feeling better."
 3. Nursing diagnosis
 4. Effective communication by the client

4. Mr. Gunderson returns to the walk-in clinic after taking a seven-day course of antibiotic therapy and is still exhibiting signs of pneumonia. What should be the nurse's initial action?
 1. Arrange for the physician to order a different antibiotic.
 2. Obtain another sputum specimen for a culture and sensitivity.
 3. Determine if Mr. Gunderson took the medication as prescribed.
 4. Make an appointment for Mr. Gunderson to be seen by the physician.

5. When Mr. Gould, a First Nations person, was admitted to hospital he was provided with a regular diet consisting of three traditional meals a day. After a week it was identified that Mr. Gould was eating only 40% of the meals and was losing weight. What should the nurse do?
 1. Request Mr. Gould's family assist with the meals until meals are completed
 2. Schedule several between meal supplements
 3. Change the plan of care to provide five small meals reflecting Mr. Gould's cultural preferences
 4. Secure an order to increase the number of calories provided

❖ RECOMMENDED WEB SITES

Canadian Nurses Association (CNA): http://www2.cna-aiic.ca/CNA/practice/standards/default_e.aspx

This expansive nursing Web site provides comprehensive information regarding many nursing issues such as nursing care delivery models and standards and best practices. The CNA's *Code of Ethics for Registered Nurses* is an example of the type of documents available on this site.

Center for Nursing Classification & Clinical Effectiveness: http://www.nursing.uiowa.edu/excellence/nursing_knowledge/clinical_effectiveness/index.htm

The University of Iowa's Center for Nursing Classification & Clinical Effectiveness was established to facilitate ongoing research of the Nursing Interventions Classification (NIC) and Nursing Outcomes Classification (NOC). This Web site provides an overview of the NIC and NOC and offers information about new classification material and publications.

NANDA International: <http://www.nanda.org/>

Through this Web site, NANDA International provides current information on nursing diagnosis research, publications, support resources, and Internet resources.

Registered Nurses' Association of Ontario: Nursing Best Practice Guidelines: <http://www.rnao.org>

The Registered Nurses' Association of Ontario has developed an extensive process for developing best practices guidelines in a variety of areas of clinical nursing. They have received federal and provincial funding for this process, and the results of their work have been made available to all Canadian nurses through this Web site, which lists all current guidelines that have been developed.

College of Registered Nurses of Nova Scotia (CRNNS): Registered Nurse-Sensitive Outcomes: <http://www.crnns.ca/>

The College of Registered Nurses of Nova Scotia establishes and maintains the standards for nursing practice that registered nurses must meet to ensure the safe and ethical delivery of competent nursing care. The CRNNS Web site provides a plethora of resources for members designed to help them maintain a high level of excellence in practice.

Review Question Answers

1. 3; 2. 2, 4; 3. 1; 4. 3; 5. 3

Rationales for the Review Questions appear at the end of the book.

Documenting and Reporting

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objectives

Mastery of content in this chapter will enable you to:

- Define the key terms listed.
- Describe multidisciplinary communication within the health care team.
- Identify purposes of a health care record.
- Discuss legal guidelines for documentation.
- Identify ways to maintain confidentiality of records and reports.
- Describe six quality guidelines for documentation and reporting.
- Describe the different methods used in record keeping.
- Discuss the advantages of standardized documentation forms.
- Identify elements to include when documenting a patient discharge plan.
- Describe the role of critical pathways in multidisciplinary documentation.
- Identify the important aspects of home care and long-term care documentation.
- Discuss the role of computerized charting and use of electronic health records in documentation.
- Describe the purpose and content of a change-of-shift report.
- Explain how to verify telephone orders.

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- Audio Chapter Summaries
- Examination Review Questions
- Glossary
- Weblinks

key terms

Acuity records, p. 219
 Care maps, p. 213
 Case management, p. 210
 Change-of-shift report, p. 223
 Charting by exception (CBE), p. 210
 Clinical decision support, p. 223
 Computerized physician order entry (CPOE), p. 223
 Consultations, p. 204
 Critical pathways, p. 213
 Data-action-response (DAR) notes, p. 209
 Documentation, p. 202
 Electronic health record (EHR), p. 223
 Flow sheets, p. 213
 Focus charting, p. 209
 Incident reports, p. 225
 Identification-situation-background-assessment-recommendation-read back (I-SBAR-R) technique, p. 223
 Kardex, p. 213
 Personal digital assistants (PDAs), p. 220
 Personal Information Protection and

Electronic Documents Act (PIPEDA), p. 203
 Point-of-care information systems, p. 222
 Problem-intervention-evaluation (PIE), p. 209
 Problem-oriented medical record, p. 208
 Record, p. 203
 Referrals, p. 204
 Reports, p. 203
 Residents, p. 220
 Situation-background-assessment-recommendation (SBAR) technique, p. 223
 Source record, p. 209
 Standardized care plans, p. 219
 Subjective-objective-assessment-plan (SOAP), p. 209
 Subjective-objective-assessment-plan-intervention-evaluation (SOAPIE), p. 209
 Transfer reports, p. 225
 Transfer of accountability (TOA), p. 223
 Variances, p. 213
 Workload measurement systems, p. 219

Documentation is anything written or electronically generated that describes the status of a patient or the care or service given to that patient. Documentation within a patient health care record is a vital aspect of nursing practice. According to Hendrich et al. (2008), more than 35% of nursing practice time is concerned with documentation. Nursing documentation must be accurate, comprehensive, and flexible enough for members of the health care team to retrieve critical data,

maintain continuity of care, and track patient outcomes, and it must reflect current standards of nursing practice. Information in the patient record provides a detailed account of the quality of care delivered to patients. Documentation ensures continuity and quality of care, furnishes legal evidence of care, provides evidence for quality assurance purposes, and constitutes a database for planning future health care (Cheevakasemsook et al., 2006).

Effective documentation can positively affect the quality of life and health outcomes for patients and minimize the risk of errors. Accrediting agencies such as Accreditation Canada offer guidelines for documentation. However, documentation and reporting practices differ among institutions and jurisdictions and are influenced by ethical, legal, medical, and agency guidelines.

As a member of the health care team, you need to communicate information about patients accurately and in a timely, effective manner. The quality of patient care depends largely on the caregivers' ability to communicate with one another. All health care providers require accurate information about patients in order to devise an organized, comprehensive care plan. If the care plan is not communicated to all members of the health care team, care can be fragmented, tasks repeated, and therapies delayed or omitted. Data recorded, reported, or communicated to other health care providers are confidential, and the confidentiality of these data must be protected.

The health care environment creates many challenges to accurately documenting and reporting patient care. Because of the quality of care, the standards of regulatory agencies and nursing practice, and the legal guidelines for nursing practice, documentation and reporting are critical responsibilities of a nurse.

Confidentiality

Whether the transfer of patient information occurs through verbal reports, written documents, or electronic transfer, nurses must follow certain principles to maintain confidentiality of information. You are legally and ethically obligated to keep information about patients confidential. You may not discuss a patient's examination, observation, conversation, or treatment with other patients or with staff who are not involved in the patient's care. Only staff directly involved in a specific patient's care have legitimate access to the records. Many patients request copies of their health records, and they have the right to read their records. Each institution has policies for controlling the manner in which records are shared. In most situations, institutions are required to obtain written permission from patients to release medical information.

As a nurse, you are also responsible for protecting records from all unauthorized readers. When nurses and other health care providers have a legitimate reason to use records for data gathering, research, or continuing education, they must obtain appropriate authorization according to agency policy. Nursing students and faculty may be required to present identification indicating they are authorized to access records. The health care agency stores the records after the treatment ends.

Before the beginning of clinical placements, students and instructors may be required to sign confidentiality agreements with the agencies in question. Students need to understand the practice standards and laws concerning confidentiality. A breach of confidentiality is often a careless rather than a deliberate act. Students need to make sure that patient-identifiable

information (e.g., files, stickers, information in notebooks, worksheets) is not taken home and is disposed of correctly in a secure bin for shredding. Examples of breaches of confidentiality are accessing information not related to your duties, discussing patient information in an inappropriate area such as an elevator or on public transport, revealing to a caller confidential patient or co-worker details, e-mailing patient information through a public network such as the Internet, and leaving confidential material in a public area. Even after you are no longer on placement at an agency, you are obligated to maintain the confidentiality of patients and co-workers at that agency.

Personal Information Protection and Electronic Documents Act

The *Personal Information Protection and Electronic Documents Act* (PIPEDA) is federal legislation that protects personal information, including health information. PIPEDA delineates how private-sector organizations may collect, use, or disclose personal information in the course of commercial activities. Individuals have the right to access and request correction of any personal information collected about them as well. PIPEDA applies to all organizations engaged in commercial activities unless the federal government exempts an organization or activity in a province with similar legislation. PIPEDA is discussed in more detail in Chapter 16.

Multidisciplinary Communication Within the Health Care Team

Patient care requires effective communication among members of the health care team. Communication takes place through the patient's record or chart and reports.

A patient's **record**, or chart, is a confidential, permanent legal document of information relevant to a patient's health care. Information about the patient's health care is recorded after each contact with the patient. The record is a continuing account of the patient's health care status and is available to all members of the health care team. All health records contain the following information:

- Patient identification and demographic data
- Informed consent for treatment and procedures
- Advance directives
- Admission nursing history
- Nursing diagnoses or problems and the nursing or multidisciplinary care plan
- Record of nursing care treatment and evaluation
- Medical history
- Medical diagnosis
- Therapeutic orders
- Progress notes for various health care providers
- Reports of physical examinations
- Reports of diagnostic studies
- Record of patient and family education
- Summary of operative procedures
- Discharge plan and summary

Reports are oral, written, or audiotaped exchanges of information between caregivers. Reports commonly compiled by nurses include change-of-shift reports, telephone reports, transfer reports, and incident reports (see "Reporting" later in this chapter). A physician or nurse practitioner may call a nursing unit to receive a verbal report on a patient's condition



Figure 15-1 Staff communicate information about their patients during a change-of-shift report.

and progress. A laboratory submits a written report about the results of diagnostic tests.

Team members communicate information through discussions or conferences (Figure 15-1). For example, a discharge planning conference often involves members of several disciplines (e.g., nursing, social work, dietary, medicine, and physiotherapy), who meet to discuss the patient's progress toward established discharge goals. **Consultations** are another form of discussion whereby one professional caregiver gives formal advice about the care of a patient to another caregiver. For example, a nurse caring for a patient with a chronic wound may need a consultation with a wound care specialist. **Referrals** (an arrangement for services by another care provider), consultations, and conferences must be documented in a patient's permanent record so that all caregivers can plan care accordingly.

Purposes of Records

A record is a valuable source of data that is used by all members of the health care team. Its purposes include communication and care planning, legal documentation, education, funding and resource management, research, and auditing-monitoring.

Communication and Care Planning

The record is a means by which health care team members communicate patient needs and progress, individual therapies, content of conferences, patient education, and discharge planning. The plan of care needs to be clear to everyone reading the chart. The record should be the most current and accurate source of information about a patient's health care status.

In the record, always communicate the manner in which you conduct the nursing process with a patient. The admitting nursing history and physical assessment are comprehensive and provide baseline data about the patient's health status on admission to the facility. These data usually include biographical information (e.g., age and marital status), method of admission, reason for admission, a brief medical-surgical history (e.g., previous surgeries or illnesses), allergies, current medication (prescribed and over-the-counter), the patient's

perceptions about illness or hospitalization, and a review of health risk factors. Results of a physical assessment of all body systems are either documented in the nursing history or included on a separate form (see Chapter 31).

The medical progress notes should complement nursing process information. The notes detail the physician's or nurse practitioner's findings at the time of assessment. Nurses first refer to the patient's health care record for relevant assessment findings so that they can anticipate the patient's status and then conduct an individualized patient assessment.

The record provides data that you use to identify and support nursing diagnoses, establish expected outcomes of care, and plan and evaluate interventions. Information from the record adds to your observations and assessment. You do not need to collect information that is already available. If you have reason to believe that the information is inaccurate, information should be verified and appropriate changes made to the patient's record.

Legal Documentation

Accurate documentation is one of the best defences against legal claims associated with nursing care (see Chapter 8). From a legal perspective, the purpose of documentation is "always to accurately and completely record the care given to patients, as well as their response to that care" (Monarch, 2007, p. 58). According to Cartwright-Vanzant (2010, p. 134), the medical record is vital evidence in negligent practice lawsuits and considered as important as the testimony of witnesses in the courtroom. To limit nursing liability, you must clearly document that individualized, goal-directed nursing care, based on the nursing assessment, was provided to a patient and that you continue to monitor for, document, and report deterioration (Austin, 2008). The record must describe exactly what happened to a patient. Charting should be performed immediately after care is provided. Nursing care may have been excellent, but in a court of law, care not documented is care not provided (Graves Ferrell, 2007). When the chart is reviewed in court, it must show that the patient received "the best, most appropriate care possible" (Duclos-Miller, 2007). In the health care record, you need to indicate all assessments, interventions, patient responses, instructions, and referrals. It is important to complete all documentation on appropriate forms and to be sure that patient-identifying information (patient's name and identification number) is on every page of documentation.

The Nurses Service Organization (2011) (a medical malpractice, professional liability, and risk management company) identified eight common charting mistakes that can result in malpractice: (1) failing to record pertinent health or drug information, (2) failing to record nursing actions, (3) failing to record the administration of medications, (4) recording on the wrong chart, (5) failing to document a discontinued medication, (6) failing to record drug reactions or changes in the patient's condition, (7) transcribing orders improperly or transcribing improper orders, and (8) writing illegible or incomplete orders. Table 15-1 provides guidelines for legally sound documentation.

Education

A patient's record contains a variety of information, including diagnoses, signs and symptoms of disease, successful and unsuccessful therapies, diagnostic findings, and patient behaviours. By reading the patient care record, you can learn the nature of an illness and the patient's response to the illness.

TABLE 15-1 Legal Guidelines for Recording

Guidelines	Rationale	Correct Action
Do not erase, apply correction fluid to, or scratch out errors made while recording.	Charting becomes illegible: It may appear as if you were attempting to hide information or deface record.	Draw single line through error; write "error," "mistaken entry," "delete," or "void" above it; and sign your name or initials and date. Then record note correctly.
Do not write retaliatory or critical comments about patient or care by other health care providers.	Subjective statements can be used as evidence of nonprofessional behaviour or of poor quality of care.	Enter only objective descriptions of patient's behaviour; direct quotes from patient are preferred.
Correct all errors promptly.	Errors in recording can lead to errors in treatment or may imply an attempt to mislead or hide evidence.	Avoid rushing to complete charting; be sure that information is accurate.
Record all facts.	Record must be accurate, factual, and objective.	Be certain entry is factual and thorough; do not speculate or guess. A person reading the documentation should be able to determine that the patient was adequately cared for.
Chart as close as prudently possible to the time of the event.	This is the only accurate method of recalling details. Details can be lost and discrepancies can arise the longer the wait to the documentation of the event.	Document as soon after the event as possible to ensure accuracy.
Do not leave blank spaces in nurse's notes.	Another person can add incorrect information in spaces.	Chart consecutively, line by line; if space is left, draw line horizontally through it and sign your name at end.
Record all entries legibly and in black ink. Do not use felt-tip pens or erasable ink.	Illegible entries can be misinterpreted, thereby causing errors and lawsuits; felt-tip pen ink smudges or runs when wet and may destroy documentation; erasures are not permitted in patient charting. Black ink is more legible when records are photocopied or scanned.	Chart legibly in black ink; avoid the use of erasers, correction fluid, and pencils for documentation.
If an order is questioned, record that clarification was sought.	If you perform an order known to be incorrect, you are just as liable for prosecution as the prescriber is.	Do not record, "physician made error"; instead, chart that "Dr. Wong was called to clarify order for analgesic." Include the date and time of phone call, whom you spoke with, and the outcome.
Chart only your own actions.	You are accountable for information you enter into chart.	Never chart for someone else, except for the following situation: If caregiver has left unit for the day and calls with information that needs to be documented, include the date and time of entry, and reference the specific date and time you are referring to and the name of source of information in the entry, and include that the information was provided by telephone.
Avoid using generalized, empty phrases such as "status unchanged" or "had good day."	Such information is too generalized and has no meaning. Specific information about patient's condition is missing.	Use complete, concise descriptions of care so that documentation is objective and factual.
Begin each entry with the date and time, and end with your signature and title.	This guideline ensures that correct sequence of events is recorded; signature indicates who is accountable for care delivered.	Do not wait until end of shift to record important changes that occurred several hours earlier; be sure to sign each entry (e.g., Mei Lin, RN).
Avoid "precharting" (documenting an entry before performing a treatment or an assessment or before giving a medication).	Precharting invites error and thus endangers the health and safety of the patient; it is also illegal and can constitute falsification of health care records.	Document during or immediately after giving care or after administering a medication.
For computer documentation, keep your password to yourself.	This maintains security and confidentiality.	Once logged on to the computer, do not leave the computer screen unattended. Make sure the computer screen is not accessible for public viewing.

No two patients have identical records, but patterns of information can be identified in records of patients with similar health problems. With this information, you can identify patterns for various health problems and begin to anticipate the type of care required for a patient.

Funding and Resource Management

The patient care record shows how health care agencies have used their financial resources. Various tools help monitor the timing and reasons for health team–patient interactions. These data are then compared with documented entries on the chart to demonstrate the need for and efficacy of health care resources. In some workload assignment systems, health care interactions and tasks are assigned specified points in relation to time spent with each patient.

Research

Statistical data relating to the frequency of clinical disorders, complications, use of specific medical and nursing therapies, recovery from illness, and deaths can be gathered from patient records. For example, as part of a quality improvement program for patients receiving intravenous therapy, a nurse manager reviews patients' records to investigate the incidence of infection in patients with a specific type of intravenous catheter. This review reveals that the infection rate is increased, and the nurse manager and staff nurses design a new method for intravenous catheter care. Once this new intervention is implemented, the manager again reviews patients' records to determine whether the infection rate decreases.

A nurse may use patients' records during a clinical research study to investigate a new nursing intervention. For example, a nurse wants to compare a new method of pain control with a standard pain protocol, by using two groups of patients. The patient records provide data on the two types of interventions: the new method and the standard pain control. The nurse researcher collects data from the patients' records that describe the types and doses of analgesic medications used, objective assessment data, and patients' subjective reports of pain relief. The researcher then compares the findings to determine whether the new method was more effective.

Some data collection activities may be part of the quality improvement practices at an agency, whereas other activities may be actual clinical research studies. Different types of permission must be secured before a researcher can review patient records for any type of research study or data analysis. The researcher must be sure that the data collection and analysis adhere to provincial, territorial, and agency policies.

Auditing-Monitoring

A regular review of information in patient records helps you evaluate the quality and appropriateness of care. This audit may be either a review of care received by discharged patients or an evaluation of care currently being given. Most Canadian health care agencies have continuous quality improvement programs and teams to monitor and improve the delivery of health care services. These teams often contain members from across the organization, and they normally perform the self-assessment requirements of Accreditation Canada (see Chapter 10). Nurses or cross-discipline members of a committee monitor or review records throughout the year to determine the degree to which quality improvement standards are met. Deficiencies are explained to the nursing staff so that corrections in policy or practice can be made.

Guidelines for Quality Documentation and Reporting

High-quality documentation and reporting enhance efficient, individualized patient care and have the potential to improve patient outcomes. According to Jeffries et al. (2010), nursing documentation too often consists of a list of tasks performed, and the production of quality documentation can be a challenge for nurses. High-quality documentation and reporting have six important characteristics: they are factual, accurate, complete, current, and organized, and they comply with standards set by Accreditation Canada and by provincial or territorial regulatory bodies.

Factual

A factual record contains descriptive, objective information about what a nurse sees, hears, feels, and smells. An objective description is the result of direct observation and measurement: for example, "BP 80/50, patient diaphoretic, heart rate 102 and regular. L. Woo, RPN" (where "BP" stands for "blood pressure"). The use of inferences (e.g., "patient appears to be in shock") without supporting factual data is not acceptable because inferences can be misunderstood.

The use of vague terms, such as *appears*, *seems*, or *apparently*, is not acceptable because these words reflect opinion. For example, the description "the patient seems anxious" does not accurately communicate facts and does not inform another caregiver of the details regarding the behaviours exhibited by the patient that led to the use of the word *anxious*. The phrase *seems anxious* is a conclusion without supported facts. Objective documentation includes the observations of the patient's behaviours. For example, objective signs of anxiety can include increased pulse rate, increased respirations, and increased restlessness.

When recording subjective data, document the patient's exact words within quotation marks whenever possible (e.g., "Patient states, 'I feel very nervous and out of control'").

Accurate

The use of exact measurements establishes accuracy. For example, a description such as "Intake, 360 mL of water" is more accurate than "Patient drank an adequate amount of fluid." These measurements can later be used as a means to determine whether a patient's condition has changed. Charting that an abdominal wound is "5 cm in length without redness, drainage, or edema" is more descriptive than "large wound healing well."

Documentation of concise data should be clear and easy to understand. Avoid the use of unnecessary words and irrelevant detail. For example, the fact that the patient is watching TV is relevant only when this activity has relevance to the patient's status and plan of care.

Most health care institutions develop a list of standard abbreviations, symbols, and acronyms to be used by all members of the health care team in documenting or communicating patient care and treatment. Approved abbreviations and acronyms vary, depending on the type of facility (i.e., long-term versus acute care facility). Use of an institution's accepted abbreviations, symbols, and system of measures (e.g., metric) ensures that all staff members use the same language in their reports and records. Always use abbreviations carefully to avoid misinterpretation. For example, "od" (every day) can be misinterpreted to mean "O.D." (right eye). If

► **TABLE 15-2** Examples of Criteria for Reporting and Recording

Topic	Criteria to Report or Record
Assessment	
Subjective data	Description of episode in quotation marks; for example, "I feel as if I have an elephant sitting on my chest, and I can't catch my breath." Onset, location, description of condition (severity, duration, frequency; precipitating, aggravating, and relieving factors); for example, "The pain in my left knee started last week after I knelt on the ground. Every time I bend my knee, I have a shooting pain on the inside of my knee."
Patient behaviour (e.g., anxiety, confusion, hostility)	Onset, behaviours exhibited, precipitating factors, patient's verbal response; for example, "Patient observed pacing in her room, avoiding eye contact with nurse, and repeatedly stating, 'I have to go home now.'"
Objective data (e.g., rash, tenderness, breath sounds)	Onset, location, description of condition (see "Subjective data" above); for example, "1100 hrs: 2 cm raised pale red area noted on back of left hand."
Nursing Interventions and Evaluation	
Treatments (e.g., enema, bath, dressing change)	Time administered, equipment used (if appropriate), patient's response (objective and subjective changes) in comparison with previous treatment; for example, "Patient denied pain during abdominal dressing change" or "Patient reported severe abdominal cramping during enema."
Medication administration	Immediately after administration, document time when medication is given, preliminary assessment (e.g., pain level, vital signs), patient response or effect of medication; for example, "1500: Patient reports a 'throbbing headache all over her head.' Rates pain as 6 (scale 0–10). Tylenol 650 mg given PO. 1530: Patient reports pain level 2 (scale 0–10) and states 'the throbbing has stopped.'"
Patient teaching	Information presented, method of instruction (e.g., discussion, demonstration, videotape, booklet), and patient response, including questions and evidence of understanding such as demonstration of correct self-care or change in behaviour.
Discharge planning	Measurable patient goals or expected outcomes, progress toward goals, need for referrals.

abbreviations are confusing, then to minimize errors, you should spell them out in their entirety.

The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) published a minimum list of dangerous abbreviations that should no longer be used in written medical documentation. Suggestions include writing "unit" instead of "U"; always using a zero before a decimal point in a decimal fraction (e.g., "0.25 mg"); and not writing a zero alone after a decimal point (e.g., writing "5 mg," not "5.0 mg"). The Institute for Safe Medication Practices (2010) published a more extensive list of error-prone abbreviations, symbols, and dose designations that health care institutions also need to consider adding to their "Do Not Use" lists (see Chapter 33).

Correct spelling demonstrates a level of competency and attention to detail. Many terms can easily be misinterpreted (e.g., *dysphagia* and *dysphasia*). Some spelling errors can also result in serious treatment errors; for example, the names of certain medications, such as *digitoxin* and *digoxin* or *morphine* and *hydromorphone*, are similar and must be transcribed carefully to ensure that the patient receives the correct medication.

Record entries must be dated, and a method for identifying the authors of entries must be in place. Therefore, each entry in a patient's record ends with the caregiver's full name or initials and status, such as "Holly Lee, RPN." Each time initials are used, the full name and status must previously appear on the same page so that the individual entering initials can be readily identified. A nursing student enters full name, student nurse abbreviation (e.g., "SN" or "NS"), and educational institution: for example, "Henri Gauthier, SN 1 [student nurse, year one], U of S [University of Saskatchewan]."

Records must reflect accountability during the time frame of the entry. Accountability is best accomplished when you chart only your own observations and actions. Your signature holds you accountable for information recorded. If information was inadvertently omitted from the record, it is acceptable for you to ask colleagues to chart information on your behalf after you leave work. The entry needs to clearly show what was done and by whom (e.g., "At 1100 hrs, Sam Roustas, RN, called and reported that at 0800 hrs, morphine sulphate, 5 mg subcutaneous, was administered to patient for abdominal pain. F. Khan, R.N.").

You should refer to agency policy before making late entries, correcting errors, or completing an omission. Late entries are often documented by writing the current date and time in the next available space as close to the late entry as possible and writing "late entry for [date and shift]." For adding information to an existing entry, using the current date and time in the next space and adding "addendum to note of [date and time of prior note]" is a good practice.

Complete

The information within a recorded entry or a report must be complete, containing appropriate and essential information. Criteria for thorough communication exist for certain health problems or nursing activities (Table 15-2). It is important to document all nursing interventions, such as education and psychosocial support, as this information and the outcomes of these interventions are not often recorded in nursing documentation (Jeffries et al., 2010). An example of a thorough nurse's note is as follows:

"1915: Patient verbalizes sharp, throbbing pain localized along lateral side of right ankle, beginning approximately 15 minutes after twisting

his foot on the stairs at 1700. Patient rates pain as 8 on a scale of 0–10. Pain increased with movement, slightly relieved with elevation. Pedal pulses equal bilaterally. Right ankle circumference 2 cm larger than left. Capillary refill less than 3 seconds bilaterally. Right foot: warm to touch and pale pink, skin intact. Patient able to move toes and respond to tactile stimulation on right foot. Ice applied. Percocet 2 tabs (PO) given for pain. Patient states pain somewhat relieved with ice, rates pain as 6 on a scale of 0–10. Dr. P. Yoshida notified. Lee Turno, RN."

Current

Timely entries are essential to the patient's ongoing care. Documentation should occur during or as soon as possible after the incident or intervention, and events should be described chronologically to reflect a clear record of exactly what happened (College of Nurses of Ontario, 2009). To increase accuracy and decrease unnecessary duplication, many health care agencies use bedside records, which facilitate immediate documentation of information as it is collected from a patient.

Flow sheets (described later in this chapter) are a means of entering current information quickly. Portable electronic workstations or secure wall cabinets in patient rooms help ensure that patient confidentiality is maintained. Nurses often keep notes on a worksheet when caring for several patients, making notes as the care occurs to ensure that entries recorded later in the record are accurate. The following activities and findings should be communicated at the time of occurrence:

- Vital signs
- Administration of medications and treatments
- Preparation for diagnostic tests or surgery
- Change in patient's status and who was notified (e.g., nurse practitioner, physician, manager, patient's family)
- Admission, transfer, discharge, or death of a patient
- Treatment for a sudden change in patient's status
- Patient's response to treatment or intervention

Health care agencies use military time, a 24-hour system that avoids misinterpretation of "A.M." and "P.M." times (Figure 15-2). Instead of two 12-hour cycles in standard time,

the military clock is one 24-hour time cycle. The military clock ends with midnight (2400) and begins with 1 minute after midnight (0001). For example, 10:22 A.M. is 1022 military time; 1:00 P.M. is 1300 military time.

Organized

As a nurse, you want to communicate information in a logical order. For example, an organized note describes the patient's pain, the nurse's assessment and interventions, and the patient's response. To write notes about complex situations in an organized manner, think about the situation and make notes of what is to be included before you begin to write in the permanent legal record.

Compliant With Standards

Documentation needs to follow standards set by Accreditation Canada and by provincial or territorial regulatory bodies to maintain institutional accreditation and to decrease the risk of liability. Current standards require that all patients who are admitted to a health care institution undergo physical, psychosocial, environmental, and self-care assessments; receive patient education; and be provided discharge planning. In addition, criteria for standards stress the importance of evaluating patient outcomes, including the patient's response to treatments, teaching, or preventive care.

The nursing service department of each health care agency selects a method of documenting patient care. The method reflects the philosophy of the nursing department and incorporates the standards of care. Because the nursing process shapes a nurse's approach and direction of care, effective documentation also reflects the nursing process.

Common Documentation Systems

Patient data can be recorded in several documentation systems. Each nursing service selects a documentation system that reflects the philosophy of its department. The same documentation system is used throughout a specific agency and may also be used throughout a health care system.

Narrative Documentation

Narrative documentation is the traditional method for recording nursing care. It is simply the use of a story-like format to document information specific to patient conditions and nursing care. Narrative charting, however, has many disadvantages, including the tendency to have repetitious information, to be time consuming to complete, and to require the reader to sort through much information to locate desired data.

Problem-Oriented Medical Records or Health Care Records

The **problem-oriented medical record** is a method of documentation that emphasizes the patient's problems. Data are organized by problem or diagnosis. Ideally, each member of the health care team contributes to a single list of identified patient problems. This assists in coordinating a common plan of care. The problem-oriented medical record has the following major sections: database, problem list, care plan, and progress notes.

Database. The database section contains all available assessment information pertaining to the patient (e.g., history and physical examination findings, the nurse's admission history and ongoing assessment, the dietitian's assessment,

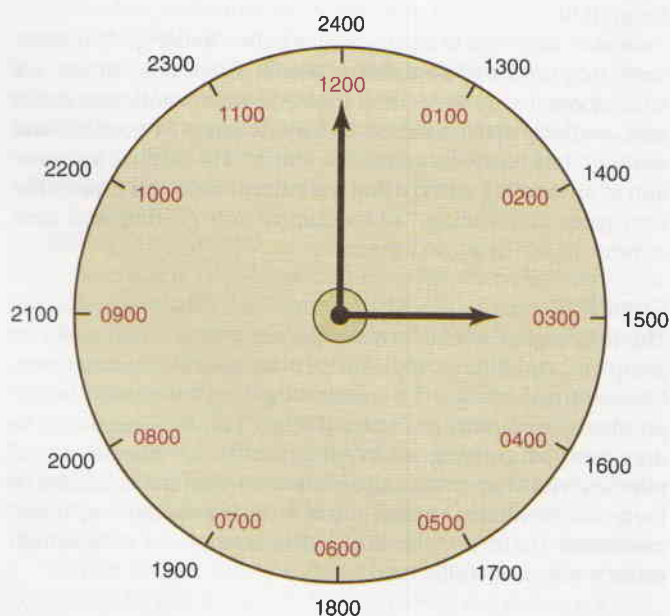


Figure 15-2 Military time clock.

laboratory reports). The database is the foundation for identifying patient problems and planning care. As new data become available, you revise the database. The database accompanies patients through successive hospitalizations or clinic visits.

Problem List. After analyzing data, health care team members identify problems and make a single problem list. The problems include the patient's physiological, psychological, social, cultural, spiritual, developmental, and environmental needs. Team members list the problems in chronological order and file the list in the front of the patient's record to serve as an organizing guide for the patient's care. You add new problems as they are identified. When a problem has been resolved, you record the date of resolution, and highlight the date or draw a line through the problem and its number.

Care Plan. A care plan is developed for each problem by the members of the health care team from each discipline involved in the patient's care. Nurses document the plan of care in a variety of formats. In general, these plans of care include nursing diagnoses, expected outcomes, and interventions.

Progress Notes. Health care team members monitor and record the progress of a patient's problems (Box 15-1). The information can be expressed in various formats. One method

is the **subjective-objective-assessment-plan (SOAP)** charting, involving subjective data (verbalizations of the patient), objective data (data that are measured and observed), assessment (diagnosis based on the data), and plan (what the caregiver plans to do). Some institutions add intervention (I) and evaluation (E) (i.e., **subjective-objective-assessment-plan-intervention-evaluation [SOAPIE]**). The logic for SOAP and SOAPIE notes is similar to that of the nursing process: to collect data about the patient's problems, draw conclusions, and develop a plan of care. The nurse numbers each SOAP or SOAPIE note and titles it according to the problem on the list.

A second progress note method is the **problem-intervention-evaluation (PIE)** format (see Box 15-1). It is similar to SOAP charting in its problem-oriented nature. However, it differs from the SOAP method in that PIE charting originated in nursing practice, whereas SOAP charting originated from medical records. The PIE format simplifies documentation by unifying the care plan and progress notes. PIE notes differ from SOAP notes because the narrative does not include assessment information. A nurse's daily assessment data appear on flow sheets, preventing duplication of data. The narrative note includes the problem, the intervention, and the evaluation. The PIE notes are numbered or labelled according to the patient's problems. Resolved problems are dropped from daily documentation after the nurse's review. Continuing problems are documented daily.

A third progress note format is **focus charting**. It involves use of **data-action-response (DAR)** notes, which include both subjective and objective data, the action or nursing intervention, and the response of the patient (i.e., evaluation of effectiveness). One distinction of focus charting is its movement away from charting only problems, which has a negative connotation. Instead, a DAR note addresses patient concerns: a sign or symptom, a condition, a nursing diagnosis, a behaviour, a significant event, or a change in a patient's condition. Documentation is written in accordance with the nursing process; nurses are encouraged to broaden their thinking to include any patient concerns, not just problem areas; and critical thinking is encouraged. The benefits of focus charting are that it incorporates all aspects of the nursing process, highlights the patient's concerns, and can be integrated into any clinical setting (*Mosby's Surefire Documentation*, 2006).

➤ BOX 15-1

Examples of Progress Notes Written in Different Formats

Subjective-Objective-Assessment-Plan (SOAP)

01/19/11 Knowledge deficit regarding surgery at 1630 hrs related to inexperience

S: "I'm worried about what it will be like after surgery."

O: Patient asking frequent questions about surgery. Has had no previous experience with surgery. Wife present and acting as a support person.

A: Knowledge deficit regarding surgery related to inexperience. Patient also expressing anxiety.

P: Explain routine preoperative preparation. Demonstrate and explain rationale for turning, coughing, and deep breathing (TCDB) exercises. Provide explanation and teaching booklet on postoperative nursing care. S. Lazarus, RPN

Problem-Intervention-Evaluation (PIE)

P: Knowledge deficit regarding surgery related to inexperience.

I: Explained normal preoperative preparations for surgery to patient. Demonstrated TCDB exercises. Provided booklet on postoperative nursing care to patient.

E: Patient demonstrates TCDB exercises correctly. Needs review of postoperative nursing care. S. Lazarus, RPN

Focus Charting: Data-Action-Response (DAR)*

D: Patient stating, "I'm worried about what it will be like after surgery." Patient asking frequent questions about surgery. Has had no previous experience with surgery. Wife present; acts as a support person.

A: Explained normal preoperative preparations for surgery to patient. Demonstrated TCDB exercises. Provided booklet on postoperative nursing care to patient.

R: Patient demonstrates TCDB exercises correctly. Needs review of postoperative nursing care. Patient states, "I feel better knowing a little bit of what to expect." S. Lazarus, RPN

*Some agencies also add P (Plan) to make DARP.

Source Records

In a **source record**, the patient's chart is organized so that each discipline (e.g., nursing, medicine, social work, respiratory therapy) has a separate section in which to record data. One advantage of a source record is that caregivers can easily locate the proper section of the record in which to make entries. Table 15-3 lists the components of a source record.

A disadvantage of the source record is that details about a specific problem may be distributed throughout the record. For example, in the case of a patient with bowel obstruction, the nurse describes in the nurses' notes the character of abdominal pain and the use of relaxation therapy and analgesic medication. In a separate section of the record, the physician's notes describe the progress of the patient's condition and the plan for surgery. The findings of X-ray examinations that reveal the location of the bowel obstruction are in the test results section of the record.

The nursing notes or progress notes section is where nurses enter a narrative description of nursing care and the patient's response (Box 15-2). It is also a section for documenting care

► **TABLE 15-3** Organization of Traditional Source Record

Sections	Contents
Admission sheet	Specific demographic data about patient: legal name, identification number, sex, age, birth date, marital status, occupation and employer, health card number, nearest relative to notify in an emergency, religious affiliation, name of attending physician, date and time of admission
Order sheet	Record of physician's or nurse practitioner's orders for treatment and medications, with date, time, and physician's signature
Nurse's admission assessment	Summary of nursing history and physical examination
Graphic sheet and flow sheet	Record of repeated observations and measurements such as vital signs, daily weights, and intake and output
Medical history and examination	Results of initial examination performed by physician, including findings, family history, confirmed diagnoses, and medical plan of care
Medication administration record (MAR)	Accurate documentation of all medications administered to patient: date, time, dose, route, and nurse's signature
Progress notes	Ongoing record of patient's progress and response to therapy completed by all members of the health care team. Included in this section is a narrative record of the nursing process written by nurses: assessment, nursing diagnosis, planning, implementation, and evaluation of care
Health care disciplines' records	Entries made into record by all health care-related disciplines: radiology, social work, laboratories, physiotherapy, and so forth
Discharge summary	Summary of patient's condition, progress, prognosis, rehabilitation, and teaching needs at time of dismissal from hospital or health care agency

► **BOX 15-2** Sample Narrative Note

04/03/11

1100 hrs: Patient states, "I'm having a hard time catching my breath." R [Respirations], laboured at 32/min; P [pulse] 120; BP 112/70. Oxygen saturation 90% on room air. Patient alert and oriented. Patient using intercostal muscles during inspiration. Wheezes noted in both lower lobes. Chest excursion equal bilaterally. Elevated head of bed to Fowler's position. Obtained arterial blood gas (ABG) sample at 1045. O₂ started at 2 L/min per nasal prongs as ordered. Remained at bedside to calm patient. P. Haske, RN

1130 hrs: Results of ABGs reported to Dr Stein are pH 7.34; PCO₂ [partial pressure of carbon dioxide] 44 mm Hg; PO₂ [partial pressure of oxygen] 80 mm Hg.

Patient states, "It is easier to breathe now." R 24/min; P 96; BP 110/72. Oxygen saturation 97% on O₂ at 2 L/min per nasal prongs, lips pale pink; capillary refill less than 3 seconds. Wheezing still audible on auscultation. Patient remains in high Fowler's position. P. Haske, RN

that is provided by the physician or nurse practitioner in the nurse's presence. The nurse may record key diagnostic test results from other sections of the record in the nurses' notes if they are of major importance in the care of the patient.

Charting by Exception

Charting by exception (CBE) focuses on documenting deviations from the established norm or abnormal findings. This approach reduces documentation time and highlights trends or changes in the patient's condition (*Mosby's Surefire Documentation*, 2006). It is a shorthand method for documenting normal findings and routine care on the basis of clearly defined standards of practice and predetermined criteria for nursing assessments and interventions. Clearly defined standards of practice that specify nurses' responsibilities to patients provide

the framework for routine care of all patients. With standards integrated into documentation forms, such as predefined normal assessment findings or predetermined interventions, you only need to document significant findings or exceptions to the predefined norms. In other words, you write a progress note only when the standardized statement on the form is not met. Assessments are standardized on flow sheets or other forms so that all caregivers evaluate and document findings consistently (Figure 15-3).

Because the standard assessments are located in the chart, patient data are already present on the permanent record, and so you do not need to keep temporary notes for later transcription, and caregivers have easy access to current data. The assumption with CBE is that all standards are met unless otherwise documented.

When you see entries in the chart, you know that something out of the ordinary has been observed or has occurred. For that reason, when changes in a patient's condition have developed, it is easy to track them.

When patients' conditions change, it is essential to describe thoroughly and precisely what happens to patients and the actions taken. CBE can pose legal risks if nurses are not diligent in documenting exceptions. This charting method fails to provide a thorough picture of a patient's developing condition and does not reflect communication among members of the health care team (*Mosby's Surefire Documentation*, 2006). If nurses rely too heavily on charting standard categories and do not enter exception notes, the patient's situation will not be clear. CBE can also be problematic when related documentation forms do not have space allotted for documenting patient and family perspectives.

Case Management Plan and Critical Pathways or Care Maps

The **case management** model of delivering care (see Chapter 10) incorporates a multidisciplinary approach to documenting patient care. In many organizations, the standardized plan of

PATIENT CARE SERVICES
Interdisciplinary Systems Flowsheet

Key: Initials in Box = Assessment findings meet standards and procedures. Care provided. Initials in Box = Significant findings (abnormal or changed) Document in progress notes
→ & Initials in Box = Significant findings (has not changed)
= Monitored on High Frequency Flow Sheet

CLINICAL PATHWAY NAME: _____
Year _____ DATE _____
Month _____ TIME 24 hr _____

NEUROLOGICAL
Alert & oriented to person, place, time. Behaviour appropriate to situation. Follow simple commands. Verbalization clear and understandable. Pupils equal. Purposeful movement of all extremities and symmetry of strength. Sensation intact. Swallows without choking. Post Op: Mild to moderately sedated for first 24 hours. Easy to rouse.

☐ See pre-existing condition Assessment

SLEEP
Patient wakes feeling rested or sleep pattern within patient's norm.

☐ See pre-existing condition Assessment

CARDIOVASCULAR
Regular radial pulse 60 to 100 bpm. No edema, no chest pain, no diaphoresis. No calf tenderness. BP - Systolic 90 - 140. Diastolic 50 - 90 mmHg.

☐ See pre-existing condition Assessment

RESPIRATORY
Respirations quiet, regular, unlaboured, 10 - 20 per min. at rest. Sputum absent or clear. No pallor or cyanosis of nailbeds or mucous membranes. Oximetry as per patient standard. Auscultation: Breath sounds clear & audible both lung fields. BIPAP: 1=Mask off, 2=Mask on.

☐ See pre-existing condition Assessment

Assessment Auscultation
BIPAP
Chest Physio
Tracheotomy Care
Suctioning

PERIPHERAL VASCULAR
Extremities pink, warm. Sensation present. Peripheral pulses palpable. No limb edema. no calf tenderness. Capillary refill < 3 seconds. CSM-Pulses 0=Absent 1+=Weak & Thready 2+=Normal 3+=Full and Bounding. Sensation/movement - (all limbs) Y=Yes N=No

☐ See pre-existing condition Assessment

CSM Location: _____ Pulses
Sensation/ Movement

Page 1 of 2

Figure 15-3 Example of a standardized form (in this case, a patient care flow sheet) that can be used for charting by exception; predefined normal assessment findings are listed on the form, and you note when assessment findings are not normal or have changed. *ADL*, Activities of daily living; *AP*, anteroposterior (film); *BIPAP*, bilevel positive airway pressure; *CSM*, circulation, sensation, and movement; *ROM*, range of motion; *subcut*, subcutaneous; *TPN*, total parenteral nutrition. **Source:** Courtesy Queensway-Carleton Hospital (2004), Nepean, Ontario.

INTERDISCIPLINARY SYSTEMS ASSESSMENT FLOWSHEET
Initial all relevant items. Leave others blank.
Document Clinical Pathway Items on Clinical Pathway.

CLINICAL PATHWAY NAME: _____
Year _____ DATE _____
Month _____ TIME 24 hr _____

GASTROINTESTINAL
No nausea, vomiting or pain. Bowel movements within patient's norm. Continent. Abdomen soft. Bowel sounds active in all 4 quadrants. Post-op: bowel sounds: Absent - sluggish - normal first 24 hrs. Post-op: nausea (scale 0-5) 0=none, 1-2=mild, 3-4=moderate, 5=severe. Nasogastric drainage: bile coloured fluid.

☐ See pre-existing condition Assessment

Bowel sounds Hypoactive
Absent

Nausea Scale

Skin Care Protocol

Nasogastric Drainage (Colour)

GENITOURINARY
Genitalia: No edema, bruising, lesions, abnormal discharge. Vaginal Flow: Scant to moderate, light pink to serosanguinous to brownish drainage. No foul odours or bright red bleeding. Few clots may be present. Bladder: Able to empty bladder. Output: >30 cc q 1 h. Not distended. Urine clear, yellow to amber, continent. No pain or burning on voiding. Catheter: Urinary drainage system patent. Cleansed q shift. Change as per protocol - Δ.

☐ See pre-existing condition Assessment Genitalia

Assessment Vaginal Flow

☐ See pre-existing condition Assessment Bladder

Catheter ☐ Indwelling ☐ Intermittent

Sitz Bath

MUSCULOSKELETAL/ADL
No swelling, tenderness, weakness or muscle spasms. Functional ROM for all joints. Mobility: Able to ambulate; steady balance; purposeful gait. Post op: as ordered. ADL=Progressing to optimal level of functioning. Mobility/ADL Levels: 1-Total Assistance 2-Maximum Assistance 3-Moderate Assistance 4-Minimum Assistance 5-Supervision Only 6-Independent with Aide 7-Independent.

☐ See pre-existing condition Assessment

Mobility

ADL

Activity

PSYCHOSOCIAL DISCHARGE PLANNING
Psychosocial: Has realistic perception of what is happening. Affect appropriate. No mood swings noted. Discharge Planning: Plans progressing according to Care Plan.

Assessment: Psychosocial

Discharge Planning

Page 2 of 2

PATIENT CARE SERVICES Interdisciplinary Care Flowsheet		DATE TIME 24 hr	Initial all relevant items. Leave others blank. Document Clinical Pathway items on Clinical Pathway.											
Key: Initials in Box = Assessment findings meet standards and procedures Interventions tolerated or care provided. • & Initials in Box = Significant finding(s) abnormal or changed. Document in progress notes. → & Initials in Box = Significant finding(s) has not changed. [V] = Monitored on High Frequency Flow Sheet.														
CLINICAL PATHWAY NAME: Year _____ Month _____														
NUTRITION ☐ See pre-existing condition Assessment Assessment: Oral Intake Assessment: Swallowing Assessment: Tube Feeding/TPN		Maintaining healthy body weight. Feeds self. No dehydration. Oral Intake: Consuming at least 3/4 of prescribed diet. Swallowing: No coughing/choking on liquids/solids. Tube Feed/TPN: Tolerating prescribed type, rate & amount of feeding. Flush enteral tube and change dressing as per protocol. Δ=dressing change												
INTEGUMENTARY ☐ See pre-existing condition Assessment Hygiene Reposition as per protocol Pressure support surface: _____		Skin warm, dry & intact, mucous membranes moist. Able to reposition self. Normal Braden Scale.												
WOUND / ULCER / INCISION Site 1: _____ Assessment/Stage _____ Dressing Type: _____ Drainage _____ Site 2: _____ Assessment _____ Dressing Type: _____ Drainage _____ Site 3: _____ Assessment _____ Dressing Type: _____ Drainage _____		Site: No redness, inflammation. Incision well approximated. Sutures, staples, staples intact. DIC=staples, sutures removed. Stage: I=red, non-blanchable, II=blister, broken epidermis, III= subcutaneous tissue visible, IV=muscle, bone or tendon exposed, X=black necrotic tissue on wound. Dressing: dry and intact. Δ=dressing change. Drainage: S=serous, SG=serosanguineous. Amount: 1=nil, 2=small, 3=moderate, 4=copious.												

INTERDISCIPLINARY CARE FLOWSHEET Complete and Initial all relevant items. Leave others blank. Document Clinical Pathway items on Clinical Pathway.		DATE TIME 24 hr	Initial all relevant items. Leave others blank. Document Clinical Pathway items on Clinical Pathway.											
CLINICAL PATHWAY NAME: Year _____ Month _____														
PAIN / COMFORT Location #1 _____ Pain Score _____ Location #2 _____ Pain Score _____ Ice/heat _____		Patient describes pain as nil, mild, or moderate & is satisfied with management. Pain Scale: 0=0 (none to excruciating)												
SAFETY Assessment _____ Restraint: _____		Low risk for falls or wandering. Basic safety precautions in place. Low risk to harm self or others. Restrained as per protocol.												
TEACHING / LEARNING Assessment _____		Verbalizing & understands treatment goals & care needs. Educational goals met as per teaching plan.												
PERIPHERAL / CENTRAL LINES / SALINE LOCK Site Assessment dLock oPeripheral oCentral oOther oS/C line Site Assessment dLock oPeripheral oCentral oOther oS/C line Site Assessment dLock oPeripheral oCentral oOther oS/C line		Absence of redness, swelling or tenderness at site. IV infusing at prescribed rate. IV site checked as per protocol. Saline lock patent. Flushed as per protocol. Δ=dressing change												
DRAINS Type: _____ Location #1: _____ Type: _____ Location #2: _____ Type: _____ Location #3: _____ Type: _____ Location #4: _____		Patent & draining as expected. Drainage: S=serous, SS=sanguineous, SG=serosanguineous. P=purulent, B=bile, I=irrigated. Amount: 1=nil, 2=small, 3=moderate, 4=copious. SH=shortened. DIC=discontinued.												
TRANSURETHRAL PROCEDURES Bladder Irrigation _____ Urine Drainage _____		Urine: C=Clear, P=pink, T=tea coloured, M=moderate sanguineous, SC=Sanguineous with clots, DIC=discontinued.												
CHEST TUBE Assessment _____ Drainage _____		Patent. Dressing dry and intact. Suction method as ordered. Drainage: S=serous, SS=sanguineous, SG=serosanguineous, P=purulent.												
CAST SITE Assessment _____ Damp _____		Cast dry and intact; nil-minimal drainage; sensation normal; swelling nil-minimal. Damp 24-48 hours.												

Figure 15-3, cont'd

care is summarized into critical pathways for a specific disease or condition. The **critical pathways** or **care maps** are multidisciplinary care plans that include patient health concerns, key interventions, and expected outcomes within an established time frame (Figure 15-4). In a computerized charting system, professionals from many disciplines may access the chart, and this integration of information from the different disciplines can be accessed easily from every computer terminal in the institution at any time. The nurse and other team members such as physicians, nurse practitioners, dietitians, social workers, physiotherapists, and respiratory therapists use the same critical pathway to monitor the patient's progress during each shift or, in the case of home care, during every visit.

Critical pathways eliminate the need for nurses' notes, flow sheets, and nursing care plans because the pathway document integrates all relevant information. Unexpected occurrences, unmet goals, and interventions not specified within the clinical pathway time frame are called **variances**. A variance is present when the activities on the clinical pathway are not completed as predicted or the patient does not meet the expected outcomes. An example of a negative variance is when a patient postoperatively develops pulmonary complications necessitating oxygen therapy and monitoring with pulse oximetry. An example of a positive variance is when a patient progresses more rapidly than expected (e.g., use of a Foley catheter may be discontinued a day early). A variance analysis is necessary to review the data for trends and for developing and implementing an action plan to respond to the identified patient problems (Box 15-3). In addition, variances may result from changes in the patient's health or may occur as a result of other health complications not associated with the primary reason why the patient requires care. Once a variance has been identified, the nurse modifies the patient's care to meet the needs associated with the variance.

Consensus on the definition and impact of critical pathways is lacking. The pathways were developed to improve the efficiency of care in hospitals and as a cost containment measure to reduce length of hospital stay. According to Dy and colleagues (2005), critical pathways may be effective only under certain circumstances (e.g., first pathway implemented in a particular practice area or for lesser severity of illness).

► BOX 15-3

Example of Variance Documentation

A 56-year-old patient is on a surgical unit one day after a bowel resection. His temperature is slightly elevated, his breath sounds are decreased bilaterally at both lung bases, and he is slightly confused. Ordinarily, one day postoperatively, a patient should be afebrile with clear lungs. The following is an example of the variance documentation for this patient.

9/23/10

1000 hrs: Breath sounds diminished bilaterally at the bases. T [temperature] 37.8°C; P 92; R 28/min; oxygen saturation 84%. Daughter states he is "confused" and did not recognize her when she arrived a few minutes ago. Oxygen started at 2 L/min via nasal prongs. Head of bed elevated. Will monitor oxygen saturation and vital signs every 15 minutes. Dr. P. Yoshida notified of change in status. Daughter at bedside. R. Balliol, RN

Common Record-Keeping Forms

A variety of forms are specially designed for the type of information that nurses routinely document. The categories within a form are usually derived from institutional standards of practice or guidelines established by accrediting agencies.

Admission Nursing History Forms

A nursing history form is completed when a patient is admitted to a nursing care unit. The history form guides the nurse through a complete assessment to identify relevant nursing diagnoses or problems (see Chapter 12). Data on history forms provide baselines that can be compared with changes in the patient's condition.

Flow Sheets and Graphic Records

Flow sheets are forms in which nurses can quickly and easily enter assessment data about the patient, including vital sign measurements and routine repetitive care actions, such as hygiene measures, ambulation, meals, weights, and safety and restraint checks (Box 15-4). The format of the flow sheet varies in accordance with the agency and the data being recorded. For example, some flow sheets may be used only to record vital sign measurements (often called *graphic records*); others may be more comprehensive (Figure 15-5; note that Figure 15-3 shows a flow sheet that is used for CBE). For flow sheets, a coding system is used for data entry. It is important to fill out all spaces on the flow sheet, even for items that are "not applicable" (for which you can write "N/A"). A blank space can raise doubts about whether an intervention was or was not performed. If an occurrence recorded on the flow sheet is unusual or changes significantly, a focus note is needed (see Box 15-3). For example, if a patient's blood pressure becomes dangerously high, the nurse completes a focus assessment and records the findings, as well as action taken, in the progress notes. Flow sheets provide a quick, easy reference for the health care team members in assessing a patient's status. Critical care and acute care units commonly use flow sheets for all types of physiological data.

Patient Care Summary or Kardex

Many agencies now have computerized systems that provide basic, summative information in the form of a patient care summary. This is printed out for each patient during each shift. This summary is continually updated and provides the nurse with a current detailed list of orders, treatment, and diagnostic testing. In some settings, a **Kardex** system, a portable "flip-over" file or binder, is kept at the nurses' station. Most Kardex forms have an activity and treatment section and a nursing care plan section that organize information for quick reference as nurses give change-of-shift reports or make walking rounds. An updated Kardex form eliminates the need for repeated referral to the chart or computer record for routine information

Text continued on p. 219

► BOX 15-4

Benefits of Using a Flow Sheet

- Information is accessible to all members of the health care team.
- Time spent on writing a narrative note is decreased.
- Information is current.
- Errors resulting from transfer of information are decreased.
- Team members can quickly see trends over time.



Hemi-Knee Arthroplasty Hemi-genou arthroplastie

☐ Civic ☐ Gen.-Gén.

Addressograph/Plaque

PAU — Unité pré-admission	Day of Surgery Pre-op — SDA/SDCU — Jour de la chirurgie pré-opératoire
Date: yyaa _____ mm _____ dj _____	Date: yyaa _____ mm _____ dj _____
Critical Path	Critical Path
- Assessment & teaching per PAU standard of care and procedure specific education material - Pre-operative diagnostic testing as per PAU Medical Directive for Pre-Admission Diagnostic Testing for Elective Surgery Tests - CBC - PTT, INR - Type and screen Additional Orders - Social work consult if indicated - X-ray: 1) Standing AP of both knees 2) Lateral and skyline patella view of operative knee Discharge Planning - Discuss expected length of stay (LOS) - Discuss issues that could cause delay of discharge & discuss discharge preparation - Provide patient with Hemi-Knee Arthroplasty education booklet	- Assessment and teaching per same day admission standard of care and procedure specific education material. Tests - Glucose meter: for diabetic patient - PTT/INR: for patient normally taking warfarin (Coumadin) – Unless normal result obtained after warfarin discontinued per pre-op instructions - Electrolytes: for dialysis dependant patient unless acceptable post-dialysis results obtained within 24 h of surgery - CBC if autologous blood donor Additional Orders - IV NS at 50 mL/h if IV medications to be given in SDA/SDCU OR If patient is insulin-dependent diabetic: IV D5W @ 100 mL/h Antibiotics: - If No history of allergy to penicillin or to other beta-lactam antibiotics; <i>or</i> - History of non-life threatening reaction to penicillin or other beta-lactam antibiotics (eg. rash, diarrhea, stomach upset) IV Cefazolin on chart for administration in OR: 1 g if weight < 60 kg 2 g if weight ≥ 60 kg Or - If patient has a history of life threatening reaction (hypotension, bronchospasm, urticaria, angioedema) to penicillin or other beta-lactam antibiotics IV Vancomycin: 1 g if weight < 90 kg (infuse over 60 minutes pre-op) 1.5 g if weight ≥ 90 kg (infuse over 90 minutes pre-op)
Patient Outcomes	Patient Outcomes
Patient/Family Teaching - Understands pre-op instructions and events - Understands usual post-op course, plan for pain management, and usual self care measures to prevent post-op complications Discharge Planning - Understands usual LOS - Appropriate discharge plan in place or if not suitable discharge plan in place – social work has been consulted	Patient Teaching - Adherence with pre-op instructions - Understands usual events/expectations of operative day - Understands usual post-op course, plan for pain management, and usual self care measures to prevent post-op complications
Patient progress corresponds with clinical pathway	Patient progress corresponds with clinical pathway
Nursing: ☐ Yes ☐ No Signature: _____ Time: _____ NTV – circle above, VC _____	Nursing: ☐ Yes ☐ No Signature: _____ Time: _____ NTV – circle above, VC _____
Variance Codes (VC) 186 Activity variance 653 Consult not sent by Day 3 492 Not discharged by end of pathway – continued need for acute care	510 Not discharged by end of pathway – non-medical reason NTV Non-Tracked Variance OFF Ordered off clinical pathway

Figure 15-4 Example of a critical pathway (care map) for a hemi-knee arthroplasty. ALC, Alternative level of care; AP (anterior-posterior [film]); APS, acute pain service; CBC, complete blood cell count; CPM, continuous passive motion; D/C, discontinue; DVT, deep vein thrombosis; IHT, interhospital transfer; INR, international normalized ratio; IV D5W, intravenous 5% dextrose in water; IV NS, intravenous normal saline; NPO, nothing by mouth; NVS, neurovascular system; O₂, oxygen; PRN, as needed; PACU, postanesthesia care unit; PTT, partial thromboplastin time; SDA, same-day admission; SDCU, surgical day care unit; SpO₂, pulse oximetry; VS, vital signs. **Source:** Courtesy The Ottawa Hospital (L'Hôpital d'Ottawa) (2008), Ottawa, Ontario.

Patient(e) _____		Chart No. – N° du dossier _____	
Day of Surgery Post-op / PACU Jour de la chirurgie / Post-opératoire / Unité de soins post-anesthésiques		Day of Surgery Post-op Ward Jour de la chirurgie / Post-opératoire / Unité régulière	
Date: yyaa _____ mm _____ dj _____		Date: yyaa _____ mm _____ dj _____	
Critical Path	Patient Outcomes	Critical Path	Patient Outcomes
• SpO₂ monitoring and O₂ administration per PACU protocol • VS, assessment, treatment, and teaching per PACU standard of care Additional Orders • Bedrest • NPO to Clear fluids prn	• Achieves PACU criteria for transfer to Ward	Assessments/Treatments • VS, NVS, pain q4h x 24 hrs, SpO₂ • Monitor Hemovac drainage • Monitor Dressing • Monitor Intake & Output • Pain management as per APS Activity • Up in chair x 1 _____ initial • Ambulate x 1 with assistance, if able _____ initial • CPM as ordered (when dressing removed) Nutrition • Diet as ordered Elimination • Catheter as ordered Patient Teaching • Reinforce: - Deep Breathing and Coughing (DB&C) - ankle pumping - positioning of the leg when on back and on side • Pain management • Ensure patient has Hemi-Knee Arthroplasty booklet Discharge Planning • Per Discharge Preparation indicators	Pain Control • Adequate pain control achieved: Pain ≤ 3 rest, ≤ 5 activity; pain not preventing movement; satisfied with pain control Activity • Demonstrates understanding of positioning Prevention of DVT • Performs ankle exercises Prevention of Infection • Verbalizes importance of adequate hydration • Performs DB&C Patient Teaching • Demonstrates: - DB&C - Positioning of leg - Ankle exercises
Patient progress corresponds with clinical pathway		Patient progress corresponds with clinical pathway	
Nursing: ☐ Yes ☐ No Signature: _____ Time: _____ NTV – circle above, VC _____		Nursing: D ☐ Yes ☐ No Signature: _____ Initials _____ Time: _____ NTV – circle above, VC _____ E ☐ Yes ☐ No Signature: _____ Initials _____ Time: _____ NTV – circle above, VC _____ N ☐ Yes ☐ No Signature: _____ Initials _____ Time: _____ NTV – circle above, VC _____	
D = 8-12 h day shift		E = evening shift, if applicable N = 8-12 h night shift	
Variance Codes (VC) 186 Activity variance 653 Consult not sent by Day 3 492 Not discharged by end of pathway – continued need for acute care 510 Not discharged by end of pathway – non-medical reason NTV Non-Tracked Variance OFF Ordered off clinical pathway			

Figure 15-4, cont'd

Continued

Patient(e) _____		Chart No. – N° du dossier _____	
Post-op Day 1 — Jour 1 post-opératoire			
Date: yyaa _____ mm _____ dj _____			
Critical Path		Patient Outcomes	
Consults ☐ Outpatient physio or ☐ Short Term Rehab Assessments/Treatments - VS, NVS, pain q4h → q shift, SpO₂ - Monitor Intake & Output - D/C Hemovac - D/C dressing & change to strip – If drainage notify MD - Pain management as per APS. Discontinue APS modality as per weaning guideline if patient meets criteria Activity - DB&C - Exercise program - Up in chair x 2 _____ initial, _____ initial - Ambulate x 2 with assistance: _____ initial, _____ initial - Assistive devices, specify: _____ - CPM as ordered Nutrition - Diet as ordered Elimination - Discontinue Foley catheter Patient Teaching - Reinforce exercise program - If patient on Low Molecular Weight Heparin – start self injection teaching - Pain Management Discharge Planning - Equipment needs addressed - Confirm out-patient physio if applicable - If patient is not expected to achieve discharge criteria by Post-op Day 2, and meets the criteria for rehab, consult service for transfer - Discharge plan confirmed with patient / family – If transferring to another facility: Specify facility _____ - Confirm (✓) arrangements re: ☐ Discharge Summary ☐ IHT / Nurses letter ☐ Doctor's letter ☐ Ambulance booked or transportation arranged <i>(see last page for rehab criteria)</i>		Patient Teaching - Verbalizes understanding of "Hemi-Knee Arthroplasty" instructions and exercise program - Understands the basics of self injection if applicable - Demonstrates: – Proper positioning – Understanding of mobility aids Pain Control - Adequate pain control achieved: Pain ≤ 3 rest, ≤ 5 activity; pain not preventing movement; satisfied with pain control Activity - Completes transfer with assistance - Performs exercises according to self directed program Prevention of DVT - Demonstrates appropriate exercises & positioning for prevention of DVT - Verbalizes understanding of anticoagulant therapy	
Patient progress corresponds with clinical pathway			
Physiotherapy: ☐ Yes ☐ No Signature: _____ Time: _____ NTV – circle above, VC _____			
Nursing: D ☐ Yes ☐ No Signature: _____, Initial _____ Time: _____ NTV – circle above, VC _____ E ☐ Yes ☐ No Signature: _____, Initial _____ Time: _____ NTV – circle above, VC _____ N ☐ Yes ☐ No Signature: _____, Initial _____ Time: _____ NTV – circle above, VC _____			
D = 8-12 h day shift E = evening shift, if applicable N = 8-12 h night shift			
Variance Codes (VC) 186 Activity variance 653 Consult not sent by Day 3 492 Not discharged by end of pathway – continued need for acute care 510 Not discharged by end of pathway – non-medical reason NTV Non-Tracked Variance OFF Ordered off clinical pathway			

Figure 15-4, cont'd

Patient(e) _____	Chart No. – N° du dossier _____		
Post-op Day 2 / Discharge Day — Jour 2 post-opératoire / Jour de congé			
Date: yyaa _____ mm _____ dj _____			
Critical Path	Patient Outcomes		
Assessments/Treatments • VS / NVS q shift, SpO₂ • Pain q4h • Wound care Activity • Continue exercise program • Ambulate x 2 • CPM as ordered • Assistive devices, specify: _____ • Gait training on stairs if required Nutrition • Diet as ordered Elimination • Assess for patient's normal bowel pattern Patient Teaching • Review physician specific discharge instructions and provide discharge instruction sheet • Assess patient for knowledge of discharge instructions / Hemi-Knee Arthroplasty precautions • Review anticoagulant therapy and self injection teaching if applicable • Review Question and Answer sheet in booklet • Review pain management plan Discharge Planning • Patient to be discharged unless otherwise indicated by physician • Discharge patient after seen by Physio in p.m., once discharge criteria met • If unable to discharge today: – Verify ALC status if discharge delayed and acute care no longer required – Document appropriate delay of discharge variance code – Discontinue pathway after Day 2	Discharge Criteria • Patient / family understand post-discharge care and follow-up plan • Adequate pain control • No clinical evidence of DVT • If patient on Low Molecular Weight Heparin – is able to give own injection • No clinical signs of infection • Adequate bowel function and understands bowel management plan • Appropriate gait aides arranged • Ambulates independently with assistive devices • Safe on stairs (if needed) • Transfers independently with mobility devices • Appropriate place to go and support available as required post-discharge		
Patient progress corresponds with clinical pathway			
Physiotherapy: ☐ Yes ☐ No Signature: _____ Time: _____ NTV – circle above, VC _____ Nursing: D ☐ Yes ☐ No Signature: _____, Initial _____ Time: _____ NTV – circle above, VC _____ E ☐ Yes ☐ No Signature: _____, Initial _____ Time: _____ NTV – circle above, VC _____ N ☐ Yes ☐ No Signature: _____, Initial _____ Time: _____ NTV – circle above, VC _____			
D = 8-12 h day shift E = evening shift, if applicable N = 8-12 h night shift			
Variance Codes (VC) <table style="width: 100%;"> <tr> <td style="width: 50%;"> 186 Activity variance 653 Consult not sent by Day 3 492 Not discharged by end of pathway – continued need for acute care </td> <td style="width: 50%;"> 510 Not discharged by end of pathway – non-medical reason NTV Non-Tracked Variance OFF Ordered off clinical pathway </td> </tr> </table>		186 Activity variance 653 Consult not sent by Day 3 492 Not discharged by end of pathway – continued need for acute care	510 Not discharged by end of pathway – non-medical reason NTV Non-Tracked Variance OFF Ordered off clinical pathway
186 Activity variance 653 Consult not sent by Day 3 492 Not discharged by end of pathway – continued need for acute care	510 Not discharged by end of pathway – non-medical reason NTV Non-Tracked Variance OFF Ordered off clinical pathway		

Figure 15-4, cont'd

throughout the day. In many institutions, entries on Kardex forms are made in pencil because of the need for frequent revisions as the patient's needs change. In settings in which the Kardex form is a permanent part of the patient's record, entries are made in ink. Information commonly found on the patient care summary or Kardex form includes the following:

- Basic demographic data (e.g., age, sex, religious affiliation)
- Hospital identification number
- Physician's name
- Primary medical diagnosis
- Medical and surgical history
- Current physician's or nurse practitioner's treatment orders to be carried out by the nurse (e.g., dressing changes, ambulation, glucose monitoring)
- Nursing care plan
- Nursing orders (e.g., education sessions, symptom relief measures, counselling)
- Scheduled tests and procedures
- Safety precautions to be used in the patient's care
- Factors related to activities of daily living
- Contact information about nearest relative or guardian or person to contact in an emergency
- Emergency code status
- Allergies

Acuity Records or Workload Measurement Systems

Acuity records (also known as **workload measurement systems**) provide a method of determining the hours of care and staff required for a given group of patients. A patient's *acuity level* is based on the type and number of nursing interventions required for providing care in a 24-hour period. The acuity level determined by the nursing care allows patients to be rated in comparison with one another. For example, an acuity system might rate bathing patients from 1 to 5 (1 means patient is totally dependent on others for bathing, 5 means patient bathes independently). A patient who has just undergone surgery and who requires frequent monitoring and extensive care may be listed with an acuity level of 1. On the same continuum, another patient awaiting discharge after a successful recovery from surgery has an acuity level of 5. Accurate acuity ratings may also be used to justify overtime and the number and qualifications of staff needed to safely care for patients. The patient-to-staff ratios established for a unit depend on a composite gathering of data for the 24-hour interventions that are necessary for each patient receiving care.

Standardized Care Plans

Some institutions use **standardized care plans** to make documentation easier for nurses. The plans, based on the institution's standards of nursing practice, are preprinted, established guidelines that are used to care for patients who have similar health problems. After a nursing assessment is completed, the staff nurse identifies the standard care plans that are appropriate for the patient. The care plans are placed in the patient's health care record. The standardized plans can be modified (and changes are noted in ink) to individualize the therapies. Most standardized care plans also allow the nurse to write in specific goals or desired outcomes of care and the dates by which these outcomes should be achieved.

One advantage of standardized care plans is establishment of clinically sound standards of care for similar groups of

► BOX 15-5 Discharge Summary Information

- Use clear, concise descriptions in patient's own language.
- Provide step-by-step description of how to perform a procedure (e.g., home medication administration). Reinforce explanation with printed instructions.
- Identify precautions to follow when the patient performs self-care or administers medications.
- Review signs and symptoms of complications that should be reported to the primary care practitioner.
- List names and phone numbers of health care providers and community resources that the patient can contact.
- Identify any unresolved problem, including plans for follow-up and continuous treatment.
- List actual time of discharge, mode of transportation, and who accompanied the patient.

patients. These standards can be useful when quality improvement audits are conducted. These care plans can help nurses recognize the accepted requirements of care for patients and also improve continuity of care.

The use of standardized care plans is controversial. The major disadvantage is the risk that the standardized plans prevent nurses from providing unique, individualized therapies for patients. Standardized care plans cannot replace the nurse's professional judgement and decision making. In addition, care plans need to be updated on a regular basis to ensure that content is current and appropriate.

Discharge Summary Forms

It is important to prepare patients for an efficient, timely discharge from a health care facility. A patient's discharge should also result in desirable outcomes. Multidisciplinary involvement in discharge planning helps ensure that a patient leaves the hospital in a timely manner with the necessary resources in place (Box 15-5).

Ideally, discharge planning begins at admission. You need to revise the care plan as the patient's condition changes. Remember to involve the patient and family members in the discharge planning process so that they have the information needed to return the patient home. Discharge information and instructions should include data such as the following:

- Instruction about potential food–drug interactions, nutrition intervention, and modified diets
- Rehabilitation techniques to support adaptation to, or functional independence in, the environment, or both
- Access to available community resources
- Circumstances in which patients should obtain further treatment or follow-up care
- Methods of obtaining follow-up care
- The patient's and family's responsibilities in the patient's care
- Medication instructions, including the times and reasons to take each medication, the dose, the route, precautions, possible adverse reactions, and information about when and how to get prescriptions refilled

Furthermore, a common standard in nursing practice is to educate patients about the nature of their disease process, its likely progress, and the signs and symptoms of complications.

When a patient is discharged from inpatient care, a discharge summary that includes information from members of the health care team is prepared. The summary is given to the patient or family or to the home care, rehabilitation, or long-term care agency. Discharge summary forms help make the summary concise and instructive (Figure 15-6). A summary form emphasizes previous learning by the patient and family and care that should be continued in any restorative care setting. When given directly to patients, the form may be attached to pamphlets or teaching brochures.

Home Health Care Documentation

As a result of shorter hospitalizations and larger numbers of older adults who require home care services, home health care is expanding. Because patients are leaving acute care settings earlier, increasing numbers of home care patients are presenting in the community setting with more acuity (i.e., sicker). The focus in home health care is on family-centred care and forming a partnership or collaboration with the patient and the family to help the patient regain health, to help the family take over the patient's care, or to help accomplish both. Documentation in the home health care system has different implications than in other areas of nursing. Two primary differences are that the majority of the care is performed by the patient and family and that the nurse is often teaching and helping the patient and family achieve greater independence. Nurses must have astute assessment skills to gather the needed information about changes in the patient's health care status. In addition, documentation systems need to provide the entire health care team with the information needed for them to work together effectively (Box 15-6).

In the home care setting, the patient is the guardian of the health care record. A hard copy of the health care record is kept in the patient's home, and the patient is responsible for its safekeeping. Communication is crucial in home care because much of the interaction between health care providers is conducted virtually by phone or fax over password-protected voice mail or secure fax lines. With the increasing availability of hand-held devices such as **personal digital assistants**

(PDAs), smart phones, and laptop computers or tablets, records can be available in multiple locations, which enables easier access to the multidisciplinary needs that are often associated with home care. Privacy remains a unique challenge in home health care, however, inasmuch as not all member of the health care team have access to secure electronic transmission of confidential material (e.g., as is the case in physicians' offices).

Long-Term Health Care Documentation

An increasing number of older adults require care in long-term care or residential facilities. Many individuals live in this setting for the rest of their lives and are therefore referred to as **residents** rather than as *patients*. In long-term care settings, nursing personnel face challenges much different from those in acute care settings. Residents' health is often stable, and so daily documentation can be completed on flow sheets. Assessments performed several times a day in acute care settings are required only weekly or monthly in long-term care settings.

Governmental agencies and provincial and territorial laws are instrumental in determining the standards and policies for documentation. Documentation is used to review the levels of care given to and needed by residents in long-term care facilities. Although most long-term care facilities have different documentation systems, these systems are based on the need for a concise, nonduplicating method of documentation and on the importance of nursing documentation in support of evidence-informed practice (Box 15-7).

Computerized Documentation

Many hospitals are using computerized documentation systems or are in the process of transitioning to computerized charting. Current software programs enable nurses to quickly enter specific assessment data, fill in forms with typical entry choices, and enter narrative for unique situations; computer memory is also adequate for large amounts of data, and

► BOX 15-6

Home Care Forms for Documentation

The usual forms used to document home care include the following:

- Assessment forms
- Referral source information or intake form
- Discipline-specific care plans
- Physician's plan of treatment
- Professional order form (e.g., MD, speech language pathologist, specialty nurses)
- Medication administration record
- Clinical progress notes
- Miscellaneous (case conference notes, professional communication forms, private billing forms, insurance company forms)
- Discharge summary

Adapted from Iyer, P. W., & Camp, N. H. (1999). *Nursing documentation: A nursing process approach*. St Louis, MO: Mosby.

► BOX 15-7

Components of Documentation in Long-Term Care

Section 1: The Health Care Record

The health care record includes the resident's name and medical number; date and time of admission; change in resident's condition; informed consent; note or discharge summary; incident reporting; monthly summary charting; and type of therapy and treatment time.

Section 2: Resident Assessments and Related Documents

This section consists of the admission record; preadmission assessment; admission assessment; assessment of risk for falls; skin assessment; bowel and bladder assessment; physical restraint assessment; record of self-administration of medication; nutrition assessment; and activities, recreation, or leisure interests.

Section 3: Other Records

Other records include drug therapy records, medication or treatment records, flow sheets or other graphic records, laboratory and special reports, consent forms, acknowledgements and notices, advance directives, and discharge or transfer records.

information can be automatically transferred to different reports. Computers can also help generate nursing care plans and document all facets of patient care.

Hand-held devices such as personal digital assistants also have the potential to increase nursing productivity by providing access to clinical and reference material, providing a means for decreasing medication errors, and reducing documentation time (Scordo et al., 2003). Nurses can document at the patient's bedside—at the point of care. **Point-of-care information systems** consist of hand-held devices such as personal digital assistants or computers that nurses bring to the patient's bedside.

Nursing Information Systems

A good information system supports the work you do. As a nurse, you need to be able to easily access a computer program, review the patient's medical history and new orders, and then go to the patient's bedside to conduct a comprehensive assessment. Once you have completed the assessment, you enter data into the computer terminal at the patient's bedside and develop a plan of care from the information gathered. Periodically, you will return to the computer to check on laboratory test results and document the therapies you administer. The computer screens and optional pop-up windows make it easy to locate information, enter and compare data, and make changes.

Nursing information systems have two basic designs. The nursing process design is the most traditional. It organizes documentation within well-established formats, such as admission and postoperative assessment, problem lists, care plans, discharge planning instructions, and intervention lists or notes. The nursing process design also includes formats for the following tasks:

- Generation of a nursing worklist that indicates routine scheduled activities related to the care of each patient
- Documentation of routine aspects of patient care, such as hygiene, positioning, fluid intake and output, wound care measures, and blood glucose measurements
- Progress note entries with the use of narrative notes, CBE, and flow sheet charting
- Documentation of medication administration

The second design model for a nursing information system is the protocol, or critical pathway, design (Hebda et al., 2005). This design offers a multidisciplinary format to managing information. All health care providers use a protocol system to document the care that they provide patients. Evidence-informed clinical protocols or critical pathways provide the formatting or design for the type of information that clinicians enter into the system. The information system allows a user to select one or more appropriate protocols for a patient. An advanced system merges multiple protocols so that a master protocol, or path, is used to direct patient care activities. The system identifies variances of the anticipated outcomes on the protocols as they are charted. This system provides all caregivers the ability to analyze variances and to obtain an accurate clinical picture of the patient's progress.

Advantages of a Nursing Information System. Few formal well-designed studies have demonstrated the impact of computerized record systems on nursing practice or patient outcomes. Anecdotal reports and descriptive studies suggest that nursing information systems do offer important advantages to nurses in practice. Hebda et al. (2005) outlined some specific advantages of nursing information systems:

- Increased time to spend with patients
- Better access to information
- Enhanced quality of documentation
- Reduced numbers of errors of omission
- Reduced hospital costs
- Increased nurse job satisfaction
- Enhanced compliance with accreditation standards
- Development of a common clinical database

Security Mechanisms. Computerized documentation has legal risks. Any given person could theoretically access a computer station within a health care agency and obtain information about almost any patient. Protection of privacy of information in computer systems is a top priority. As described in Chapter 16, Canada has both provincial and national privacy legislation to protect personal health information in electronic or other form.

In most security mechanisms for information systems, a combination of logical and physical restrictions is used to protect information and computer systems. These measures include the installation of firewalls, antivirus software, and spyware-detection software. A firewall is a combination of hardware and software that protects private network resources (e.g., a hospital's information system) from outside hackers, network damage, and theft or misuse of information. An example of a logical restriction is an automatic sign-off, a mechanism that logs a user off the computer system after a specified period of inactivity on the computer (Hebda et al., 2005).

Physical security measures include the placement of computers or file servers in restricted areas. This form of security may have limited benefit, especially if an organization uses mobile wireless devices such as notebooks, tablet personal computers, or personal digital assistants. Such devices can be easily misplaced or lost, which allows them to be accessed by unauthorized persons. An organization may use motion detectors or alarms with devices to help prevent theft.

One method of authenticating access to automated records is the use of access codes and passwords. A password is a collection of alphanumeric characters that a user types into the computer before he or she can access a program. A user is usually required to enter a password after the entry and acceptance of an access code or user name. A password does not appear on the computer screen when it is typed, nor should it be known to anyone but the user and information systems administrators (Hebda et al., 2005). Efficacious passwords contain combinations of letters, numbers, and symbols that are not easily guessed. When using a health care agency computer system, you must not share your computer password, under any circumstances, with anyone. A secure system requires frequent and random changes in personal passwords to prevent unauthorized persons from tampering with records. In addition, most staff members have access to patients in their work area only. Select staff members (e.g., administrators or risk managers) may be given authority to access all patient records.

Handling and Disposal of Information. It is important to keep medical records confidential, but it is equally important to safeguard the information that is printed from the record or extracted for report purposes. For example, you print a copy of a nursing activities worklist to use as a day planner while administering care to patients. You refer to information on the list and handwrite notes to enter later into the computer. Information on the list is considered to be personal health information and must be kept confidential and not left out for

view by unauthorized persons. You must destroy anything that is printed when the printed information is no longer needed.

All papers containing personal health information (e.g., patient's health care number, date of birth, age, name, or address) must be destroyed if they are not part of the patient's health record. Most agencies have shredders or locked receptacles for shredding and later incineration. Be sure you familiarize yourself with the disposal policies for records in the institution where you work.

Clinical Information Systems

Any clinician, including nurses, physicians, pharmacists, social workers, and therapists, will use programs available on a clinical information system. These programs include monitoring systems; order entry systems; and laboratory, radiology, and pharmacy systems. A monitoring system includes devices that automatically monitor and record biometric measurements (e.g., vital signs, oxygen saturation, cardiac index, and stroke volume) in critical care areas and specialty areas. The devices electronically send measurements directly to the nursing documentation systems.

Order entry systems enable nurses to order supplies and services from another department. Such systems eliminate the need for written order forms and expedite the delivery of needed supplies to a nursing unit. The **computerized physician order entry (CPOE)** is one type of order entry system gaining popularity in many larger hospitals. CPOE is a process by which the physician or nurse practitioner directly enters orders for patient care into the hospital information system. CPOE can eliminate the issues related to illegible handwriting and transcription errors, prevent duplication, and speed the implementation of ordered diagnostic tests and treatments. It can improve staff productivity and save money. Orders made through CPOE are integrated within the record and sent to the appropriate departments (e.g., pharmacy and radiology). In advanced systems, CPOE is linked to **clinical decision support**, which has a range of computerized tools such as built-in reminders and alerts that help the health care professional select the most appropriate medication or diagnostic test or remind the practitioner about drug interactions, allergies, and the need for subsequent orders. Medication errors and adverse drug-related events can potentially be reduced. Few studies have measured the effects of CPOE with clinical decision support on these variables, however, and more research (especially randomized controlled trials) in this area is needed (Wolfstadt et al., 2008).

The Electronic Health Record

The traditional paper health care record no longer meets the needs of today's health care industry. A paper record is episode oriented, with a separate record for each patient visit to a health care agency (Hebda et al., 2005). Key information can be lost from one episode of care to the next, which can jeopardize a patient's safety. An **electronic health record (EHR)** is a longitudinal record of patient health information accessible online from many separate but interoperable automated systems within an electronic network (Health Canada, 2005; see Chapter 16). A unique feature of an EHR is its ability to integrate all pertinent patient information into one record, regardless of the number of times a patient enters a health care system.

The development and implementation of an EHR to support effective health care delivery for Canadians is in progress through Canada Health Infoway, Inc. Infoway set a target of 50% of Canadians to have EHRs by 2010 and by December 2010, they had reached 49%. Canada is on schedule to providing EHRs to 100% of residents by 2016 (Canada Health Infoway, 2011).

Reporting

Nurses communicate information about patients so that all team members can make appropriate decisions about the care of patients. Any verbal report must be timely, accurate, and relevant. Many Canadian hospitals use the **situation-background-assessment-recommendation (SBAR) technique** or **identification-situation-background-assessment-recommendation-read back (I-SBAR-R) technique** (Box 15-8) to provide "a practical roadmap to succinct, important, but brief communication" between members of the health care team about a patient's care (Powell, 2007, p. 195). The SBAR/I-SBAR-R technique is a situational briefing system that fosters a culture of patient safety.

Nurses commonly make four types of reports: change-of-shift reports, telephone reports, transfer reports, and incident reports. The I-SBAR-R technique (see Box 15-8) can be incorporated into a variety of ways of reporting (e.g., a nurse's report to a physician about a critically ill patient, change-of-shift reports about individual patients) and can be adapted for use with or by other health care professionals.

Change-of-Shift Reports

At the end of each shift, nurses report information about their assigned patients to the nurses working on the next shift. There is an increasing awareness that high-quality handover practices are critical to ensure patient safety and continuity of care among nurses, but there is very little evidence for what constitutes best practice in change-of-shift reports (Riesenberg et al., 2010). Various terms are used to describe this exchange of information, such as change-of-shift reports, patient care handover, transfer of accountability, handoffs, bedside reporting, or shift handover.

Nurses give a **change-of-shift report** orally in person, by audiotape recording, by writing information on a summary report sheet, or during "walking-planning" rounds at each patient's bedside. Oral reports can be given in conference rooms, with staff members from both shifts participating. Oral reports can also take the form of one-to-one reports: for example, a report given by the night nurse to the day nurse. An advantage of oral reports is that they allow staff members to ask questions or clarify explanations. The nurses can see the patient together to perform needed assessments, evaluate progress, and discuss the interventions best suited to the patient's needs. An audiotape report is given by the nurse who has completed care for the patient; this type of report is left for the nurse on the next shift to review. However, it is essential to schedule an opportunity for the incoming nurses to ask questions for clarification after they listen to the taped report. According to Popovich (2011, p. 59), human factors such as "stress, distraction, and communication problems" make change-of-shift reports more prone to error. Several Canadian hospitals have implemented standardized bedside safe patient handoffs using **transfer of accountability (TOA)** practice guidelines developed by their institution. The process

► BOX 15-8

The Identification-Situation-Background-Assessment-Recommendation-Repeat Back (I-SBAR-R) Technique

When calling the physician, follow the I-SBAR-R process as follows:

Identification: Who is calling and who are you calling about?

- Identify yourself and your role
- Identify the unit, the patient, and the room number

Situation: What is the situation you are calling about?

- Briefly state the problem: What it is, when it started, and the severity

Background: Provide background information as necessary related to the situation, including the following:

- The admitting diagnosis, date of admission and pertinent medical history
- List of current medications, allergies, intravenous fluids, and laboratory tests
- Laboratory results (date and time each test was performed and results of previous tests for comparison)
- Other clinical information
- Code status

Assessment: What is your assessment of the situation?

Examples include the following:

- Most recent vital signs
- Changes in vital signs or assessment from previous assessments

Recommendations: What is your recommendation, or what do you think needs to be done?

Examples include the following:

- Patient to be admitted or transferred
- New medication or further tests
- Patient to be seen now
- Orders to be changed

Repeat Back:

- Repeat back orders that have been given
- Clarify any questions

Adapted from Joint Commission on Accreditation of Healthcare Organizations. (2005, February). The SBAR technique: Improves communication, enhances patient safety. *Joint Commission Perspectives on Patient Safety*, 5(2), 2; Enlow, M., Shanks, L., Guhde, J., & Perkins, M. (2010). Incorporating interprofessional communication skills (ISBARR) into an undergraduate nursing curriculum. *Nurse Educator*, 35(4), 176–180; and Grbach, W., Struth, D., & Vincent, I. (2007). *Reformulating SBAR to "I-SBAR-R"*. Chapel Hill, NC: Quality and Safety Education for Nurses. Retrieved from <http://www.qsen.org/teachingstrategy.php?id=33>.

provides an opportunity for “the off-going and the on-coming nurses [to] engage in a verbal report and [to] complete a patient safety checklist at the bedside” (Alvarado et al., 2006, p. 75).

Because nurses have many responsibilities, it is important to compile a change-of-shift report quickly and efficiently (Table 15-4). An effective report describes patients’ health status and tells staff on the next shift exactly what kind of care the patients require. A change-of-shift report should *not* simply be a reading of documented information. Instead, significant facts about patients are reviewed (e.g., condition of wounds, episodes of chest pain) to provide a baseline for comparison during the next shift. Data about patients need to be objective, current, and concise.

An organized report follows a logical sequence. The following is an example of a change-of-shift report:

► TABLE 15-4

Change-of-Shift Reports: Dos and Don'ts

Dos

Do provide only essential background information about patient (i.e., name, sex, age, physician's diagnosis, and medical history).

Do identify patient's nursing diagnoses or health care problems and their related causes.

Do describe objective measurements or observations about patient's condition and response to health problem, and emphasize recent changes.

Do share significant information about family members as it relates to patient's problems.

Do continuously review ongoing discharge plan (e.g., need for resources, patient's level of preparation to go home).

Do relay to staff significant changes in the way therapies are given (e.g., different position for pain relief, new medication).

Do describe instructions given in teaching plan and patient's response.

Do evaluate results of nursing or medical care measures (e.g., effect of back rub or analgesic administration), and describe results specifically.

Do be clear about priorities to which incoming staff must attend.

Don'ts

Don't review all routine care procedures or tasks (e.g., bathing, scheduled changes).

Don't review all biographical information already available in written form.

Don't use critical comments about patient's behaviour, such as “Mrs. Wills is so demanding.”

Don't make assumptions about relationships between family members.

Don't wait till near discharge to discuss the plan.

Don't describe basic steps of a procedure.

Don't explain detailed content unless staff members ask for clarification.

Don't simply describe results as “good” or “poor.”

Don't force incoming staff to guess what to do first.

Background information: Cy Tolan in bed 4, a 32-year-old patient of Dr. Lang, is scheduled for a colon resection this morning at 0800 hours. He has had ulcerative colitis for two years with recent bouts of frank bleeding in his stools. He was admitted at 0600 hours this morning with slight abdominal discomfort. This is his first experience with surgery. He knows he may require a colostomy. He has been NPO (had nothing by mouth) since midnight at home.

Assessment: Mr. Tolan mentioned that he was unable to sleep last night. He had many questions about surgery on admission this morning.

Nursing diagnosis: His chief nursing care problems are anxiety related to inexperience with surgery and risk for body image disturbance.

Teaching plan: I talked to him about postoperative routines and answered all his questions. He attended the preoperative admission clinic two weeks ago, but he did not have as many concerns at that time. He stated that he felt less anxious now that he knows what to expect.

Treatments: I started an intravenous infusion of normal saline in his left arm at 0645 hrs and it is running at 125 mL/hr.

Family information: His wife came with him this morning and will wait in the surgical waiting room till his surgery is complete.

Discharge plan: Mr. Tolan is a very active person and participates in strenuous sports such as swimming. Mrs. Tolan is concerned about how he might react to a colostomy. I suggest making a referral to the enterostomal therapist early, if the colostomy is performed.

Priority needs: Right now, Mr. Tolan is relaxing in his room. All preoperative procedures have been completed except for his preoperative antibiotic, due on call to the operating room.

A professional demeanour is essential when you give a report about patients or family members. It is often necessary to describe the interactions among patients, nurses, and family members in behavioural terms. Nurses must avoid using judgemental language such as *uncooperative*, *difficult*, or *bad* when describing such behaviours.

In many settings, unregulated care providers (UCPs) are involved in the change-of-shift report. UCPs are part of the health care team and can contribute more when they also know a patient's condition and the nursing team's priorities in care. The nurse can use the report to emphasize to UCPs the tasks that need to be accomplished.

Telephone Reports

Nurses inform physicians of changes in a patient's condition and communicate information to nurses on other units about patient transfer. The laboratory staff or a radiologist may phone to report results of diagnostic tests. Telephone reports should provide clear, accurate, and concise information. Information in a telephone report is documented when significant events or changes in a patient's condition have occurred. In documenting a phone call, the nurse includes information about when the call was made, who made it (if other than the writer of the information), who was called, to whom information was given, what information was given, and what information was received. An example is as follows: "At 1005 hrs called Dr. Morgan's office; S. Thomas, RN, was informed that Mr. Rush's stat potassium level drawn at 0800 hrs was 3.2. C. Skala, RN."

Telephone or Verbal Orders

A telephone order (often written "TO") involves a physician stating a prescribed therapy over the phone to a registered nurse. A verbal order (often written "VO") may be accepted when the physician has no opportunity to write the order, as in emergency situations. Clarifying for accuracy is important when you accept a physician's orders over the telephone or verbally. You need to verify the order by repeating it clearly and precisely. You are responsible for writing the order on the physician's order sheet in the patient's permanent record and signing it. An example is as follows: "1/16/2010, 1920 hrs: acetaminophen 325 mg PO [orally] 2 tabs now and q4h [every four hours] prn [as needed]. TO Dr. Reiss/Carol Skala, RN." The physician later verifies the telephone order legally by

BOX 15-9

Guidelines for Telephone Orders and Verbal Orders

- Clearly determine the patient's name, room number, and diagnosis.
- Repeat any orders back to the prescribing physician.
- Ask for clarification to avoid misunderstandings.
- Write telephone order ("TO") or verbal order ("VO"), including date and time, name of patient, and the complete order, and sign the names of the physician and nurse.
- Follow agency policies; some institutions require telephone (and verbal) orders to be reviewed and signed by two nurses.
- The physician must co-sign the order within the time frame required by the institution (usually 24 hours).

signing it within a set time period (e.g., 24 hours). Many telephone orders are given at night or during an emergency and need to be used only when absolutely necessary. In some situations, it may be prudent to have a second person listen to telephone orders. Box 15-9 provides guidelines that can be used to prevent errors when receiving telephone orders and verbal orders.

Transfer Reports

Patients may transfer from one unit to another to receive different levels of care. For example, patients transfer from an intensive care unit or the recovery room to general nursing units when they no longer require intense monitoring. To promote continuity of care, you may give **transfer reports** by phone or in person. When giving a transfer report, you need to include the following information:

- Patient's name, age, name of primary physician, and medical diagnosis
- Summary of progress up to the time of transfer
- Patient's current health status (physical and psychosocial)
- Patient's allergies
- Patient's emergency code status
- Patient's family support (e.g., spouse or partner, children, parents)
- Patient's current nursing diagnoses or problem and care plan
- Any critical assessments or interventions to be completed shortly after transfer (helps receiving nurse to establish priorities of care)
- Need for any special equipment, such as isolation equipment, suction equipment, or traction

After completion of the transfer report, the receiving nurse needs an opportunity to ask questions about the patient's status. In some cases, written documentation must include a record of information reported.

Incident Reports

An incident is any event that is not consistent with the routine operation of a health care unit or routine care of a patient. Examples of incidents include patient falls, needle-stick injuries, a visit by someone who has symptoms of illness, medication administration errors, accidental omission of ordered therapies, and circumstances that led to injury or risk for patient injury. Analysis of **incident reports** (also known as *adverse occurrence reports*) helps with the identification of trends in systems and unit operations that justify changes in policies and procedures or the scheduling of in-service seminars.

Incident reports are an important part of a unit's quality improvement program and should not be used for punitive purposes (see Chapter 10).

✦ KEY CONCEPTS

- The health care record is a legal document and requires information describing the care that is delivered to a patient.
- All information pertaining to a patient's health care management that is gathered by examination, observation, or conversation or as a result of treatment is confidential.
- Multidisciplinary communication is essential within the health care team.
- Accurate record keeping requires an objective interpretation of data with precise measurements, correct spelling, and proper use of abbreviations.
- A nurse's signature on an entry in a record designates that particular nurse's accountability for the contents of that entry.
- Any change in a patient's condition warrants immediate documentation to keep a record accurate.
- Problem-oriented health care records are organized by the patient's health care problems.
- The intent of SOAP, SOAPIE, PIE, and DAR charting is to organize entries in the progress notes according to the nursing process.
- Critical pathways or care maps provide members of the health care team with a way to document their contributions to the patient's total plan of care.
- Home care documentation is accessible to a variety of caregivers in the home.
- Long-term care documentation is multidisciplinary. Assessments performed several times a day in the acute care setting are required only weekly or monthly in long-term care.
- Computerized information systems contain information about patients that is organized and easily accessible.
- Protection of the confidentiality of patient health information and the security of computer systems should be a top priority.
- The major purpose of the change-of-shift report is to maintain continuity of care.
- When information pertinent to care is communicated by telephone or verbally, the information needs to be verified.
- Incident reports objectively describe any event that is not consistent with the routine care of a patient.

✦ CRITICAL THINKING EXERCISES

1. Joseph Vojnovic is an 80-year-old man admitted with a diagnosis of possible pneumonia. He complains of general malaise and a frequent productive cough, worse at night. Vital sign measurements are as follows: blood pressure, 150/90 mm Hg; pulse rate, 92 beats per minute; respiration rate, 22 breaths per minute; and temperature, 38.5°C. During your initial assessment, he coughs violently for 40 to 45 seconds without expectorating. He exhibits wheezes and coarse crackles at both bases of the lungs. He states, "It hurts in my chest when I cough." Differentiate between objective and subjective data in this case example.
2. The nurse positions Mr. Vojnovic in a semi-Fowler's position, encourages him to increase his fluid intake, and gives him acetaminophen (Tylenol), 650 mg PO, as ordered for fever. One hour later, his vital sign measurements are as follows: blood pressure, 130/86 mm Hg; pulse, 86 beats per minute; respiration rate, 22 breaths per minute; and temperature, 37.7°C. He states that he has been able to sleep. His fluid

intake over the past hour has been 200 mL of water. Use the given information to write a nurse's progress note using the PIE format.

3. Near the end of your shift, you have identified *fluid volume deficit* as a nursing diagnosis for Mr. Vojnovic. Since his admission, he has had a fluid intake of about 600 mL, and his urine output was 300 mL of dark, concentrated urine. His temperature is back up to 38.4°C, his mucous membranes are dry, and he states that he feels very weak. List what should be included in the change-of-shift report.
4. Several days later, after treatment with intravenous antibiotics, Mr. Vojnovic is feeling much better, and preparations are being made for discharge. He is to take cephalexin (Keflex) 500 mg every six hours, for the next 10 days; continue to drink extra fluids; and get extra rest. He lives alone. Although he is generally cooperative, he does not like drinking water or taking pills. He is to make an appointment with his physician for one week from today and should call the physician if symptoms recur. Write a discharge summary that is concise and instructive.

✦ REVIEW QUESTIONS

1. A fellow nursing student is a patient in the hospital where you have your clinical placement. You became aware of his admission when you transferred your own patient to his unit today. What should you do?
 1. Keep the information to yourself.
 2. Advise a few of his friends so that they can visit him.
 3. Visit him on his unit during your lunch break.
 4. Access his EHR to see if he is well enough for you to visit.
2. A manager is reviewing the nurses' notes in a community patient's health care record. She finds the following entry, "Patient is difficult to care for, refuses advice for improving appetite." Which of the following suggestions should the manager give to the community health nurse who entered the note?
 1. Avoid rushing when charting an entry.
 2. Use correction fluid to remove the entry.
 3. Draw a single line through the statement and initial it.
 4. Enter only objective and factual information about the patient.
3. A patient tells the nurse, "I have stomach cramps and feel nauseated." This is an example of which type of data?
 1. Objective
 2. Historical
 3. Subjective
 4. Assessment
4. During your visit to a patient's home, your patient says, "I do not know what is going on; I cannot get an explanation from my doctor about the results of my test. I want something done about this." Which of the following is the most appropriate documentation of the patient's emotional status?
 1. The patient has a defiant attitude and demands his test results.
 2. The patient appears to be upset with his physician about his test results.
 3. The patient is demanding and complains frequently.
 4. The patient states he is frustrated by the lack of information about his test results.

5. Patients frequently request copies of their health care records. Which of the following statements is true regarding patient access to health care records?
 1. Patients have the right to read those records.
 2. Patients are not allowed to read those records.
 3. Only the health care workers have access to the records.
 4. Only the families may read the records.
6. Accurate entries are an important characteristic of good documentation. Which of the following charting entries is most accurately written?
 1. Patient ambulated in hall with assistance, exercise well tolerated.
 2. Patient ambulated 15 m (50 feet) up and down hall, exercise well tolerated.
 3. Patient ambulated 15 m (50 feet) up and down hall with assistance from nurse.
 4. Patient ambulated 15 m (50 feet) with assistance from nurse. Pre-exercise HR 88; postexercise HR 94.
7. What is the purpose of acuity records?
 1. To guide all nursing care
 2. To document the patient admission
 3. To determine hours of care needed
 4. To establish guidelines for patient care
8. Match the correct numbered entry with the appropriate SOAP category.

S	1. Repositioned patient on right side. Encouraged patient to use patient-controlled analgesia.
O	2. "The pain increases every time I try to turn on my left side."
A	3. Acute pain related to tissue injury from surgical incision.
P	4. Left lower abdominal surgical incision, 3 inches (7.5 cm) in length, closed, sutures intact, no drainage. Pain noted on mild palpation.

❖ RECOMMENDED WEB SITES

Accreditation Canada: <http://www.accreditation.ca/en/>

Accreditation Canada is a national, nonprofit, independent organization whose role is to help health and social service organizations, across Canada and internationally, examine and improve the quality of care and service they provide to their patients through a voluntary external peer review.

Canada Health Infoway: <http://www.infoway-inforoute.ca>

Canada Health Infoway (Infoway) is a federally funded, independent, not-for-profit organization. Members include the 14 federal, provincial, and territorial deputy ministers of health. Infoway has a mandate to foster and accelerate the development and adoption of electronic health information systems and EHRs across Canada.

Canadian Nurses Association: Provincial and Territorial Regulatory Bodies: <http://www.cna-aic.ca/en/becoming-an-rn/regulation-of-rns/regulatory-bodies/>

This part of the Web site of the Canadian Nurses Association provides links to each provincial and territorial nursing association. Most associations provide information about documentation standards and requirements in their province or territory.

Canadian Nursing Informatics Association: <http://cnia.ca/>

The Canadian Nursing Informatics Association (CNIA) is affiliated with the Canadian Nurses Association and has been established as the voice for health informatics in Canada. *Nursing informatics* refers to the integration of nursing science, computer science, and information science to document and communicate data and knowledge in nursing practice.

Review Question Answers

1. 1; 2. 4; 3. 3; 4. 4; 5. 1; 6. 4; 7. 3; 8. S=2; O=4; A=3; P=1

Rationales for the Review Questions appear at the end of the book.

Nursing Informatics and Canadian Nursing Practice

Written by Kathryn J. Hannah, RN, PhD, and Margaret Ann Kennedy, RN, PhD, CPHIMS-CA

objectives

Mastery of content in this chapter will enable you to:

- Define the key terms listed.
- Differentiate how nursing informatics differs from routine use of technologies in nursing practice.
- Identify key Canadian issues and challenges in managing nursing data.
- Identify and compare Canadian strategies for identifying and documenting key nursing data.
- Discuss how health information data standards influence Canadian nursing practice.
- Discuss why using standardized nursing data is important for acknowledging the professional contributions of nursing to health outcomes of Canadians.
- Develop a beginning understanding of the scope of nursing informatics concepts and the ways in which nurses can be involved in nursing informatics.
- Discuss the relationship between national privacy legislation and nursing practice in a digital practice environment.
- Discuss how the Canadian Nurses Association's national *e-Nursing Strategy* will influence current and future nursing practice.

media resources

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- Audio Chapter Summaries
- Examination Review Questions
- Glossary
- Weblinks

key terms

American Medical Informatics Association (AMIA), p. 240	International Classification for Nursing Practice® (ICNP®), p. 233
C-HOBIC (Canadian Health Outcomes for Better Information and Care) Project, p. 236	International Health Terminology Standards Development Organization (IHTSDO), p. 234
Canada Health Infoway, p. 231	International Medical Informatics Association (IMIA), p. 240
Canadian Nursing Informatics Association (CNIA), p. 239	International Medical Informatics Association-Special Interest Group in Nursing Informatics (IMIA-SIGNI), p. 239
Canadian Organization for Advancement of Computers in Health (COACH), p. 229	Nursing informatics (NI), p. 229
Canadian Institute for Health Information (CIHI), p. 229	Personal Information Protection and Electronic Documents Act (PIPEDA), p. 236
Electronic health record (EHR), p. 229	SNOMED CT® (Systematized Nomenclature of Medicine Clinical Terms®), p. 233
Health Information: Nursing Components (HI:NC), p. 233	Standard, p. 231
HOBIC (Health Outcomes for Better Information and Care) Project, p. 236	
International Council of Nurses (ICN), p. 233	

As health care systems respond to an increasingly complex technological environment, long-standing routines and tools are being superseded by strategic, evidence-informed practices that demand high-quality, timely health information. In an era when complex health care is delivered by dynamic multidisciplinary teams, effective nursing documentation is critical to support clinical judgment and decision making, as well as to support aggregation with documentation from other nurses and clinical disciplines to support optimal patient outcomes. Current information needs in health care

challenge nurses to identify the elements of their practice that are most critical for use in nursing decision making. **Nursing informatics (NI)**, a specialty area of nursing practice dedicated to optimal use of technology to support professional practice and enable optimal patient outcomes, has responded to this challenge and continues to support the progression of the effective use of information in nursing practice and documentation.

Hannah et al. (2006) tracked the evolution of technology in health care, noting that since its introduction in the health care sector, nursing has recognized the value of information and communications technology (ICT) to inform effective practice and has fostered technological development in support of patient care. Current ICT applications in health care include patient scheduling and transfer, billing and financial management, diagnostic imaging, lab reporting, order entry applications, pharmacy, patient documentation systems, clinical support tools, remote consultation and triage, as well as resource management applications. Developers of health care software solutions offer integrated suites of applications that incorporate multiple tools for health care facilities or regions, and many health care institutions customize software to meet specific needs. Efforts are underway in every Canadian province and territory to develop a jurisdictional **electronic health record (EHR)**—a longitudinal record of an individual's health status (including diagnosed morbid conditions), diagnostic tests, treatments, and results—that will be interoperable with a pan-Canadian EHR. This movement toward provincial and national EHRs requires that developers or vendors incorporate into their information systems the capacity for interoperability with other vendors' systems in order to provide the ability for patient information to be communicated along with the patients as they move across all sectors of the regional, provincial, or national health care delivery system.

However, in spite of the vast array of technologies currently available in health care, nurses must continue to contextualize technology within the scope of their professional practice. For example, Hannah (2005, p. 48) notes that “the issues for nurses are no longer computers or management information systems, but rather information and information management. The computer and its associated software are merely tools to support nurses as they practice their profession.”

Nursing Informatics and the Canadian Health Care System

As nurse leaders witnessed the technology explosion, pioneers in nursing informatics recognized that nursing needed to be strategic regarding the adoption of technology to support professional practice, and assess how nurses could respond to the demands related to using such technology. The term *nursing informatics (NI)* was introduced initially by Dr. Marion Ball at the 1983 International Medical Informatics Association (IMIA) Conference in Amsterdam (Hannah et al., 2006). In the 1980s, NI emerged as a new nursing specialty in health information management. Since the first text devoted to nursing informatics, by Ball and Hannah in 1984, journals and texts have proliferated across Canada and internationally. Hannah et al. (2006) noted that, despite the escalation of technology in health care and the recognition of NI, the persistent absence of universally accepted methods for defining and coding nursing contributions to health outcomes is a significant obstacle to the collection of nursing data.

Defining Nursing Informatics

As research, education, and practice continue to inform NI, and NI continues to advance, definitions have correspondingly evolved. Early definitions focused on technology and effective utilization in practice, while current definitions focus more on the role of information management and the role of the nurse as an information manager. Table 16-1 presents an overview summary of definitions, reflecting the progression in the understanding of NI and the concurrent evolution of definitions (Staggers & Bagley Thompson, 2002).

Evolution of Informatics in the Canadian Health Care System

The events occurring over the last 30 years have culminated in national attention to the need for timely, secure, and appropriate health information access. Multiple health care and standards development organizations operate to coordinate broad documentation of health information and monitoring of the Canadian health care system. It is essential that you have both an awareness and an understanding of the roles and relevance of each of these entities in relation to your nursing practice.

Health informatics encompasses all health care disciplines, and the unique application of informatics knowledge and skills reflects specialties such as medical informatics, nursing informatics, and dental informatics. The **Canadian Organization for Advancement of Computers in Health (COACH)**, Canada's health informatics association, defines health informatics as the “intersection of clinical, IM/IT [Information Management/Information Technology] and management practices to achieve better health” (COACH, 2009, p. 7). The recognition of health informatics occurred over many years as the result of dedicated efforts of many professionals. Although this chapter recognizes the existence of other types of informatics practices, the focus will remain on nursing informatics.

From the mid-1980s onward, Canada's health information infrastructure experienced numerous evolutions and reconfigurations, all of which had significant implications for nursing. The 1989 Canadian merger between the National Hospital Productivity Improvement Program and the Management Information System Project, which led to the Management Information System (MIS) Group, was an important event in Canadian health care information management (Hannah et al., 2006). The MIS Group, according to Hannah et al. (2006), developed guidelines on the collection of data for demographic, statistical, and resource utilization and consumption purposes. The problem with the MIS data is that, like hospital discharge summaries, this health information was restricted to physician-driven data and contained no clinical nursing data elements. Hannah et al. (2006, p. 89) made the point that “noteworthy, again, is the *total absence* of clinical nursing data.”

The Wilk Report (National Task Force on Health Information, 1991) had a significant effect on Canadian health information, triggering the 1993 merger of the Management Information System Group, Hospital Medical Records Institute, portions of Statistics Canada, and Health and Welfare Canada to create the **Canadian Institute for Health Information (CIHI)** (Hannah, 2005). CIHI is the national, independent, and not-for-profit body that records, analyzes, and disseminates essential data and analysis on Canada's health system and the health of Canadians (CIHI, 2011). Although not initially attentive to nursing data, this institution later became more important to

► **TABLE 16-1** Evolution of Nursing Informatics Definitions

Focus of Definition	Date	Author	Definition
Information technology	1984; 1994	Ball & Hannah (p. 181); Hannah et al. (p. 5)	"any use of information technologies by nurses in relation to the care of their patients, the administration of health care facilities, or the educational preparation of individuals to practise the discipline is considered nursing informatics"
	1986	Saba & McCormick (p. 116)	"systems that use computers to process nursing data into information to support all types of nursing activities"
	1989	Zeilstorff et al.	Central role of technology
	1996	Saba & McCormick (p. 226)	"use of technology and/or a computer system to collect, store, process, display, retrieve, and communicate timely data and information in and across health care facilities that administer nursing services and resources, manage the delivery of patient and nursing care, link research resources and findings to nursing practice, and apply educational resources to nursing education"
	1998	International Medical Informatics Association (IMIA; http://www.imia.org)	"the integration of nursing, its information, and information management with information processing and communication technology, to support the health of people worldwide"
	2000	Ball et al. (p. 10)	"all aspects of nursing—clinical practice, administration, research and education—just as computing holds the power to integrate all four aspects"
	2001	Canadian Nurses Association (http://www2.cna-aic.ca/CNA/documents/pdf/publications/NursingInformaticsSept_2001_e.pdf)	"the application of computer science and information science to nursing. NI promotes the generation, management and processing of relevant data in order to use information and develop knowledge that supports nursing in all practice domains"
Conceptual	1986	Schwirian (p. 134)	"solid foundation of nursing informatics knowledge [that] should have focus, direction, and cumulative properties"
	1989	Graves & Corcoran (p. 227)	A combination of computer science, information science, and nursing science designed to assist in the management and processing of nursing data, information, and knowledge to support the practice of nursing and the delivery of nursing care
	1996	Turley	Development of a NI model that included cognitive science, information science, and computer science
Role centred	1992	American Nurses Association (ANA) Council on Computer Applications in Nursing (p. 1)	"specialty that integrates nursing science, computer science, and information science in identifying, collecting, processing, and managing data and information to support nursing practice, administration, education, and research and to expand nursing knowledge. The purpose of nursing informatics is to analyze information requirements; design, implement and evaluate information systems and data structures that support nursing; and identify and apply computer technologies for nursing"
	1994	ANA (p. 1)	"specialty that integrates nursing science, computer science, and information science in identifying, collecting, processing, and managing data and information to support nursing practice, administration, education, research, and expansion of nursing knowledge. It supports the practice of all nursing specialties, in all sites and settings, whether at the basic or advanced level. The practice includes the development of applications, tools, processes, and structures that assist nurses with the management of data in taking care of patients or in supporting their practice of nursing"

▶ TABLE 16-1 Evolution of Nursing Informatics Definitions—cont'd

Focus of Definition	Date	Author	Definition
	2002	Staggers & Bagley-Thompson (p. 260)	Nursing informatics is a specialty that integrates nursing science, computer science, and information science to manage and communicate data, information, and knowledge in nursing practice. Nursing informatics facilitates the integration of data, information, and knowledge to support patients, nurses, and other providers in their decision making in all roles and settings. This support is accomplished through the use of information structures, information processes, and information technology.
	2009	International Medical Informatics Association—Nursing Informatics (IMIA-NI)	Nursing informatics science and practice integrates nursing, its information and knowledge and their management with information and communication technologies to promote the health of people, families, and communities globally.

several issues directly influencing nursing, including issues related to nursing workforce recruitment and retention.

In response to recommendations issued by the National Forum on Health for a pan-Canadian electronic health record, the federal government committed an initial \$500 million to the development of e-health, which included the EHR, telehealth, and Internet-based health information (Canadian Nurses Association [CNA], 2006b; Hannah, 2005). **Canada Health Infoway** (Infoway), incorporated in 2001, was a key outcome of the federal, provincial, and territorial partnership (CNA, 2006a). Infoway has a national mandate to generate consensus on health information standards, to drive the national agenda of creating an EHR system, and to act as the liaison to international standards development organizations (Canada Health Infoway, 2012). Infoway fulfills this mandate by partnering with jurisdictions as a “strategic investor” to share costs of implementing health information management projects and provides additional project benefits analysis. Since 2001, the federal government has allocated \$2.1 billion to Infoway to support the development of electronic health records in Canada (Canada Health Infoway, 2012).

Six core components make up an EHR (Canada Health Infoway, 2012):

- Patient registry
- Provider registry
- Diagnostic images
- Laboratory results
- Drugs dispensed
- Clinical reports/immunization

To date, nine jurisdictions in Canada have at least four of these components in place, while the other jurisdictions are in various stages of implementation (Canada Health Infoway, 2012). Additional information about the EHR is available at <https://www.infoway-inforoute.ca/>.

Since its inception, Infoway has approved allocation of more than \$2 billion, or 96.8% of its total funding, across all its program areas (Canada Health Infoway, 2012, p. 22). To date, Infoway has committed more than \$953.5 million to various provincial and territorial projects and programs, resulting in more than 371 projects in various stages of evolution ranging from planning to near completion (Canada Health Infoway,

2012). See Figure 16-1 for the status of jurisdictional progress on establishing the components of EHRs.

Projects vary in nature—telehealth, registries, picture archiving and communication systems (PACS), and lab and drug information systems—all enabling a faster response time between assessment and treatment. Every province and territory in Canada is engaged in advancing the implementation of EHRs, and, with investment from Infoway, they are making progress toward providing this service to Canadians.

Standards in Health Informatics

Standards in health care data management refer to a nationally or internationally agreed-upon protocol for representing all types of health information, including types of care provided, location of care provision, pharmacy ordering and dispensing, and billing messages. Standards ensure that data are consistently represented and exchanged and thus consistently *understood* by practitioners and health information systems. This consistent understanding and interpretation of health data contribute to the provision of quality care as well as increasing patient safety.

Infoway (2012) notes that standards ensure interoperability by supporting information exchange and identifies standards as a critical foundation for the interoperable electronic health record (iEHR). Canada Health Infoway (2012, p. 5) demonstrates how “standards support integrated, patient-centric health records enabling a longitudinal view of an individual’s key health history and care ... and that this critical information can be updated, managed, shared and interpreted in a meaningful secure way, when and where required.” Additional benefits of standards to various stakeholder groups are identified in Box 16-1.

In 2006, Infoway launched the Standards Collaborative, which is a “Canada-wide coordination function created to support and sustain health information standards in Canada” (Canada Health Infoway, 2008, p. 4). The global mandate for the Standards Collaborative was endorsed by the federal, provincial, and territorial Ministries of Health to coordinate support for development, implementation, testing, and maintenance of standards, and education for

	Client Registry	Provider Registry	Diagnostic Imaging	Drug Information Systems	Laboratory Information Systems	Clinical Reports
BC						
AB			(+)		(+)	
SK	(+)				(+)	
MB						
ON				(+)		
QC						
NB						
NS		(+)			(-)	
PE						
NL					(+)	(+)
YK						
NT						(+)
NU						

■ Conformant ■ Indicated commitment
■ Partially conformant ■ Solution development pre-dates pan-Canadian standards
■ Implementation in progress ■ Not applicable

Figure 16-1 Progress Update on Jurisdictional Storage of Health Data **Source:** Canada Health Infoway. (2012). *Annual report 2011–2012* (p. 12, Figure 8). Retrieved from <https://www.infoway-inforoute.ca/index.php/resources/infoway-corporate/annual-reports?view=docman>.

► BOX 16-1 Benefits of Standards for Stakeholder Groups

Stakeholder Group	Benefits of Standards in Health Care Data
Patients	• Reduced repetition of health information • Accessible personal health history • Improved coordination of care • Reduced duplication of tests and procedures • Improved health outcomes
Providers	• Timely access to health data • Availability of more reliable health information • Reduced duplication of efforts • Shorter response time between assessment and treatment • Improved quality and consistency of care resulting from enhanced information access • Enhanced patient outcomes
Service delivery organizations	• Reuse of solutions, benefiting from lessons learned and change management strategies • Greater breadth of data to use for evaluating outcomes • Enhanced ability to work collaboratively with other organizations or jurisdictions
Educators	• Increased confidence in products when determining suitability for use • Support for curriculum design that is aligned with accreditation process • Increased value of data for educational purposes • Enabling of educators and students to understand the health informatics environment at early stages of education
Researchers	• Enhanced ability to extract data, such as best practice guidelines, from published sources • Availability of higher-quality data • Reduced time to prepare data for use • Comprehensive data sets • Improved ability to monitor and assess health outcomes and determinants

Adapted from Canada Health Infoway. (2010). *Standards collaborative guide* (p. 7). Retrieved from https://www.infoway-inforoute.ca/flash/lang-en/scguide/docs/StandardsCatalogue_en.pdf.

both general and specific user groups (Canada Health Infoway, 2010, 2008).

The Standards Collaborative also incorporates nine Standards Collaborative Working Groups (SCWGs), in which clinicians, information technology experts, academics, researchers,

and policymakers collaborate to address standards development for health information and information systems in Canada. Membership in these groups is voluntary and open to any individual with an interest in contributing to the development of a specific aspect of EHRs.

Nurses are critical contributors to standards both in Canada and internationally. As a beginning practitioner, you need to be aware of the reasons you should participate; think of what the value is to you professionally and to the nursing profession to have nurses actively contributing and your role in contributing to the development and adoption of meaningful standards.

Standards Development in Canada

Canada is unique in providing a centralized access point for the development, use, and maintenance of health information standards. The Standards Collaborative provides support for domestic health information standards, international standards that are adopted for Canadian use, related services and customized education opportunities, maintenance and terminology services, implementation support, and the international Standards Development Organization (SDO) liaison on behalf of Canada.

The Standards Collaborative establishes pan-Canadian standards to support interoperability and promotes pan-Canadian consensus by leveraging and harmonizing the efforts of the federal, provincial, and territorial jurisdictions, health care providers, vendors, academics, and a comprehensive range of Canadian agencies and associations (Canada Health Infoway, 2012). As of 2011, standards supporting all six key components of the Electronic Health Record Solution (EHRS) and the EHRS Blueprint have been developed in Canada (Canada Health Infoway, 2012, p. 5). In addition to the standards established by the Standards Collaborative, access to international standards is also facilitated.

There are a number of ways in which **standards** play a role in shaping health care data. Standards support both *technical needs* regarding consistent communication of health data and *business needs* regarding actual clinical work processes—for example, a gap may be identified where we need to consistently describe a particular condition or clinical situation. Clinical terminology standards such as **SNOMED CT**® (Systematized Nomenclature of MEDicine Clinical Terms®) and others influence how we document clinical practice and access health data.

Standardizing Nursing Language

A widely held perception among many nurses is that nursing, as a professional practice, is generally considered invisible in regards to formal and tangible recognition (Clark, 1999; Clark & Lang, 1992; CNA, 2000; Hannah et al., 2006; Marck, 1994; Norwood, 2001; Powers, 2001; Weyrauch, 2002). Clark (1999, p. 42) observed that, in spite of representing the largest group of health care clinicians, nursing was invisible in health policy decisions, in descriptions of health care, in contracts, and in service specifications.

Clark and Lang (1992, p. 109), in their assessment of the invisibility of nursing, noted that nurses cannot control what cannot be named, stating “If we cannot name it, we cannot control it, finance it, teach it, research it, or put it into public policy.” The stance put forward by Clark and Lang (1992) and other seminal works (such as Graves & Corcoran, 1989, and Werley, 1988) argues that in order to give nursing visibility, it requires a standardized language to reflect what nursing is and what nursing does. Clark (1999) advocated a standardized nursing language, using the argument that “without a language to express our concepts we cannot know whether our understanding of their meaning is the same, so we cannot

communicate them with any precision to other people” (Clark 1999, p. 42). More recently, the argument has shifted from the issue of visibility to the value and necessity for patient safety and accountability along with accurate data for health system and clinical evaluation. Adopting a standardized nursing language has never been a more urgent issue, as the pan-Canadian iEHR moves forward and information management further enables evidence-based practice.

Health Information: Nursing Components

Before a standard nursing language is adopted, it is necessary to identify the most important data elements required for effective nursing decision making and evaluation. The minimum number of essential nursing data elements are referred to as a *minimum nursing data set*. In Canada, the process of working toward capturing nursing data was led by the Alberta Association of Registered Nurses (AARN) in 1992. This provincial nursing body, in conjunction with the Canadian Nurses Association, hosted a national conference focused on generating and validating a Canadian nursing minimum data set (NMDS) (Giovannetti et al., 1999). The nursing components of health information, the Canadian version of an NMDS, is known as **Health Information: Nursing Components (HI:NC)**. Since 1992, there has been consensus among Canadian nurses that HI:NC comprises five categories of elements: patient status, nursing interventions, patient outcomes, nursing resource intensity, and primary nurse identifier (AARN, 1994; CNA, 2000, 2001b). The Canadian Nurses Association describes HI:NC as the “most important pieces of data about the nursing care provided to the client during a health care episode” (2000, p. 5). Table 16-2 presents the HI:NC definitions.

Chapter 15 provides an overview of computerized nursing documentation. Many clinical information systems incorporate the HI:NC into the architecture or design of the nursing system. This enables capture of the most significant data reflective of the nursing contribution to patient care. Many versions of computerized nursing documentation systems continue to evolve and rely on the underlying philosophy of documentation to support design. For example, many systems do not encourage narrative documentation but provide checklists of common activities and encourage exception charting. Please review Chapter 15 for additional discussion of this issue.

International Classification for Nursing Practice®

In 2001, CNA endorsed the **International Classification for Nursing Practice® (ICNP®)** “for use in Canada as a foundational classification system for nursing practice in Canada” (CNA, 2001a). This endorsement was renewed in 2006 (CNA, 2006b). ICNP® was developed by the **International Council of Nurses (ICN)** in response to concerns regarding the visibility of nursing contributions in health care and calls for standardization of nursing data for comparability and analysis, as well as evidence-based practice. ICN proposed the use of a single unified terminology to represent nursing practice. The goals were to capture nursing practice across practice settings, cultures or languages, and geographical settings, as well as to ensure that professionals who used this new terminology could communicate with the numerous nursing terminologies already in use. Initially endorsed for development in 1989 by resolution at the ICN 19th Quadrennial Conference (ICN, 2009), the Alpha version of the International Classification for Nursing Practice® (ICNP®) was released in 1995. Version 1.0 was released in 2005 and is substantively different from

► TABLE 16-2

Health Information: Nursing Components

Nursing Component

Definition

Patient status	A label for the set of indicators that reflect the phenomena for which nurses provide care, relative to the health status of patients (McGee, 1993). Although patient status is similar to nursing diagnosis, the term <i>patient status</i> is preferred because it represents a broader spectrum of health and illness. The common label <i>patient status</i> is inclusive of input from all disciplines. The summative statements referring to the phenomena for which nurses provide care (i.e., nursing diagnosis) are merely one aspect of patient status at a point in time, in the same way as medical diagnosis.
Nursing interventions	Purposeful and deliberate health-affecting interventions (direct and indirect), based on assessment of patient status, which are designed to bring about results that benefit patients (Alberta Association of Registered Nurses [AARN], 1994).
Patient outcome	The "clients' status at a defined point(s) following health care [affecting] intervention" (Marek & Lang, 1993). It is influenced to varying degrees by the interventions of all care providers.
Nursing intensity	"Refers to the amount and type of nursing resource used to [provide] care" (O'Brien-Pallas & Giovannetti, 1993)
Primary Nurse Identifier	A single, unique, lifetime identification number for each individual nurse. This identifier is independent of geographic location (province or territory), practice sector (e.g., acute care, community care, public health) or employer.

Source: Hannah, K. J. (2005). Health informatics and nursing in Canada. *Healthcare Information Management and Communications*, 19(3), 49. Reprinted by permission of Healthcare Computing and Communications Canada, Inc.

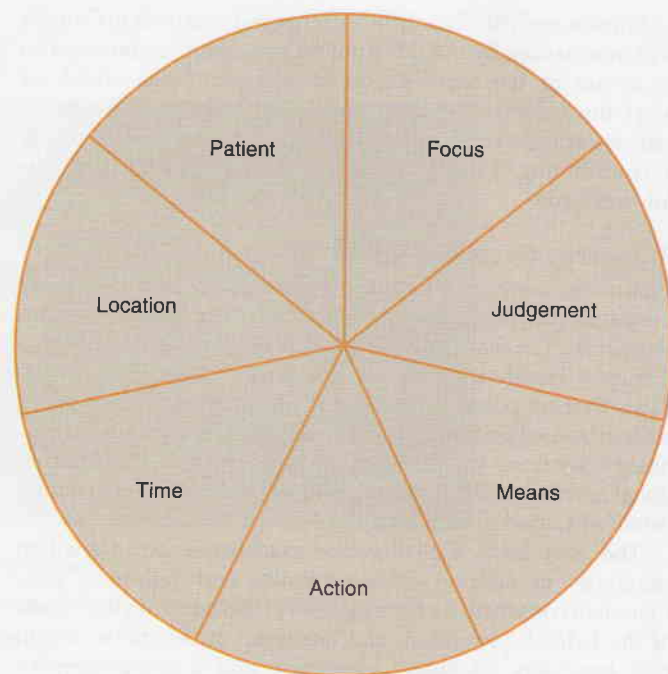


Figure 16-2 7-Axes model of the International Classification for Nursing Practice® (ICNP®), Version 2.0. **Source:** International Council of Nurses. (2009). *International Classification for Nursing Practice®, Version 2.0* (p. 12). Geneva, Switzerland: Author. Reproduced with permission of the International Council of Nurses © 2005.

subsets of diagnoses, actions, and outcomes specific to various practice areas or specialties (such as wound care) and continue to be developed. To begin catalogue development, nurses select a health care topic based on the needs of patients. The organization of the catalogue content would be determined by the nurses as ICNP® diagnoses, outcomes, and interventions are identified. ICN (2010) suggested that catalogues can fill a practical need in building health information systems with all the benefits of being part of a unified nursing language.

As stated earlier, the Canadian Nurses Association endorsed ICNP® as the terminology for documenting professional nursing practice in Canada (CNA, 2001a, 2006b). Although Canada Health Infoway, in consultation with various stakeholder groups, adopted SNOMED CT® as the terminology for the pan-Canadian electronic health record, ICNP® remains the preferred terminology for nursing. ICN, which holds the intellectual property rights to ICNP®, is in discussion with the **International Health Terminology Standards Development Organization (IHTSDO)**, which holds the intellectual property rights for SNOMED CT®, to identify means of linking between the two standardized clinical terminologies to ensure that nursing practice is accurately documented. Initial efforts on this linking are using the ICNP C-HOBIC catalogue (ICN, 2011) to test the methodology for linking ICNP® and SNOMED CT. Validation results were anticipated by July 2012. Innovative tools such as C-Space (see Figure 16-3) are being used in the validation process to leverage the expertise and contributions of the international community.

As illustrated in Figure 16-2, ICNP® Version 2.0 is constructed using seven axes: Focus, Judgement, Means, Action, Time, Location, and Patient. Table 16-3 lists definitions for each axis and examples of terms. According to ICNP® requirements,

previous iterations (Alpha, Beta, Beta 2), using a single 7-Axis Model to unify all previous ICNP® axes (see Figure 16-2). The ICNP® is a unified nursing language system. It is a compositional terminology for nursing practice that facilitates the development of and cross-mapping among local terms and existing terminologies (ICN, 2009). ICNP® Version 2 was launched on July 2, 2009, at the ICN 24th Quadrennial Congress in Durban, South Africa, and moved ICNP® forward with the addition of new content, including many new pre-coordinated nursing diagnosis, intervention, and outcome statements as well as the inclusion of catalogues (ICN, 2010).

ICNP® is used to generate statements of nursing diagnoses, nursing actions, and nursing outcomes, using terms arranged in a hierarchical order and in catalogues (or subsets) of pre-combined terms. Catalogues are made up of nursing data



Figure 16-3 Structure of International Classification for Nursing Practice® (ICNP®), Version 2.0, 2011 Release. **Source:** ICN C-Space. Reproduced with permission of the International Council of Nurses © 2012.

► **TABLE 16-3**

Definitions and Examples of Terms in ICNP® Version 1

Axis	Definition	Sample Terms
Focus	The area of attention relevant to nursing	<i>Elder abuse, sputum, air, child labour law</i>
Judgement	Clinical opinion or determination related to the focus of nursing practice	<i>High, enhanced, partial, risk</i>
Means	A manner or method of accomplishing an intervention	<i>Wound drainage bag, nebulizer, bed rail, cardiac monitor</i>
Action	An intentional process applied to or performed by a patient	<i>Violence prevention, explaining, listening, resuscitating</i>
Time	The point, period, interval, or duration of an occurrence	<i>Rarely, chronic, discharge, intermittent</i>
Location	Anatomical or spatial orientation of a diagnosis or intervention	<i>Chest wall, distal, residential building, supine, intravenous route</i>
Patient	Subject to which a diagnosis refers and who is the recipient of an intervention	<i>Extended family, community, adolescent, elder, infant</i>

Adapted from International Council of Nurses. (2009). *International Classification for Nursing Practice®*, Version 2.0 (p. 12). Geneva, Switzerland: Author. Reproduced with permission of the International Council of Nurses, copyright © 2005.

both nursing diagnoses and nursing outcomes *must* contain a term from the Focus axis and the Judgement axis and may include terms from additional axes as needed to fully describe the phenomenon of attention. Nursing Interventions *must* include a term from the Action axis and the Target axis and may include additional terms from other axes as necessary. ICN (2009) describes a “Target term” as a term originating in any axis except the Judgement axis.

You should keep in mind that the format of these nursing diagnosis statements may not correspond with those identified in previous chapters. The examples below reflect the core details for coding key nursing data in the EHR. These may not (and possibly will not) be used in daily communication among nurses, but rather for aggregation purposes in the EHR. Some examples of nursing statements using ICNP® Version 2.0 include the following:

Nursing Diagnosis: *Decreasing level of pain in right knee joint.*

Pain is from the Focus axis,

Decreasing level is from the Judgement axis

Both *right* and *knee joint* are from the Location axis

Nursing Intervention: *Analgesia injected*

Injected and *injecting* are from the Action axis

Analgesic is from the Means axis

Nursing Outcome: *Sputum decreased*

Sputum is from the Focus axis

Decreased is from the Judgement axis

As with all languages, development of ICNP® is continuous, with research underway in many countries (Boxes 16-2 and 16-3). Version 2.0 is subjected to ongoing evaluation to refine and enhance terms, catalogues, and translations.

Canadian Privacy Legislation

Although both provincial standards of practice and the CNA (2008a) *Code of Ethics* address confidentiality, you also need to be aware of Canadian privacy legislation affecting nursing practice and the protection of patient data. Even as you fulfill the standards of practice, it is possible to violate privacy

* BOX 16-2 RESEARCH HIGHLIGHT

Evaluating Standardized Nursing Terminology

Research Focus

Nursing data have not been included in national data repositories for a variety of reasons, including the lack of a single nursing terminology to describe the nursing contribution to patient/client care (i.e., nursing practice). Consequently, health care decisions have been made in the absence of valuable nursing data. The need for a standardized nursing language stimulated the development of the ICNP®. Testing was necessary to evaluate the representational capacity of this terminology for Canadian nursing practice. Kennedy (2005) examined the effectiveness of the ICNP® in representing the contributions of nursing to health care outcomes in Canada. The ICNP® was used to code retrospective nursing data extracted from patient records originating in acute care, in-patient mental health, home health care, and long-term care practice settings. In spite of a wide variation in documentation practices, ICNP® achieved matches with a significant majority of nursing data, thereby confirming the utility of ICNP® for documenting nursing practice in Canada.

Representing Nursing Practice

ICNP® represents Canadian nursing practice with high accuracy. Variations and gaps in nursing documentation practices are further evidence of the need for standardized terminology to ensure that at least minimum nursing data are recorded.

References: Kennedy, M. A. (2005). *Packaging nursing as politically potent: A critical reflexive cultural studies approach to nursing informatics*. Unpublished doctoral dissertation, University of South Australia, Adelaide, Australia; Kennedy, M. A. & Hannah, K. J. (2007). Representing nursing practice: Evaluating the effectiveness of a nursing classification system. *Canadian Journal of Nursing Research*, 39(7), 58–79.



> BOX 16-3 Creating Canadian Nursing History

The C-HOBIC Initiative

The CNA launched a multiprovince project in 2007, with financial investment by Canada Health Infoway, focused on collecting information reflecting evidence-based, nursing-sensitive patient outcomes (CNA, 2008b). Drawing on the work of the original **HOBIC (Health Outcomes for Better Information and Care) Project**, the **C-HOBIC (Canadian Health Outcomes for Better Information and Care) Project** (http://www2.cna-aic.ca/c-hobic/toolkit/default_e.aspx) is implementing a standardized nursing documentation approach for capturing, analyzing, and reporting nursing-sensitive outcomes for acute care, complex continuing care, long-term care, and home care.

The C-HOBIC project addresses gaps in health information related to nursing's contribution to patient outcomes and also addresses the need for standardized nursing data for inclusion on patient admission and discharge summaries. The major components of this project are a systematic approach to gathering nursing content that is documented using a standardized clinical terminology and coded in a format suitable for inclusion in the electronic health records being developed or implemented by the participating provinces. This project requires use of a standardized clinical terminology, International Classification for Nursing Practice® (ICNP®), and provides an opportunity for Canadian nurses to make substantive contributions to the ongoing development of ICNP®. One particular aspect of the C-HOBIC project was the mapping of outcomes concepts to the ICNP® Version 1.0.

Mapping challenges provided an immediate opportunity for Canadian nurses to contribute to the iterative development of ICNP® by proposing multiple new terms and to a catalogue of precombined terms for inclusion in ICNP® that are uniquely Canadian and reflect C-HOBIC concepts. The mapping was validated at a national forum (Kennedy, 2008; Kennedy et al., 2008) that included C-HOBIC partners, nursing informatics experts, nurse educators, nurse researchers, representatives from government ministries, policy institutions and practice environments, and two international ICNP® experts.

In total, 96 concepts were addressed in the mapping aspect of the C-HOBIC project: 58 HOBIC concepts were matched and validated as C-HOBIC terms, 13 HOBIC concepts were partially mapped to ICNP®, and a new term was required in ICNP® in order to fully communicate the original concept in C-HOBIC; 24 concepts did not match, and new C-HOBIC terms were proposed for inclusion in ICNP®, and only one HOBIC concept ("Activity did not occur") could not be mapped to ICNP®. In addition, two HOBIC ordinal scales were retained for use in C-HOBIC, including the pain scale and the number of falls. Consensus by the group was achieved for all concepts, terms, and issues. Critical next steps include the creation of the C-HOBIC catalogue by ICNP® and the establishment of a nursing terminology working group.

On January 11, 2012, the Standards Collaborative Strategy Committee (the most senior committee) endorsed the C-HOBIC/ICNP Data Set as a Canadian Approved Standard (CAS). This is the first nursing data standard approved as CAS, and Canada is the first country in the world to approve an ICNP® Catalogue as a national standard.

legislation. Canadians recognize this risk of privacy violation, and "two thirds of Canadian citizens believe that personal health information is one of the most important areas in need of protection under privacy laws" (Roch, 2008, p. 8). Although privacy legislation varies among provinces, you must develop a working knowledge of the relevant legislation supporting health information protection (Gershon & Tu, 2008), both provincial and national.

Two federal legislative acts address the protection of personal information. These are the *Privacy Act* and the *Personal Information Protection and Electronic Documents Act (PIPEDA)* (Government of Canada, 2004). Both acts identify specific limitations to the disclosure of personal information—whether in electronic or other forms. Regardless of the practice setting or mode, you are professionally, ethically, and legally obligated to protect all personal information of patients in your care (Box 16-4). Knowledge of these two pieces of federal privacy legislation can help you uphold the standards of practice and *Code of Ethics*.

According to the *Privacy Act*, Section 8.1, "Personal information under the control of a government institution shall not, without the consent of the individual to whom it relates, be disclosed by the institution" (Government of Canada, 1983). The PIPEDA is federal legislation governing the disclosure of personal health information in any electronic environment. This act extends the *Privacy Act* by addressing specific risks associated with electronic data collection, storage, retrieval,

and communication. The purpose of the PIPEDA, as updated in March 2006, is to "establish, in an era in which technology increasingly facilitates the circulation and exchange of information, rules to govern the collection, use and disclosure of personal information in a manner that recognizes the right of privacy of individuals with respect to their personal information and the need of organizations to collect, use, or disclose

► BOX 16-4

Distinguishing Types of Protected Information

PIPEDA distinguishes “personal information” from “personal health information” and provides specific definitions for both:

“Personal health information,” with respect to an individual, whether living or deceased, means

- (a) information concerning the physical or mental health of the individual;
- (b) information concerning any health service provided to the individual;
- (c) information concerning the donation by the individual of any body part or any bodily substance of the individual or information derived from the testing or examination of a body part or bodily substance of the individual;
- (d) information that is collected in the course of providing health services to the individual; or
- (e) information that is collected incidentally to the provision of health services to the individual.

“Personal information” means information about an identifiable individual but does not include the name, title, or business address or telephone number of an employee of an organization.

Source: Personal Information Protection and Electronic Documents Act, S.C. 2000, c. 5. Retrieved from <http://laws-lois.justice.gc.ca/eng/acts/P-8.6/page-1.html#h-3>.

personal information for purposes that a reasonable person would consider appropriate in the circumstances” (Department of Justice, 2011, <http://laws-lois.justice.gc.ca/eng/acts/P-8.6/page-2.html#h-5>). Furthermore, PIPEDA restricts the disclosure of personal information to only the most stringent of conditions, such as law enforcement requirements (Government of Canada, 2004, Division 1, Section 7.3).

PIPEDA was initially applicable only to personal information collected or used in commercial activities by private-sector entities regulated by the federal government. However, the act has been extended over time to cover the retail sector, publishing companies, the service industry, manufacturers and other provincially regulated organizations, and sector-specific data such as health information.

PIPEDA applies to Canadian jurisdictions unless the federal government acknowledges an exemption based on provincial legislation that is substantially similar. As of 2011, only British Columbia, Alberta, Quebec, and most recently Ontario are considered to have legislation substantially similar to PIPEDA (Office of the Privacy Commissioner, 2011). Despite provincial acts taking precedence within provinces, federal legislation continues to govern the transmission of personal information across and between provincial boundaries.

In addition to domestic legislation, other factors also affect the privacy of the EHR. Infoway’s privacy mandate is to support private, secure, and protected information in the EHR. In the course of doing so, Infoway, the Standards Collaborative, and their partners leverage applicable international standards (for example, from the International Organization for Standardization) that operate in alignment with Canadian legislation and further support the privacy and security of health data in electronic health care systems. You can review the scope of privacy activities for initiatives in which Infoway invests and for Standards Collaborative activities at the following Web page: <https://www.infoway-inforoute.ca/privacy-mandate>.

Despite the complex nature of privacy legislation and the standards that support privacy activities, you must exercise diligence in examining and applying these pieces of legislation to your professional nursing practice. You can review the privacy legislation in your province by going to this link: http://www.priv.gc.ca/resource/prov/index_e.cfm. Please refer to Chapter 15 to explore how PIPEDA relates to specific nursing documentation.

National e-Nursing Strategy

The CNA (2006a) released the *e-Nursing Strategy for Canada* to direct the coordinated integration of technology into Canadian nursing practice. The strategy addresses both medium- and long-term targets, with the overall goal of improving both nursing practice and outcomes for patients and clients. This strategy is intended to completely integrate ICT in such a way that the “e” in *e-nursing* is no longer required. ICT will simply be another tool that nurses use in their practice (CNA, 2006a). The CNA (2006a, p. 4) identified seven key outcomes that are projected to emerge from the *e-Nursing Strategy*:

1. Nurses will integrate ICT into their practice to achieve desirable patient outcomes.
2. Nurses will have the required information and knowledge to support their practice.
3. Human resources planning will be facilitated.
4. New models of nursing practice and health services delivery will be supported.
5. Nursing groups will be well connected.
6. ICT will improve the quality of nurses’ work environments.
7. Canadian nurses will contribute to the global community of nursing.

Three fundamental directions for the CNA’s *e-Nursing Strategy* were developed among working groups and national feedback: access, competencies, and participation. Access to quality ICT in the practice environment is imperative if Canadian nurses are to realize the full benefits of technology in their practices. The CNA (2008b) noted that health care organizations have a responsibility to ensure that nurses have connectivity—tools such as computers, mobile technology (e.g., laptops, smart phones and mobile tablets, wireless technology), as well as resource databases and Internet resources—that will support professional practice.

The CNA (2008b) encourages nurses to develop *competencies* in the application of ICT and recommended that such competencies be part of both undergraduate and graduate-level nursing programs. Just as you have a responsibility to develop competencies in performing a variety of patient care tasks, such as assessments and treatments, it is also your responsibility to develop and maintain competencies in technological applications that support information management in professional practice. Informatics and information management competencies are now included in the *Canadian Registered Nurse Examination* and are integrated throughout the Canadian Registered Nurse Examination Competencies for June 2010–May 2015 (CNA, 2010). To that end, an initiative (Canada Health Infoway, 2011), by the Canadian Association of Schools of Nursing (CASN) and Canada Health Infoway (Infoway) is intended to prepare nursing students for practice in modern, technology-enabled clinical environments. Through this initiative, CASN, with investment by Infoway, is working toward providing faculty and nursing students with the

BOX 16-5

CASE STUDY: ROLE OF AN ELECTRONIC COMMUNITY OF PRACTICE (eCOP) TO CREATE INTEREST AND POSITIVE ATTITUDE TOWARD NURSING INFORMATICS: THE BC EXPERIENCE

By Elizabeth Borycki and Noreen Frisch, University of Victoria Schools of Health Information Science and Nursing; Co-Leaders of the InspireNet eHealth Action Team

Nurses in British Columbia are connecting! For the purpose of garnering interest in nursing health services research, the BC Nursing Research Initiative through the Michael Smith Foundation for Health Research has funded a BC Nursing Health Services Research Network, now renamed as InspireNet (Innovative Nursing Services and Practice Informed by Research and Evaluation). Among InspireNet's goals are to create collaborative advantages by bringing like-minded people together to foster research, knowledge translation, and practice readiness. Based on an understanding that connections between and among people who are geographically dispersed requires virtual connections, InspireNet uses Web 2.0 and 3.0 technologies to conduct its work "virtually" through a Web site and by organizing its members into action teams that function as communities of practice. Wenger and others describe communities of practice as groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in the area of that topic by interacting on an ongoing basis. Electronic communities of practice (eCOPs) use social networking capabilities to support the establishment and work of groups of people.

After 18 months in operation, the InspireNet project had over 800 members connecting to each other through an e-newsletter, a password-protected database of members, a monthly blog prepared by members on current topics, and password-protected memberships in eCOPs called "InspireNet Action Teams." The Action Team eCOPs are formed around topics or areas of interest. Perhaps not surprisingly,

nurses interested in all of the various aspects of informatics were early adopters of an eCOP, which they have labelled the eHealth, eTechnologies and Informatics Action Team.

In an area of nursing where nurses are covering new ground (like informatics), and where nurses who have an interest in the topic may be few and far between, the connections found in a virtual environment can be critical. The InspireNet eHealth eCOP has brought over 50 nurses together in a short period of time. They have tuned into Web-based conferencing to learn about and discuss issues such as basic informatics, the need for education to address informatics, and the state of informatics work in their province. They have connected nurses who work in information technology units with nurses who work in professional practice offices. They have learned about membership in Canadian Nursing Informatics Association (CNIA) and have had speakers from afar (from Canada) on topics such as C-HOBIC and (from Europe) on demonstrations of fully implemented electronic nursing documentation systems. They have established a journal club to learn about some of the latest work in nursing informatics. And they have accomplished all of these activities without leaving home!

We encourage you, as beginning students in nursing, to participate in exploring the role that networking can play in your professional development and support. For starters, we recommend exploring membership in nursing organizations (such as the CNIA) for the purpose of finding those with similar interests as yours and seeking to establish connections with other nurses who wish to make a difference in Canadian nursing practice.

Networking may well be the future of social capital for nurses. Try it out for yourself!

Reference: Wenger, E., McDermott, R., & Snyder, W. (2002). *Cultivating communities of practice*. Boston: Harvard Business School Press. For further information, go to <http://www.InspireNet.ca>.

knowledge, tools, and support they need to teach, learn, and practise in technology-enabled practice settings. Educators, informatics experts, and students at the 91 nursing degree-granting colleges and universities across Canada are participating in a three-year effort to strengthen learning about effective uses of ICT, now essential tools in clinical practice. Key program components focus on the development, evaluation, and sharing of curriculum-based resources and e-learning tools.

Many examples of innovative nursing practice incorporating information and communications technology are evident in Canada (Box 16-5). Two such examples are the mobile wound assessment program used by the Victorian Order of Nurses and the standardized assessment approaches currently being integrated in the Local Health Integration Network (LHIN) in Ontario. Goodwin et al. (2008) combined telemedicine and telemonitoring with patient education and peer supports in assisting chronically ill patients to stay at home in rural Ontario. Without this program, these patients would have had to travel for care provision and would have potentially experienced more frequent hospitalizations, loss of independence, and significantly less self-care. Tracey (2008) described how a standardized assessment approach is in pilot testing at two sites. This pilot format will ultimately replace six different assessment forms, contributing to more

systematic data collection and greater capacity for data aggregation and analysis.

The CNA (2006a, p. 12) identified *participation* as including strategic partnerships with nurses in clinical practice; with employers and administrators; with federal, provincial, and territorial ministries; with nursing organizations (professional associations, regulatory bodies, educational groups, and unions); and with educators and researchers. The concept of partnership has far-reaching consequences: with effective partnerships, you can contribute to the selection and design of information technology applications, as well as contributing to educational programs. For example, many health care institutions and agencies have clinical committees that collaborate with IT experts in the design and selection of electronic documentation systems. Especially as a novice nurse, you have both the knowledge and opportunity to contribute your insights about which information management systems are user friendly or present unexpected challenges. It is also helpful to have this type of clinician involvement when system revision or adaptation is required. Even small changes can sometimes have a significant impact on the capture of appropriate nursing data and how nurses view the system. Without partnerships, however, you, and all nurses, risk being excluded from decision making and using systems that are selected without valuable clinician contributions.

The Canadian Nurses Association portal, NurseONE, is a key component of the *e-Nursing Strategy*. The portal was initially funded from a grant from the First Nations and Inuit Health Branch (FNIHB) of Health Canada (CNA, 2006c). The nursing portal, now known as NurseONE, enables you to register, create a personal profile, and customize use of the site's tools and resources. NurseONE provides such services as the following:

- Professional links (resources with clinical or professional orientation)
- Professional development (including resources for continuing competence, online and continuing education, and career development)
- Library (access to numerous articles and publications)
- NurseConnect (use of the portal to create discussion groups among individual subscribers)

Resources available to subscribers also include conducting self-assessments, creating individualized learning plans, and developing an online professional portfolio. You can also track current news and nursing information, receive updates and alerts on items of interest, access educational opportunities, and search for practice support on the NurseONE site. This site will continue to develop over time and provides a centralized professional nursing forum for Canadian nurses.

Clinician Engagement and Informatics Communities

Many Canadian and international health informatics communities exist that offer exciting opportunities for participation: support, educational programs, and networking opportunities. Of most importance, these communities always welcome new members who are interested in advancing informatics. As noted throughout this chapter, involving clinicians in the selection, design, and revision of technology is critically important. As a professional, you have both an obligation and a right to be involved in issues that affect your professional practice and your work environment.

Many informatics organizations have specific strategies to foster clinician engagement or encourage clinicians to become involved; however, literature on the topic of clinician engagement is scarce. Mercer (2008) promoted involvement through five questions (the “5 Ws”): (1) What is it? (2) Who should be involved? (3) Why is it important? (4) Where does it fit? and (5) When should clinicians get involved? Mercer advocated immediate involvement in any clinical environment.

The CNA is the national professional body representing Canadian nurses. The CNA's mandate of supporting professional nursing practice also includes supporting the integration of nursing informatics in Canada. The CNA has issued many position statements and professional guidelines to support all nurses as technology has become increasingly integrated into Canadian practice environments. The CNA provides an excellent starting point from which you can explore nursing informatics in Canada.

The **Canadian Nursing Informatics Association (CNIA)** is the national special interest group dedicated to the advancement of nursing informatics in Canada (Box 16-6). CNIA is designated as a group affiliated with the CNA. Also affiliated with COACH, CNIA is the Canadian nursing representative to the **International Medical Informatics Association–Special Interest Group in Nursing Informatics (IMIA–SIGNI)**. Originally functioning as a special-interest group within COACH,

► BOX 16-6

Getting to Know Your Canadian Nursing Informatics Association

The mission of the CNIA is to enable the improvement of nursing through the use of evidence-based practice using nursing informatics, information technology, and information management.

The goals of this national organization include the following:

1. Influence and advance the use of nursing informatics and nursing data standards.
2. Connect nurses and health providers across the country for the purpose of improving best practice.
3. Support nurses in practice and education by providing resources for the advancement of nursing informatics competencies via training, tool kits, standards, and communities of practice.
4. Establish best practices in clinical information technology (IT) and information management.

Membership offers benefits such as access to a network of national nursing informatics experts and communication forums, valuable educational opportunities and conference events, and the ability to contribute to national discussions shaping the nursing informatics space. Find out more about CNIA at <http://cnia.ca/>.

Source: Canadian Nursing Informatics Association. (2011). *2011 strategic plan*. Toronto: Author.

this group disbanded in 2000 and resumed as the CNIA (CNIA, 2000). This group has agreed to include the following mandates:

- To provide nursing leadership for the development of nursing and health informatics in Canada
- To establish national networking opportunities for nurse informaticians
- To facilitate informatics educational opportunities for all nurses in Canada
- To engage in international NI initiatives
- To act as a nursing advisory group in matters of nursing and health informatics

Since being founded, the CNIA has hosted successful national NI conferences, launched a national online journal (*Canadian Journal of Nursing Informatics*), provided educational offerings, and advocated for the advancement of NI in Canada. CNIA continues to evolve, incorporating a new journal club and new initiatives supporting nurses' continuing education opportunities.

In 2011, Canada Health Infoway launched a new initiative with the CASN, designed to integrate informatics competencies into nursing curricula across Canada. Additionally, Infoway hosts a Clinician Peer Network to foster greater knowledge and adoption among clinicians.

As noted earlier in this chapter, COACH is another organization dedicated to promoting health informatics within the Canadian health system through education, information, networking, and communication. COACH was formed in 1975 by software developers and health care clinicians (COACH, 2011). Their original focus was to support effective use of information technology and systems among Canadian health institutions by sharing ideas and efforts. This focus has expanded to include the effective use of health information for decision making.

COACH's multidisciplinary membership encompasses more than 1300 individuals, including health care executives, physicians, nurses and allied health professionals, researchers

and educators, chief information officers, information managers, technical experts, consultants, and information technology vendors (COACH, 2011). Member organizations include health care service deliverers, government and nongovernment agencies, consulting firms, commercial providers of information and telecommunications technologies, and educational institutions.

In addition to the previous groups, you can also contribute your clinician perspective to the various Standards Collaborative Working Groups (SCWGs) sponsored by Infoway. These groups are open and voluntary in nature, which means that you need only express your interest to participate; you do not need to hold paid membership in the Standards Collaborative. You will be welcomed to any SCWG groups; however, most nurses will find that the Public Health (SCWG 1), Individual Care (SCWG 2), and Terminology (SCWG 9) SCWGs will reflect their professional areas of interest. Participating in these SCWGs not only supports your professional practice but also offers you an opportunity for professional development and mentoring. Many experienced nurses are currently involved in advisory groups of the Standards Collaborative, but the SCWGs consistently need and solicit clinician engagement. You can access the SCWGs at the following URL: <https://www.infoway-inforoute.ca/forums>.

You can also choose to participate in a variety of international informatics organizations. These include the **American Medical Informatics Association (AMIA)**, the **International Medical Informatics Association (IMIA)**, and the **Health Informatics Society of Australia (HISA)**, all of which host special-interest groups in NI. You can be involved at every level of information management in health care. Your challenge and opportunity is to decide where your interest and energy can be best used.

In addition to the formal organizations that you may consider joining, numerous informal communities are devoted to NI and creating dialogue among nurses. You may decide to explore a variety of informal communities or social entities, including the following:

- **Blogs:** These are online diaries generally sponsored by individuals, which are occasionally interactive but typically present only the thoughts and opinions of the blog's sponsor.
- **Wikis:** These are Web pages that are interactive and allow subscribers to modify or contribute to the content. Subscribers are able to use any Web browser. Wikis also allows users to incorporate hyperlinks and use a simplified language to create new pages and linkages rapidly.
- **Listserv and discussion groups:** These are e-mail distribution lists. NI sites allow and encourage you to subscribe to the listserv or discussion groups so you can receive regular contact and updates in regard to content, activities, or networking opportunities. These tools also allow you to ask question, post messages, and network with colleagues
- **Social media:** Communities such as Facebook or Twitter allow subscribers to join or follow groups who are interested in shared interests and activities. These Web-based communities include a variety of ways in which subscribers may communicate, such as chat, messaging, e-mail, blogs, video, voice chat, file sharing, discussion groups, and message boards. Interest groups and organizations are regularly using these types of social media tools to create communities of practice and share experiences. Nurses who use these tools must do so in a fashion consistent with the ethical practice of nursing and privacy legislation.

The value of interest in informal networking cannot be underestimated; however, you should not depend on these types of forums for consistent, professional, and credible health informatics information. Some sites may offer highly professional informatics advice or information; unfortunately, no standards exist with regard to either content or process. Many sites offer only personal or anecdotal commentary and may provide misleading information, which can create liability if used in your professional practice. Consequently, you must critically evaluate the content of these informal sites and groups to determine the validity of the content, the credibility of the organization or group, and the intent of the networking tool. The most effective way to obtain reliable and authoritative information is through formalized organizations that are committed to the professional advancement of informatics.

✦ CRITICAL THINKING EXERCISES

1. You have been assigned to lead a team tasked with implementing a standardized nursing terminology for your hospital. What critical topics would you assign your team for review? What groups would you connect with to initiate discussions on best practices? What would be the top four activities to proceed with this task?
2. During the course of documenting an admission assessment, you note that your patient has had a previous admission to a psychiatric unit. One of your colleagues is a neighbour of the patient and asks you to confirm whether this patient has a psychiatric history. Your colleague is not providing care to the patient. How do you respond to this inquiry? What pieces of legislation do you consider in helping you come to a decision?

✦ REVIEW QUESTIONS

1. Changes that occurred in the health care system over the last few decades that have contributed to the recognition of NI include
 1. Decreasing technology in health care and the evolution toward evidence-informed practice
 2. Requests for nursing informatics from administrators and national databases
 3. A recognition among nurses that specific nursing data must be documented consistently in order to create high-quality health data, support evidence-informed decision making, and represent nursing contributions
 4. Competition among professions to lead technology adoption
2. The factors behind the need for standardized nursing documentation include which of the following?
 1. To facilitate aggregation of nursing data, and support data analysis
 2. To enhance communication among nurses
 3. To improve representation regarding nursing contributions
 4. All of the above
3. Identify which of the following standardized nursing terminology is being used in Canada.
 1. interRAI
 2. ICNP®
 3. SNOMED CT®
 4. HOBIC

4. Select which of the following privacy legislation influences nursing practice in Canada.
 1. PIPEDA and the *Privacy Act*
 2. PIPEDA and SCWGs
 3. Standards Collaborative Working Groups (SCWG) and Standards
 4. *Privacy Act* and *Code of Ethics*
5. How can you, as a nurse, enact the *e-Nursing Strategy*?
 1. Buy your own laptop, and design a nursing-related website
 2. Complete mandatory education on your hospital information system
 3. Support access to technology for all nurses, develop your technology competencies, and participate in advancing ICT and NI
 4. Work at the Canadian Nurses Association
6. What nursing or health informatics communities are available to nurses?
 1. CNIA, IMIA-SIGNI
 2. CNA, CMA
 3. HOBIC, TTYL
 4. CSA, ICD-10

✦ RECOMMENDED WEB SITES

American Medical Informatics Association (AMIA): <http://www.amia.org/>

The American Medical Informatics Association is a national association in the United States that is dedicated to the adoption and advancement of technology in health care.

American Medical Informatics Association–Alliance for Nursing Informatics: <http://www.amia.org/programs/alliance-nursing-informatics>

The American Medical Informatics Association–Nursing Informatics is a special-interest group within the American Medical Informatics Association. This group is focused on the advancement of informatics as it relates specifically to American professional nursing practice.

Canadian Association of Schools of Nursing (CASN) Nursing Informatics Inventory: Existing Teaching and Learning Resources (2012): <http://casn.ca/en/108/item/127>

This inventory includes Canadian and international resources offering guidance on the integration of nursing informatics into nursing practice.

Canada Health Infoway: <http://www.infoway-inforoute.ca/>

Canada Health Infoway is Canada's national not-for-profit body that generates consensus on health information standards, drives the national agenda of creating an EHR, and acts as the liaison to international standards development organizations.

Canadian Nursing Informatics Association: <http://cnia.ca/intro.htm>

The Canadian Nursing Informatics Association is Canada's national body with a mission to advance nursing informatics

in Canada. The CNIA is also the publisher of the *Canadian Journal of Nursing Informatics*.

Canadian Organization for Advancement of Computers in Health (COACH): <http://www.coachorg.com/>

COACH is a Canadian not-for-profit association that is dedicated to the effective integration of technology in health care. This association is one of the largest informatics associations in Canada and includes members from all health care disciplines.

Health Informatics Society of Australia (HISA): <http://www.hisa.org.au/>

HISA is the national not-for-profit association for advancing informatics in Australia.

Health Informatics Society of Australia–Nursing Informatics: <http://www.hisa.org.au/nursing>

The Health Informatics Society of Australia–Nursing Informatics is a special-interest group within the Health Informatics Society of Australia. This group is focused on the advancement of informatics as it relates specifically to professional nursing practice in Australia.

International Medical Informatics Association (IMIA): <http://www.imia.org/>

IMIA is an international not-for-profit association and is dedicated to the adoption and advancement of technology in health care.

International Medical Informatics Association–Nursing Informatics: <http://www.imiani.org/>

The International Medical Informatics Association–Nursing Informatics is a special interest group within the International Medical Informatics Association. This group is focused on the advancement of nursing informatics with international implications.

National Institute of Nursing Informatics: <http://bloomberg.nursing.utoronto.ca/CASPP/profdev/informatics.htm>

This three-day educational program for nurse educators, nurse leaders, or nurses interested careers in nursing informatics is held in Toronto.

NurseONE: <http://www.nurseone.ca/>

The NurseONE site is one of the outcomes of the Canadian Nurses Association *e-Nursing Strategy*. This site offers nurses a diverse array of educational tools, professional practice supports, and networking opportunities.

Office of the Privacy Commissioner of Canada: http://www.priv.gc.ca/aboutUs/mm_e.cfm#contenttop

Personal Information Protection and Electronic Documents Act (PIPEDA): http://www.priv.gc.ca/leg_c/leg_c_p_e.cfm#contenttop

Review Question Answers

1. 3; 2. 4; 3. 2; 4. 1; 5. 3; 6. 1

Rationales for the Review Questions appear at the end of the book.

Communication

Written by Sonya L. Jakubec, RN, MN, PhD(c), and Barbara J. Astle, RN, PhD

objectives

Mastery of content in this chapter will enable you to:

- Define the key terms listed.
- Describe aspects of critical thinking that are important to the communication process.
- Describe the five levels of communication and their uses in nursing.
- Describe the basic elements of the communication process.
- Discuss the role of communication in relational practice.
- Identify the communication skills important for relational practice.
- Identify significant features and therapeutic outcomes of nurse–patient helping relationships.
- List nursing focus areas within the four phases of a nurse–patient helping relationship.
- Identify significant features and desired outcomes of nurse–health care team member relationships.
- Describe qualities, behaviours, and communication techniques that affect professional communication.
- Discuss effective communication techniques for patients at various developmental levels.
- Identify patient health states and conditions that contribute to impaired communication.
- Discuss nursing care measures for patients with special communication needs.

media resources

evolve WEBSITE

<http://evolve.elsevier.com/Canada/Potter/fundamentals/>

- Audio Chapter Summaries
- Examination Review Questions
- Glossary
- Student Learning Activities
- Weblinks

key terms

- | | |
|-------------------------------------|--|
| Active listening, p. 254 | Perception, p. 243 |
| Aphasia, p. 258 | Perceptual biases, p. 243 |
| Assertive, p. 251 | Public communication, p. 245 |
| Autonomy, p. 251 | Questioning beyond the surface, p. 243 |
| Authenticity, p. 243 | Receiver, p. 245 |
| Channels, p. 246 | Receptive aphasia, p. 258 |
| Communication, p. 242 | Referent, p. 245 |
| Collaborative communication, p. 250 | Reflexivity, p. 244 |
| Elderspeak, p. 252 | Relational communication, p. 243 |
| Empathy, p. 254 | Relational practice, p. 252 |
| Environment, p. 246 | Seeking contextual knowledge, p. 244 |
| Expressive aphasia, p. 258 | Sender, p. 245 |
| Feedback, p. 246 | Small-group communication, p. 245 |
| Global aphasia, p. 258 | Spiritual inquiry, p. 245 |
| Initiative, p. 243 | Symbolic communication, p. 248 |
| Intentionality, p. 254 | Sympathy, p. 257 |
| Interpersonal communication, p. 245 | Therapeutic communication techniques, p. 254 |
| Interpersonal variables, p. 246 | Transpersonal communication, p. 245 |
| Intrapersonal communication, p. 244 | Verbal communication, p. 246 |
| Message, p. 245 | |
| Metacommunication, p. 248 | |
| Mutuality, p. 243 | |
| Narrative interactions, p. 249 | |
| Nonverbal communication, p. 247 | |

Communication is a lifelong learning process for the nurse. Nurses are intimately involved with patients and their families from birth to death. It is important to build therapeutic communications for this journey. Nurses should communicate effectively with people who are in stressful circumstances. They function as patient advocates and as members of interprofessional teams, other members of which often have different priorities for patient care. Nurses also have to communicate their own needs to avoid burnout and to continue providing effective care (Balzer Riley, 2008). Despite the competing demands on nurses' time and current technological complexity, it is the intimate nurse–patient

connection that makes the difference in the quality of care and in the meaning of the illness experience for both (Balzer Riley, 2008). Therefore, competency in a variety of communication techniques supports the nurses' ability to develop and maintain therapeutic relationships. Effective communication promotes collaboration and interdisciplinary teamwork, helps ensure that ethical and legal responsibilities and professional practice standards are met, and contributes to positive patient outcomes (Apker et al., 2006). Ineffective communication may lead to poor patient outcomes, increases in adverse incidents, and decreases in professional credibility. The Conference Board of Canada considers communication and interpersonal relationship skills to be crucial for successful employment and the establishment of healthy work environments (Devito et al., 2011).

The qualities, behaviours, and therapeutic communication techniques described in this chapter characterize professionalism in helping relationships. Although the term *patient* is often used, the same principles can be applied in communicating with any person, group, or population in any nursing situation.

Communication and Interpersonal Relationships

At the core of nursing care are therapeutic interpersonal relationships based on caring, mutual respect, and dignity. Communication is the means to establish these helping-healing relationships. As all behaviour communicates, and all communication influences behaviour, nurses must become experts in communication if they are to provide effective care.

The nurse's capacity to be in relation with other people—to take initiative in establishing and maintaining a relationship, to be authentic and responsive to the other person—is a crucial aspect of interpersonal communication. The will and active intention of nurses to join people where they are is what is meant by initiative in **relational communication**. Reaching out and listening are parts of taking **initiative**. Being spontaneous and genuine, aware of the in-the-moment experiences of the patient and one's self, are aspects of **authenticity**. Authenticity is often one of the characteristics of nurses that imbues the trust of the public. Hartrick Doane & Varcoe (2005) explain that "when a nurse has the initiative to be with another in an authentic way, she or he is able to respond to the other as they are in that moment" (p. 193). Effective interpersonal communication also requires a sense of **mutuality** and being in a mutual relation. Being "in synch" in this way is based on a belief that the nurse–patient relationship is a partnership and that both partners are equal participants. Mutuality requires that both participants respect each other's autonomy and value system and are committed to the patient's well-being (Arnold & Boggs, 2011). In their work, nurses honour the fact that people are complex and ambiguous beings. Often, more is communicated than is initially apparent, and patient responses are not always what you might expect. **Questioning beyond the surface** is a skill that nurses employ that facilitates relationships within complex circumstances of health and illness. Nurses are further able to engage with ambiguity and complexity and expand their capacity to communicate by focusing on their relational capacity and skills of:

- Letting be
- Listening
- Self-observation

- Questioning to look beyond the surface
- Intentionality
- Interrupting contextual constraints
- Reimagining (Hartrick Doane & Varcoe, 2005)

Other perspectives of communication and relationships draw upon notions of balance (Hunter et al., 2006) and energy fields (Guelnder et al., 2005) as aspects of communication that permeate and connect all beings. Although the use of energy and nature to heal is a relatively new concept in Western cultures, it has long existed in Aboriginal and Eastern cultures. Most nurses embrace the profession's view of people as holistic beings and have experienced synergy in human interactions.

Therapeutic communication occurs within a healing environment between a nurse and a patient (Arnold & Boggs, 2011). While their very words are medicine or poison, nurses also know that attitudes and emotions are easily transmitted and can be communicated intentionally or unintentionally. Every nuance of posture, every small expression and gesture, every word chosen, every attitude held—all have the potential to hurt or heal. Because thought patterns (positive or negative), intention, and behaviour directly influence human energy fields and therefore health, nurses have a tremendous ethical responsibility to pay careful attention to their communication with patients. Communication must be respected for its potential power and not carelessly misused to hurt, manipulate, or coerce patients. Good communication empowers patients and enables them to know themselves and make their own choices, which is an essential aspect of the healing process. Nurses have the opportunity to create positive outcomes for themselves, patients, and colleagues through therapeutic communication.

Developing Communication Skills

Gaining expertise in communication requires an understanding of the communication process, commitment to an evolving capacity to be in relation to others, and in-depth reflection about personal communication experiences (Balzer Riley, 2008). In addition, the qualities of good critical thinking and problem solving are important to the communication process. Curiosity, perseverance, creativity, self-confidence, independence, fairness, integrity, and humility are useful in approaching a problem (see Chapter 11).

Interpersonal communication may be challenging because it is based on an individual's perception of received information and is therefore subject to misinterpretation. **Perception** is based on information acquired through the five senses of sight, hearing, taste, touch, and smell (Austin & Boyd, 2010). It is a process of mentally organizing and interpreting sensory information to arrive at a meaningful conclusion. An individual's culture, education, and personal background also influence perception (see Chapter 9). Critical thinking and self-reflection can help nurses overcome **perceptual biases**, which are human tendencies that interfere with accurately perceiving and interpreting messages from other people. People often assume that others would think, feel, act, react, and behave as they themselves would in similar circumstances. People tend to distort or ignore information that goes against their expectations, preconceptions, or stereotypes (Beebe et al., 2011). By thinking critically about personal communication habits, you will gain awareness of these tendencies and become more responsive to your patients and your goals of therapeutic communication.

► BOX 17-1

Communication Throughout the Nursing Process

Assessment

Verbal interviewing and history taking
 Visual and intuitive observation of nonverbal behaviour
 Documentation of visual, tactile, and auditory data during physical examination
 Written medical records, diagnostic test results, and literature review

Nursing Diagnosis

Intrapersonal analysis of assessment findings
 Validation of health care needs and priorities through verbal discussion with patient
 Handwritten or electronic documentation of nursing diagnosis

Planning

Interpersonal or small-group planning sessions with health care team
 Interpersonal collaboration with patient and family to determine implementation methods
 Written documentation of expected outcomes
 Written or verbal referral to members of the health care team

Implementation

Delegation and verbal discussion with health care team
 Verbal, visual, auditory, and tactile health teaching activities
 Provision of support through therapeutic communication techniques
 Contact with other health care resources and the interprofessional team
 Written documentation of patient's progress in medical record
 Communicating targeted, effective public and population health messages

Evaluation

Acquisition of verbal and nonverbal feedback
 Comparison of actual and expected outcomes
 Identification of factors affecting outcomes
 Modification and update of care plan
 Verbal or written explanation, or both, of revisions of care plan to patient
 Receiving and responding to feedback about one's own nursing care

As communication skills develop, competence in the nursing process occurs. Integration of communication skills throughout the nursing process facilitates collaboration with patients and members of the interprofessional team (Box 17-1). Communication skills are used to gather, analyze, and transmit information and to accomplish the work of each step of the process. Assessment, diagnosis, planning, implementation, and evaluation all depend on effective communication among nurse, patient, family, and other members of the interprofessional team. Although the nursing process is a reliable framework for patient care, it does not work well unless you master the art of effective interpersonal communication.

The nature of the communication process requires nurses to constantly make decisions about what, when, where, why, and how to convey messages to other people. Decision making is always contextual; unique features of any situation influence the nature of the decisions made. For example, the importance of following a prescribed diet will be explained differently to a patient with a newly diagnosed medical condition than to a patient who has repeatedly chosen not to follow diet restrictions. In nursing communication, **seeking**

► BOX 17-2

Challenging Communication Styles of Patients

- Silent, withdrawn; do not express any feelings or needs
- Sad, depressed; have slow mental and motor responses
- Angry, hostile; do not listen to explanations
- Uncooperative; resent being asked to do something
- Talkative, lonely; want someone with them all the time
- Demanding; want someone to wait on them or meet their requests
- Ranting and raving; blame nursing staff unfairly for their misfortunes or difficulties
- Sensory impaired; cannot hear or see well
- Verbally impaired; cannot articulate needs or desires
- Gossiping; violate confidentiality and cause friction
- Mentally handicapped; are frightened and distrustful
- Confused, disoriented; are bewildered and uncooperative
- Foreign-born; speak very little of the dominant culture's language
- Anxious, nervous; cannot cope with what is happening
- Grieving, crying; have sustained a major loss
- Screaming, kicking (toddlers); want their parents
- Flirtatious, sexually inappropriate
- Loud, obscene; cause disturbances or violate rules

contextual knowledge is the building block to providing context-based and relevant care (Hartrick Doane & Varcoe, 2005). Effective communication skills such as “seeking contextual knowledge” are easy to learn, but their application is more difficult and nuanced. Deciding which approach is most responsive to each unique nursing situation is challenging and requires tremendous self-awareness and reflexivity. **Reflexivity** is being aware of your own patterns of communication and own response to communication as well as the responses you are evoking in others. When considering self-awareness, imagine how communication about specific diagnoses such as cancer or end-of-life conditions and dealing with patient and family emotions might be challenging to you. Certainly, some nurses struggle to cope with their own reactions and emotions when communicating difficult news to families and patients (Sheldon et al., 2006).

Throughout this chapter, brief clinical examples guide you in the use of effective communication techniques. Styles of patients that commonly challenge nurses' decision making and communication are described in Box 17-2. Because the best way to acquire skill is through practice, it is useful for you to know yourself and your own personal styles, as well as typical responses to situations. Discussing and role playing these scenarios before experiencing them in the clinical setting may be helpful.

Levels of Communication

Nurses use different levels of communication in their professional role: intrapersonal, interpersonal, transpersonal, small-group, and public.

Intrapersonal Communication

Intrapersonal communication, exemplified in one's thinking, is also known as *self-talk* or *inner thought*. It is a powerful form of communication that occurs *within* an individual (Beebe et al., 2011). Nurses and patients use intrapersonal communication to develop self-awareness and a positive

self-concept that can facilitate self-expression and improve health and self-esteem by replacing negative thoughts with positive assertions.

Interpersonal Communication

Interpersonal communication is the one-to-one interaction between the nurse and patient that often occurs face to face. It is the level most frequently used in nursing practice. It takes place within a social context and includes all the symbols and cues used to give and receive meaning.

Sometimes messages are received differently than the messenger intended. Nurses work with people who have different opinions, experiences, values, and belief systems; therefore, meaning must be validated or mutually negotiated between participants.

Transpersonal Communication

Transpersonal communication occurs within a person's spiritual domain. Nurses are able to communicate and relate to their patients within this domain (see Chapter 27). **Spiritual inquiry** is an approach to communication whereby nurses can join with their patients to create a road map of what is meaningful, significant, and important for the patient in their unique context. This inquiry illuminates the patient's contexts, understandings, experiences, and hopes. It is through such dialogue that nurses can communicate with patients in times of deeper, often complex, conflicted, and ambiguous situations (Hartrick Doane & Varcoe, 2005).

Small-Group Communication

Small-group communication is interaction that occurs when a small number of people meet together and share a common purpose. This type of communication is usually goal-directed and requires an understanding of group dynamics. When nurses work on committees, lead patient support groups, form research teams, or participate in patient care conferences, they are using the small-group communication process. For small groups to function effectively, members must feel accepted, comfortable in sharing ideas and thoughts openly and honestly, and able to actively listen to other group members and consider possible alternative viewpoints (Arnold & Boggs, 2011).

Public Communication

Public communication is interaction with an audience. Nurses have opportunities to speak with groups of consumers about health-related topics, present scholarly work to colleagues at conferences, lead classroom discussions with peers or students, or engage in public advocacy or media activities. Public communication requires special adaptations in eye contact, gestures, and voice inflection and the use of media materials to communicate messages effectively. The purpose of public communication by nurses is to increase audience knowledge about health-related topics, health care issues, and other issues important to the nursing profession.

Basic Elements of the Communication Process

Communication is an ongoing, dynamic, and multidimensional process. Its basic elements are illustrated in Figure 17-1 and described in the following paragraphs. This simple model represents what is, in practice, a very complex process. The model helps identify essential components of communication.

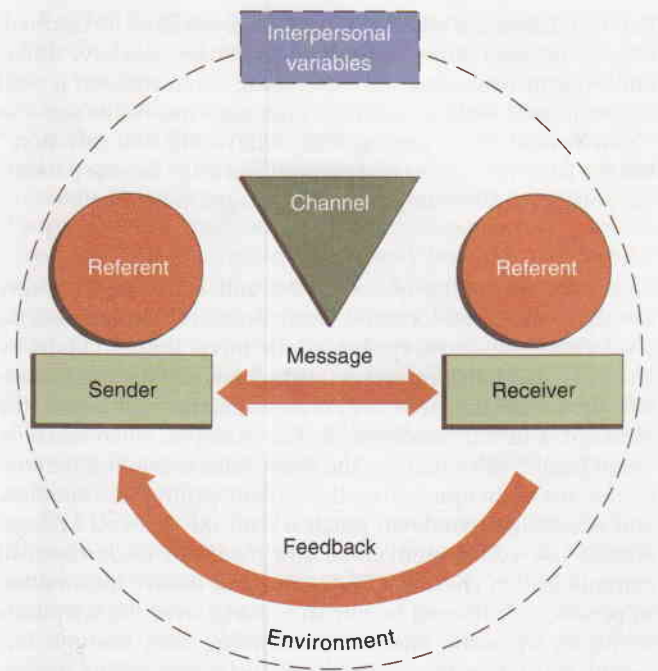


Figure 17-1 Communication is an active process between sender and receiver.

Referent

The **referent** motivates one person to communicate with another. In a health care setting, sights, sounds, odours, time schedules, messages, objects, emotions, sensations, perceptions, ideas, and other cues trigger communication. When a nurse knows the stimulus that triggered communication she or he is able to develop and organize messages for effective communication.

Sender and Receiver

The **sender** is the person who encodes and delivers the message, and the **receiver** is the person who receives and decodes the message. The sender puts ideas or feelings into a form that can be transmitted and is responsible for accuracy and emotional tone. The sender's message acts as a referent for the receiver, who is responsible for attending to, decoding, and responding to the sender's message. Sender and receiver roles are fluid and change back and forth as people interact; sometimes sending and receiving even occur simultaneously. The more the sender and receiver have in common and the closer their relationship, the more likely they will accurately perceive one another's meaning and respond accordingly.

Messages

The **message** is the content of the communication. It contains verbal, nonverbal, and symbolic expressions of thoughts or feelings that are transmitted from the sender to the receiver (Arnold & Boggs, 2011). Personal perceptions sometimes distort the receiver's interpretation of the message. Two nurses can provide the same information and yet convey very different messages according to their personal communication styles. One nurse can send the same message to two people and be understood differently by each. You can send effective messages by expressing yourself clearly, directly, and in a manner familiar to the receiver. By watching the listener for nonverbal cues that suggest confusion or misunderstanding,

you can determine whether the message needs to be clarified. Communication can be difficult when participants have different levels of education and experience. “Your incision is well approximated without purulent drainage” means the same as “Your wound edges are together, with no signs of infection,” but the latter is easier to understand. You must be sure patients are able to read before you send messages in writing.

Channels

Channels are means of conveying and receiving messages through visual, auditory, and tactile senses. Facial expressions send visual messages, spoken words travel through auditory channels, and touch traverses tactile channels. The more channels the sender uses to convey a message, the more clearly the message is usually understood. For example, when teaching about insulin self-injection, the nurse talks about and demonstrates the technique, gives the patient printed information, and encourages hands-on practice with the vial and syringe. Nurses use verbal, nonverbal, and mediated (technological) communication channels. They send and receive information in person; by informal or formal writing; over the telephone or pager; by audio and video recording; and through fax, e-mail, and interactive electronic or social networking media.

Feedback

Feedback is the message returned by the receiver. It indicates whether the meaning of the sender’s message was understood by the receiver. Senders need to seek verbal and nonverbal feedback to ensure that clear communication has occurred. To be effective, the sender and receiver must be sensitive and open to each other’s messages, clarify the messages, and modify behaviour accordingly. In a social relationship, both participants assume equal responsibility for seeking openness and clarification, but in the nurse–patient relationship, this responsibility is primarily the nurse’s.

Interpersonal Variables

Interpersonal variables are characteristics within both the sender and receiver that influence communication. People perceive events differently (Austin & Boyd, 2010). A nurse might say, “You have been very quiet since your family left. Is something on your mind?” One patient might perceive the nurse’s question as showing caring and concern; another might perceive the nurse as being intrusive. It is the responsibility of the nurse to seek out the variables and contexts that will communicate sensitively and effectively. Other interpersonal variables include educational and developmental levels, sociocultural backgrounds, values and beliefs, emotions, gender, physical health status, and roles and relationships. Variables associated with illness, such as pain, anxiety, and medication effects, can also affect nurse–patient communication and should all be considered in communication choices (Feldman-Stewart et al., 2005).

Environment

The **environment** is the setting for sender–receiver interaction. For effective communication, the environment should meet nurse and patient needs for physical and emotional comfort and safety. Noise, temperature extremes, distractions, and lack of privacy or space create confusion, tension, and discomfort. Environmental distractions are common in health care settings and interfere with messages sent between people. Establishing as comfortable an environment as possible to

create favourable conditions for effective communication is a role of the nurse.

Forms of Communication

Messages are conveyed verbally, nonverbally, concretely, and symbolically. As people communicate, they express themselves through words, movements, voice inflection, facial expressions, and use of space. These elements work in harmony to enhance a message and can also conflict with one another to contradict or confuse the message.

Verbal Communication

Verbal communication entails the use of spoken or written words. Verbal language is a code that conveys specific meaning through a combination of words. The most important aspects of verbal communication follow.

Vocabulary. Communication is unsuccessful if senders and receivers cannot decode each other’s words and phrases. When a nurse cares for a patient who speaks another language, the services of an interpreter may be necessary. Even those who speak the same language use subcultural variations of certain words: *dinner* may mean a noon meal to one person and the last meal of the day to another. Medical jargon (technical terminology used by the interprofessional team) may sound like a foreign language to patients and should be used only with other members of the interprofessional team. Children have more limited vocabularies than do adults and may use special words to describe bodily functions or a favourite blanket or toy. Teenagers often use words in unique ways that are unfamiliar to adults.

Denotative and Connotative Meaning. A single word can have several meanings. Individuals who use a common language share the denotative meaning: *baseball* has the same meaning for everyone who speaks English, but *code* denotes cardiac arrest to health care providers. The connotative meaning is the interpretation of a word’s meaning influenced by the thoughts, feelings, or ideas that people have about the word. Families who are told that a loved one is “in serious condition” may believe that death is near, but to the nurse *serious* may simply describe the nature of the condition. You need to select words carefully, avoiding terms that can be easily misinterpreted, especially when explaining a patient’s medical condition or therapy. Even a much-used phrase such as “I’m going to take your vital signs” can be unfamiliar to an adult or frightening to a child.

Pacing. Messages are conveyed more successfully when sent at an appropriate speed or pace. Speak slowly enough to enunciate clearly. Talking rapidly, using awkward pauses, or speaking slowly and deliberately can convey an unintended message. Long pauses and rapid shifts to another topic may be unsettling for a patient. Pacing is improved by thinking before speaking and by developing awareness of the cadence of your speech.

Intonation. Tone of voice dramatically affects the meaning of a message. Depending on intonation, even a simple question or statement can express enthusiasm, anger, concern, or indifference. To avoid sending unintended messages, be aware of your tone of voice. For example, patients may interpret a nurse’s tone of voice as condescending, and further communication may be inhibited. A patient’s tone of voice is also highly relevant to communication and may provide information about his or her emotional state or energy level.

Clarity and Brevity. Effective communication is simple, brief, and direct. Fewer words result in less confusion. You achieve clarity by speaking slowly, enunciating clearly, and using examples to make explanations easier to understand. Repeating important parts of a message also clarifies communication. Phrases such as “you know” or “okay?” at the end of every sentence detract from clarity, as well as professionalism. Brevity is achieved by using short sentences and words that express an idea simply and directly. “Where is your pain?” is much better than “I would like you to describe for me the location of your discomfort.”

Timing and Relevance. Timing is critical in communication. Even though a message is clear, poor timing can limit its effectiveness. For example, you should not begin routine teaching when a patient is in severe pain, is in emotional distress, or is distracted by pressing matters. Often the best time for interaction is when a patient expresses an interest in communicating. If messages are relevant or important to the situation at hand, communication is more effective. For example, when a patient is facing emergency surgery, discussing the risks of smoking is less relevant than explaining preoperative procedures.

Nonverbal Communication

Nonverbal communication makes use of all five senses and refers to transmission of messages that do not involve the spoken or written word. Researchers have estimated that approximately 7% of meaning is transmitted by words, 38% by vocal cues, and 55% by nonverbal body cues. Nonverbal communication serves to accent, complement, contradict, regulate, repeat, or substitute for verbal messages (Devito et al., 2011). Nonverbal communication is unconsciously motivated and therefore reflects a person’s intended meaning more accurately than spoken words (Austin & Boyd, 2010). When verbal and nonverbal communication are incongruous, the receiver usually “hears” the nonverbal message as the true message.

All kinds of nonverbal communication are important, but interpreting them is often difficult. Sociocultural background is a major influence on the meaning of nonverbal behaviour. Nonverbal messages between people of different cultures are easily misinterpreted. Because the interpretation of nonverbal behaviour is subjective, it is important to check its perceived meaning (Adler et al., 2008). Assessing nonverbal messages is an important communication skill that is highly consequential to patient assessment and nursing care (Austin & Boyd, 2010).

Personal Appearance. Personal appearance includes physical characteristics, facial expression, manner of dress and grooming, and adornments. These factors help communicate physical well-being, personality, social status, occupation, religion, culture, and self-concept. First impressions are largely based on appearance. Nurses learn to develop a general impression of patient health and emotional status through appearance, and patients develop a general impression of the nurse’s professionalism and caring in the same way.

Posture and Gait. Posture and gait are forms of self-expression. The ways that people sit, stand, and move reflect attitudes, emotions, self-concept, and health status. For example, an erect posture and a quick, purposeful gait communicate a sense of well-being and confidence. Leaning forward conveys attention. A slumped posture and a slow, shuffling gait may be indicative of depression, illness, discomfort, or fatigue.

Facial Expression. The face is the most expressive part of the body. Facial expressions convey emotions such as surprise, fear, anger, happiness, and sadness. Some people have an expressionless face, or flat affect, which reveals little about what they are thinking or feeling. An incongruent affect is a facial expression that does not match the content of a verbal message: for example, smiling when describing a sad situation. People are sometimes unaware of the messages their expressions convey. For example, a nurse may frown in concentration while doing a procedure and the patient may interpret this as anger or disapproval. Patients closely observe nurses. Consider the impact a nurse’s facial expression might have on a person who asks, “Am I going to die?” The slightest change in the eyes, lips, or facial muscles will reveal the nurse’s feelings. Although it is hard to control all facial expression, try to avoid showing shock, disgust, dismay, or other distressing reactions in the patient’s presence.

Eye Contact. People signal readiness to communicate through eye contact. Among many European and American people, maintaining eye contact during conversation shows respect and willingness to listen. Eye contact also allows people to closely observe one another. Lack of eye contact may indicate anxiety, defensiveness, discomfort, or lack of confidence in communicating. However, among some Asian and Aboriginal people, eye contact may be considered intrusive, threatening, or harmful. Eye movements can also communicate feelings and emotions. Standing above a person (looking downward) conveys authority, whereas interacting at the same eye level indicates equality in the relationship. Rising to the same eye level as an angry person communicates self-assertion.

Gestures. Gestures emphasize, punctuate, and clarify the spoken word, and may communicate volumes when speech is not possible. Gestures alone carry specific meanings and create messages. A finger pointed toward a person may communicate several meanings, but when accompanied by a frown and stern voice, the gesture conveys an accusation or a threat. Pointing to an area of pain may be more accurate than verbally describing the location.

Sounds. Sounds such as sighs, moans, groans, or sobs also communicate feelings and thoughts. When combined with other nonverbal communication, sounds help send messages. Sounds can be interpreted in several ways: sighing often suggests boredom or anxiety, moaning may convey pleasure or suffering, and crying may communicate happiness, sadness, or anger. You need to validate such nonverbal messages with the patient in order to interpret them accurately. Simply noticing the sound, such as stating “I hear you sighing so strongly” can impart concern and listening to what is not spoken.

Personal Space. Personal space is the need to gain, maintain, and defend one’s right to their space. Personal space is important because it provides people with a sense of identity, security, and control. Personal space can be distinguished and made visible to other people, as with a fence around a yard or a curtain around a bed in a hospital room. Personal space, however, is invisible and individual, connoting boundaries beyond the physical territory. Boundaries such as physical or emotional space can be defended just like another sort of fence or barrier. Some people choose when to open the gate of a fence, and others simply leave the boundary wide open, taking whatever comes through. When personal space becomes threatened, people respond defensively and communicate less effectively. Specific contexts may dictate whether the physical

or emotional distance between nurse and patient is appropriate. Because of the nature of caregiving, nurses often must move into a patient's personal space, even entering a more vulnerable zone in that personal space. For instance, when conducting an in-depth patient assessment or performing an intervention such as wound care, there is necessarily close personal and emotional contact between nurse and patient. Before entering into a patient's personal space, it is essential that you prepare both your patient and the environment. By explaining to your patient what you will do and preparing the environment for particular nursing interventions, your patient will recognize a shift toward the establishment of a therapeutic interaction. You need to convey confidence, gentleness, and respect for privacy, especially when your actions will require intimate contact or involve a patient's vulnerable zone. Box 17-3 provides examples of nursing actions within zones of personal space (Austin & Boyd, 2010) and zones of touch.

Symbolic Communication

Good communication requires awareness of **symbolic communication**, the verbal and nonverbal symbolism used to convey meaning. Art and music are forms of symbolic communication that nurses use to enhance understanding and promote healing. Lane (2006, 2008) found that creative expressions such as art, music, and dance have a healing effect on

patients. Patients reported decreased pain and greater joy and hope, and were often more open to communication when creative expressions were part of therapeutic communication.

Metacommunication

Metacommunication is a broad term that refers to all factors that influence how a message is perceived by other people (Arnold & Boggs, 2011). It is communication *about* communication (Devito et al., 2011) that reflects the relational aspects of messages (Adler et al., 2008) and helps people better understand what has been communicated. For example, a nurse observes a young patient holding his body rigidly erect, and his voice is sharp as he says, "Going to surgery is no big deal." The nurse replies, "You say having surgery doesn't bother you, but you look and sound tense. I'd like to help." Awareness of the tone of the verbal response and the nonverbal behaviour may result in further exploration of the patient's feelings and concerns.

Professional Nursing Relationships

The nurse's application of knowledge, understanding of human behaviour and communication, and commitment to ethical behaviour all contribute to the formation of professional relationships. The intention to promote caring and respect for other people will help you be more successful in establishing professional relationships.

Nurse-Patient Helping Relationships

Helping relationships are the foundation of clinical nursing practice. In such relationships, the nurse assumes the role of professional helper and comes to know the patient as an individual who has unique health care needs, human responses, and patterns of living. The relationship is therapeutic, promoting a psychological climate that facilitates positive change and growth. Therapeutic communication allows patients to achieve their health care-related goals and attain optimal personal growth (Arnold & Boggs, 2011). It includes an explicit time frame and a goal-directed approach, and confidentiality is an expected feature. The nurse establishes, directs, and takes responsibility for the interaction, and the patient's needs take priority over the nurse's needs. The relationship is also characterized by the nurse's nonjudgemental acceptance of the patient. Acceptance conveys a willingness to hear a message or to acknowledge feelings. It does not mean you always agree with the patient or approve of the patient's decisions or actions. A helping relationship between nurse and patient does not just happen; you create it through care, skill, and the development of trust.

The nurse-patient helping relationship is characterized by a natural progression of four goal-directed phases: preinteraction, orientation, working, and termination phases (Box 17-4). These phases often begin before the nurse meets the patient and continue until the caregiving relationship ends. Even a brief interaction is characterized by an abbreviated version of these four phases. For example, the student nurse gathers patient information to prepare in advance for caregiving, meets the patient and establishes trust, accomplishes health care-related goals through use of the nursing care process, and says goodbye at the end of the shift or when the patient leaves the unit.

Socializing is an important initial component of interpersonal communication. It helps people get to know one another

► BOX 17-3 Zones of Personal Space and Touch

Zones of Personal Space

Intimate Zone (0 to 45 cm)

Holding a crying infant
Performing physical assessment
Bathing, grooming, dressing, feeding, and toileting a patient
Changing a patient's dressing

Personal Zone (45 cm to 1 m)

Sitting at a patient's bedside
Taking the patient's health history
Teaching an individual patient
Exchanging information with health care staff at change of shift

Social Zone (1 to 4 m)

Participating in patient care rounds
Sitting at the head of a conference table
Teaching a class for patients with a specific disease
Conducting a family support group session

Public Zone (4 m and greater)

Speaking at a community forum
Testifying at a legislative hearing
Lecturing to a class of students

Zones of Touch

Social Zone (assess for permission to touch)

Hands, arms, shoulders, back

Consent Zone (consent needed)

Mouth, wrists, feet

Vulnerable Zone (consent and special care needed)

Face, neck, front of body

Intimate Zone (consent and great sensitivity needed)

Genitalia, rectum

► BOX 17-4 Phases of the Helping Relationship

Pre-Interaction Phase

Before meeting the patient, the nurse accomplishes the following tasks:

- Reviews available data, including the medical and nursing history
- Talks to other caregivers who may have information about the patient
- Anticipates health care concerns or issues that may arise
- Identifies a location and setting that will foster comfortable, private interaction with the patient
- Plans enough time for the initial interaction

Orientation Phase

When the nurse and patient meet and get to know one another, the nurse accomplishes the following tasks:

- Sets the tone for the relationship by adopting a warm, empathetic, caring manner
- Recognizes that the initial relationship may be superficial, uncertain, and tentative
- Expects the patient to test the nurse's competence and commitment
- Closely observes the patient and expects to be closely observed by the patient
- Begins to make inferences and form judgements about patient messages and behaviours
- Assesses the patient's health status
- Prioritizes the patient's problems and identifies the patient's goals
- Clarifies the patient's and nurse's roles
- Negotiates a contract with the patient that specifies who will do what
- Lets the patient know when to expect the relationship to be terminated

Working Phase

When the nurse and patient work together to solve problems and achieve goals, the nurse accomplishes the following tasks:

- Encourages and helps the patient to express feelings about his or her health
- Encourages and helps the patient to explore own feelings and thoughts
- Provides information that the patient needs to understand and change behaviour
- Encourages and helps the patient to set goals
- Takes actions to meet the goals set with the patient
- Uses therapeutic communication skills to facilitate successful interactions
- Uses appropriate self-disclosure and confrontation

Termination Phase

During the ending of the relationship, the nurse accomplishes the following tasks:

- Reminds the patient that relationship termination is near
- Evaluates goal achievement with the patient
- Reminisces about the relationship with the patient
- Separates from the patient by relinquishing responsibility for his or her care
- Facilitates a smooth transition for the patient to other caregivers as needed

* BOX 17-5

EVIDENCE-INFORMED PRACTICE GUIDELINE

Expanding Capacity for Positive Nurse–Patient Relationships Through Enhanced Communication Skills



Some students and nurses may claim: “I’m more technically inclined—communication and relationship skills are not really my strength.” While we all have particular strengths and weaknesses in our nursing practice, research shows us that, with skills, training, and practice, we can continue to enhance our capacity for communication with positive outcomes for our helping relationship and patient outcomes. Veronique Boscart, of the University of Toronto, conducted a study to evaluate the effect of a three-hour communication skills training session on the quality of verbal interactions between nursing staff and patients in a chronic care facility. Before the training, which included lecture, role playing, discussion, and reflection, the staff nurses in chronic care nursing practice were predominantly task-oriented and their style of communication was largely authoritative and advice giving in nature. Findings of the study revealed that, even several months following the training, with practice and attention on skills such as inquiry, listening, and validation, the positive qualities of nurse–patient interactions were greatly enhanced. Boscart’s study shows us that effective communication is something we can learn, and that with practice we can continue to expand our capacity for relational practice (Hartrick-Doane & Varcoe, 2005). Relational practice is an approach to communication that relies on the nurse’s capacity to be in relation to patients.

Source: Boscart, V. M. (2009). A communication intervention for nursing staff in chronic care. *Journal of Advanced Nursing*, 65(9), 1823–1832.

and relax. It is easy, superficial, and not deeply personal, whereas therapeutic interactions are often more difficult, intense, and uncomfortable. A nurse often uses social conversation to lay a foundation for a closer relationship: “Hi, Mr. Simpson. I hear it’s your birthday today. Happy birthday!” A friendly, informal, and warm communication style helps establish trust, but nurses must get beyond social conversation to talk about issues or concerns affecting the patient’s health. During social conversation, patients may ask personal questions about the nurse’s family, place of residence, and so forth. Students often wonder whether it is appropriate to reveal such information. The skillful nurse uses judgement about what to share and provides minimal information or deflects such questions with gentle humour and refocuses conversation back to the patient.

Creating a therapeutic environment depends on your ability to communicate, comfort, and help patients meet their needs. Comfort is crucial in the practice of nursing. Therapeutic interactions increase feelings of personal control by helping patients feel secure, informed, and valued. Optimizing personal control facilitates emotional comfort, which minimizes physical discomfort and promotes recovery (Boscart, 2009) (Box 17-5).

In a therapeutic relationship, nurses often encourage patients to share personal stories, which are called **narrative interactions**. Through narrative interactions, such as reminiscing with patients, you begin to understand the context of patients’ lives and learn what is meaningful from their

perspective (Shattell & Hogan, 2005). For example, a nurse asked a patient to tell about a time in his life when he had to make a difficult decision. The patient related the following story:

"When I was a young man, I worked on the family farm. An uncle died and left me some money. All of a sudden, I could afford to go to university, but Dad didn't want me to go because he needed me there. I had to decide whether to stay or go, and it was real hard because at first I just wanted to get away. I talked to our preacher, and he said it was up to me, to pray about it and do what my heart told me to. So I stayed. Oh, I've thought from time to time what I might have made of myself, but I never regretted it. I had a good life in farming."

From this brief story, the nurse understood that it was important to the patient to put his family's needs above his personal desires and that seeking spiritual guidance was an important component of his decision making. This same information may not have been revealed had the nurse used a standard history that usually elicits only short answers.

Collaboration between nurses and patients builds relationships and is based on principles of mutual gain and respect. It reflects a desire to satisfy the needs of both parties (Dubrin & Geerincx, 2009). **Collaborative communication** promotes personal responsibility, enables self-expression, and strengthens the patient's problem-solving ability. In addition to patient-nurse communication, nurses also communicate collaboratively with the interprofessional team. These skills are highly consequential to patient outcomes (Gottlieb & Feeley, 2006).

Nurse-Family Relationships

Many nursing situations, especially those in the community, require the nurse to form helping relationships with entire families. The same principles that guide one-to-one helping relationships also apply when the patient is a family unit; however, communication within families requires additional understanding of the complexities of family dynamics, needs, and relationships (see Chapter 19).

Interprofessional Team Relationships

Nurses function in roles that require interaction with interprofessional teams. Many elements of the nurse-patient helping relationship also apply to collegial relationships, which focus on accomplishing the work and goals of the clinical setting. Communication in such relationships may be geared toward team building, facilitating group process, collaboration, consultation, delegation, supervision, leadership, and management (see Chapter 10). You need a variety of communication skills, including presentational speaking, persuasion, group problem solving, providing performance reviews, and writing business reports.

Social and therapeutic interactions are needed between the nurse and members of the interprofessional team to build morale and strengthen relationships within the work setting. Within the interprofessional team, all members need friendship, support, guidance, and encouragement from one another to cope with the many stressors imposed by the demands of the health care context (Gottlieb & Feeley, 2006).

Nurse-Community Relationships

Many nurses form relationships with community groups by participating in local organizations, volunteering for community service, or becoming politically active. In a community-based practice, nurses establish relationships with their

community (Stanhope & Lancaster, 2012) (see Chapter 4). Communication in the nurse-community relationship includes neighbourhood newsletters, public bulletin boards, newspapers, radio, television, electronic information sites, and social media, whereby community health information is shared.

Elements of Professional Communication

Professional appearance, demeanour, and behaviour are important in establishing your trustworthiness and competence. They communicate the impression that you have assumed the professional helping role, are clinically skilled, and are focused on the patient. Professional behaviour should communicate warmth, friendliness, confidence, skill, and competence. Professionals speak in a clear, well-modulated voice, use good grammar, listen to other people, help and support colleagues, and communicate effectively. Being punctual, organized, well-prepared, and equipped for the responsibilities of the nursing role also communicate professionalism.

Courtesy

Common courtesy is part of professional communication. To practise courtesy, always greet and say goodbye to patients and knock on doors before entering. A courteous nurse will also state his or her purpose, address people by name, say "please" and "thank you" to members of the interprofessional team, and apologize for inadvertently causing distress. When a nurse is discourteous, he or she is perceived as rude or insensitive. Such behaviour sets up barriers between nurse and patient and causes friction among members of the interdisciplinary team.

Use of Names

Self-introduction is important. Failure to give a name, indicate status (e.g., student nurse, registered nurse, or licensed practical nurse), or acknowledge the patient creates uncertainty about the interaction and conveys a lack of commitment or caring. Making eye contact and smiling at other people communicates recognition. Addressing other people by name conveys respect for human dignity and uniqueness. Because using last names is respectful in most cultures, nurses usually use the patient's last name in the initial interaction, but they may use the first name in subsequent interactions at the patient's request. It is important to ask other people how they would like to be addressed and to honour their preferences. Using first names is appropriate for infants, young children, confused or unconscious patients, and close colleagues. Terms of endearment such as "honey," "dear," "Grandma," or "sweetheart" are inappropriate; they may be perceived as disrespectful and unprofessional. The use of plural pronouns such as "we" when referring to patients implies a loss of independence and may be interpreted as condescending. Referring to a patient by diagnosis, room number, or another attribute is demeaning and implies that you do not care enough to know the patient as an individual.

Trustworthiness

Trust entails relying on someone without doubt or question. Being trustworthy means following through on what you say you are going to do. To foster trust, you need to communicate warmth and demonstrate consistency, reliability, honesty, integrity, competence, and respect. Sometimes it is not easy for a patient to ask for help. Trusting another person involves

risk and vulnerability, but it also fosters open, therapeutic communication and enhances the expression of feelings, thoughts, and needs. Without trust, a nurse–patient relationship rarely progresses beyond social interaction and superficial care. Knowingly withholding key information, lying, or distorting the truth violates both legal and ethical standards of practice. Maintaining confidentiality and protecting a patient's privacy are also important aspects of communicating a trustworthy professional relationship. Sharing personal information or gossiping about other people communicates the message that you cannot be trusted and damages interpersonal relationships.

Autonomy and Responsibility

Autonomy is the ability to be self-directed and independent in accomplishing goals and advocating for other people. Nurses make choices and accept responsibility for the outcomes of their actions (Townsend, 2010). They take initiative in solving problems and communicate in a manner that reflects the importance and purpose of the therapeutic interaction (Arnold & Boggs, 2011). Recognizing the patient's autonomy is important to effective communication.

Assertiveness

Assertive communication allows individuals to act in their own best interests without infringing on or denying the rights of other people (Devito et al., 2011). Assertiveness conveys self-assurance and respect for other people (Austin & Boyd, 2010).

Nurses teach assertiveness skills to other people as a means of promoting personal health. Assertive people express feelings and emotions confidently, spontaneously, and honestly. They make decisions and control their lives more effectively than do nonassertive individuals. They can deal with criticism and manipulation by other people and learn to say no, set limits, and resist other people's efforts to impose guilt. For instance a nurse, when being asked to complete multiple tasks, may set limits by stating: "I will be able to get to that task, but only later today. Will that still work for you?"

Assertive responses are characterized by feelings of security, competence, power, optimism, and professionalism. They are good tools for dealing with criticism, change, negative conditions in personal or professional life, and conflict or stress in relationships. Assertive responses often contain "I" messages, such as "I want," "I need," "I think," and "I feel."

Communication Within the Nursing Process

In the following sections, the focus of the nursing process is on providing care for patients who need special assistance with communication. The section on implementation, to follow, contains examples of therapeutic communication techniques that are appropriate strategies for use in any interpersonal nursing situation.

❖ Assessment

Assessment of a patient's ability to communicate includes gathering data about the many contextual factors that influence communication. The word *context* refers to all the parts of a situation that help determine its meaning. A context

includes all the environmental factors that influence the nature of communication and interpersonal relationships. This includes the participants' internal factors and characteristics, the nature of their relationship, the situation prompting communication, the environment, and the sociocultural elements present (Beebe et al., 2011). Box 17-6 lists the contextual factors that influence communication. Understanding these contextual factors helps you make sound decisions during the communication process.

Physical and Emotional Factors

Assessing the psychophysiological factors that influence communication is especially important. Many altered health states and human responses limit communication. People with hearing or visual impairments have fewer channels through which to receive messages (see Chapter 47). Facial trauma, laryngeal cancer, tracheostomy, or endotracheal intubation

> BOX 17-6

Contextual Factors That Influence Communication

Psychophysiological Context

This refers to the internal factors that influence communication:

- Physiological status (e.g., pain, hunger, weakness, dyspnea)
- Emotional status (e.g., anxiety, anger, hopelessness, euphoria)
- Growth and development status (e.g., age, developmental tasks)
- Unmet needs (e.g., safety or security; love or belonging)
- Attitudes, values, and beliefs (e.g., meaning of illness experience)
- Perceptions and personality (e.g., optimistic or pessimistic, introverted or extroverted)
- Self-concept and self-esteem (e.g., positive or negative)

Relational Context

This refers to the nature of the relationship between the participants:

- Social, helping, or working relationship
- Level of trust between participants
- Level of caring expressed
- Level of self-disclosure between participants
- Shared history of participants
- Balance of power and control

Situational Context

This refers to the reason for the communication:

- Information exchange
- Goal achievement
- Problem resolution
- Expression of feelings

Environmental Context

This refers to the physical surroundings in which communication takes place:

- Privacy level
- Noise level
- Comfort and safety level
- Distraction level

Cultural Context

This refers to the sociocultural elements that affect the interaction:

- Educational level of participants
- Language and self-expression patterns
- Customs and expectations
- Media influences

often prevents movement of air past vocal cords or mobility of the tongue, which results in inability to articulate words. An extremely breathless person must use oxygen to breathe rather than speak. People with aphasia after a stroke or in late-stage Alzheimer's disease often cannot understand or form words. People with delirium cannot focus attentively, and those with dementia often cannot make sense of what is being said. Certain mental illnesses such as psychoses or depression cause patients to demonstrate flight of ideas (words do not keep up to rapidly changing thoughts), constant verbalization of the same words or phrases, a loose association of ideas, or slowed speech pattern. People who are highly anxious are sometimes unable to perceive environmental stimuli or hear explanations. Unresponsive or heavily sedated people cannot send or respond to verbal messages.

Review of the patient's medical record helps provide relevant information about the patient's ability to communicate. Through the health history and physical examination, you document physical barriers to speech, neurological deficits, and pathophysiological conditions that affect hearing or vision. Reviewing the patient's medication record is also important. For example, opiates, antidepressants, neuroleptics, hypnotics, or sedatives may cause a patient to slur words or use incomplete sentences. The nursing progress notes may reveal other factors that contribute to communication difficulties, such as the absence of family members who could provide more information about a confused patient.

Assessment should include communicating directly with patients to provide information about their ability to attend to, interpret, and respond to stimuli. If patients have difficulty communicating, it is important to assess the effects of the problem. Patients who cannot communicate effectively will often have difficulty expressing their needs and responding appropriately to the environment. A patient who is unable to speak is at risk for injury unless the nurse identifies an alternative communication method. Assistive communication tools and devices may support the nurse in assessment and communication more generally. Some of these tools involve assistive technologies, whereas others may be more simplistic, for example, nonverbal techniques such as simple sign language, lip reading, and so on (Finke et al., 2008). If barriers make it difficult to communicate directly with the patient, then family or friends become important sources of collateral information about the patient's communication patterns and abilities, as well as for general assessment.

Developmental Factors

Aspects of a patient's growth and development also influence nurse-patient communication. For example, an infant's self-expression is limited to crying, body movement, and facial expression, whereas most older children express their needs more directly, through speech and specific actions such as pointing. Nurses adapt communication techniques to the developmental needs of infants and children (see Chapters 21 and 22). Communication with children and their parents requires special considerations. It is important to include the parents, child, or both as sources of information about the child's health, depending on the child's age.

Advancing age may also affect communication abilities. According to Statistics Canada, older adults represent the fastest-growing sector of the population, of which 6 to 12% will experience speech, language, or voice difficulties (Canadian Association of Speech-Language Pathologists and Audiologists, 2011). Although some older adults have varied

► BOX 17-7 Focus on Older Adults

Tips for Improved Communication With Older Adults Who Have Communication Needs or Barriers

- Capture the patient's attention before speaking.
- Check for hearing aids and glasses.
- Introduce yourself.
- Choose a quiet, well-lit environment, and minimize visual and auditory distractions.
- Face the patient, and use facial expressions and gestures as needed.
- Amplify your voice if necessary, but do not shout because it distorts sound and your facial expression could be misinterpreted. Speak clearly at a moderate rate.
- Allow time for the patient to respond. Do not assume the patient is being uncooperative if the patient makes no response or a delayed response.
- Give patients time to ask questions and clarify responses.
- Whenever possible, ask a family member or caregiver to join you and the patient in the room. Such people are usually most familiar with the patient's communication patterns and can assist in the communication process.

communication barriers, nurses need to avoid the patronizing tone of what is referred to as “**elderspeak**,” or condescending baby talk. Rather, nurses should communicate simply, clearly, and with respect to provide humanistic care for the unique needs of their older patients (Cunningham & Williams, 2007). Box 17-7 highlights tips for communicating with older adults who have communication needs and barriers. These tips can be applied to all patients with communication problems.

Sociocultural Factors

Culture, like communication more broadly, is a process that is experienced between people in a relationship. Awareness of the relational process of culture, beginning with an appreciation of one's own individual perspective, power, and privilege, can facilitate communication and understanding between nurses and their patients (see Chapter 9). Nurses can communicate in what is considered “culturally safe” **relational practice** (Hartrick Doane & Varcoe, 2005) by responding to their patients and families, following their lead, appreciating their unique contexts, acknowledging difference, and engaging with the relational capacities mentioned earlier.

Make a conscious effort to avoid interpreting messages from your own cultural perspective and to consider communication within the context of the patient's background.

Gender

Gender is another factor that influences how people think, act, feel, and communicate. Male and female communication patterns tend to differ, which can sometimes create barriers to effective communication (Beebe et al., 2011). Males tend to use less verbal communication but are more likely to initiate conversations and address issues directly. Females tend to disclose more personal information, use more active listening, and respond in ways that encourage continued conversation. A male nurse might say to his colleague, “Help me turn Jeremy.” A female nurse might say, “Jeremy needs to be turned,” expecting her colleague to understand the implied request for help.

To practise gender sensitivity in communication, recognize the differences in male and female communication patterns to

avoid misinterpreting messages sent by someone of the opposite gender. Conversations with sexual overtones, gender-denigrating jokes, and male–female stereotyping communicate a lack of professionalism.

❖Nursing Diagnosis

Most individuals experience difficulty with some aspect of communication. People who are free of illness or disability may lack skills in attending, listening, responding, and self-expression. Often, nurses will direct care toward individuals who experience more serious communication impairments, though support for everyone's communication regardless of abilities is part of the nursing process.

The primary nursing diagnostic label used to describe the patient with limited or no ability to communicate verbally is *impaired verbal communication*. This is the state in which the ability to receive, process, transmit, and use symbols is decreased or absent (Doenges et al., 2010). Defining characteristics include the inability to articulate words, inappropriate verbalization, difficulty forming words, and difficulty in comprehending, which the nurse clusters together to form the diagnosis. This diagnosis is useful for a wide variety of patients with special problems and needs related to communication, such as impaired perception, reception, and articulation. Although a patient's primary problem may be impaired verbal communication, the associated difficulty in self-expression or altered communication patterns may also contribute to other nursing diagnoses:

- Anxiety
- Social isolation
- Ineffective coping
- Compromised family coping
- Powerlessness
- Impaired social interaction

Contributing and contextual factors for a nursing diagnosis focus on the origins of the communication disorder. In the case of impaired verbal communication, these are physiological, mechanical, anatomical, psychological, social/cultural, or developmental in nature. Accuracy in the identification of related factors is necessary in order to select interventions that can effectively resolve the problem. For example, the diagnosis of *impaired verbal communication related to cultural diversity* would be managed very differently than the diagnosis of *impaired verbal communication related to deafness*.

❖Planning

Once you have identified the origins and context of the patient's communication impairment, you must consider several factors as you design a responsive approach and nursing care plan. Motivation is a factor in improving communication; patients often must be encouraged to try different approaches. It is especially important to involve the patient and family in decisions about the plan of nursing care to determine whether suggested methods are acceptable. Patients and families must be patient with themselves and each other when learning new skills if communication is to be effective. When the focus is on practising communication, in some instances arranging for a quiet, private place, free of distractions may be helpful. Communication aids, such as a writing board for a patient with a tracheostomy, an electronic communication device for a patient with autism, or a special call system for a patient with paralysis, may enhance communication.

Goals and Outcomes

The primary goal of nursing interventions is to facilitate the development of trust between the patient and members of the health care team. It is important to identify expected outcomes for all patients, particularly when impaired communication is a concern. Outcomes are specific and measurable and provide the means to determine whether the broader goal is met. For example, outcomes for the patient might be as follows:

- The patient initiates conversation about diagnosis or health care problem.
- The patient is able to attend to appropriate stimuli.
- The patient conveys clear and understandable messages with family members and members of the health care team.
- The patient expresses increased satisfaction with the communication process.

At times, you will care for well patients whose difficulty in sending, receiving, and interpreting messages interferes with healthy interpersonal relationships. In this case, impaired communication may be contributing to other nursing diagnoses such as *impaired social interaction* or *ineffective coping*. In such cases, you need to plan interventions to help your patients improve their communication skills. For example, you could model effective communication techniques and provide feedback regarding the patient's communication. Role playing helps patients rehearse situations in which they have difficulty communicating. Expected outcomes for a patient in this situation might include demonstrating the ability to appropriately express needs, feelings, and concerns; communicating thoughts and feelings more clearly; engaging in appropriate social conversation with peers and staff; and increasing feelings of autonomy and assertiveness.

Setting of Priorities

It is essential for the nurse to be available for communication with some immediacy so that the patient is able to express any pressing needs or problems. This may involve an intervention as simple as keeping a call light within reach for a patient restricted to bed or providing a communication augmentative device for the patient to use (e.g., message board, Braille keyboard). When you plan to have lengthy interactions with a patient, it is important to address physical care priorities (i.e., pain or elimination needs) first, so that the patient is comfortable and the discussion is uninterrupted.

Continuity of Care

To ensure an effective care plan, you may need to collaborate with other members of the interprofessional team who have expertise in communication strategies. Speech therapists help patients with aphasia, interpreters may be of use to communicate with patients who speak a diversity of languages, and psychiatric nurse specialists support communication with patients in crisis, those who may be experiencing altered moods, behaviours, anxiety states, or disordered thoughts and perceptions (Austin & Boyd, 2010).

❖Implementation

In carrying out any care plan, nurses use communication techniques that are appropriate for the patient's individual needs. Before learning how to adapt communication methods to help patients with serious communication impairments, it is necessary to learn the communication skills and approaches that serve as the foundation for professional communication. It is

also important to understand approaches that create barriers to effective interaction (Devito et al., 2011).

Therapeutic Communication Techniques

Therapeutic communication techniques are specific responses that encourage the expression of feelings and ideas and convey acceptance and respect. By learning these techniques, you develop awareness of the variety of nursing responses available for use in different situations. Although some of the techniques seem artificial at first, skill and comfort in using them increase with practice. Tremendous satisfaction will result from the development of therapeutic relationships and achievement of desired patient outcomes.

Active Listening. Active listening means to be attentive to what the patient is saying both verbally and nonverbally. It enhances trust and facilitates patient communication because it demonstrates acceptance and respect for the patient. Several nonverbal skills facilitate active listening. They can be identified by the acronym *SOLER* (Townsend, 2010):

- S:** *Sit* facing the patient. This posture indicates that you are there to listen and are interested in what the patient is saying.
- O:** Keep an *open* posture (i.e., keep arms and legs uncrossed). This posture suggests that you are receptive (“open”) to what the patient has to say. A “closed” position may convey a defensive attitude, possibly invoking a similar response in the patient.
- L:** *Lean* toward the patient. This posture indicates that you are involved and interested in the interaction.
- E:** Establish and maintain intermittent *eye contact*. This behaviour conveys your involvement in and willingness to listen to what the patient is saying. Absence of eye contact or shifting of the eyes indicates that you are not interested in what the patient is saying.
- R:** *Relax*. It is important to communicate a sense of being relaxed and comfortable with the patient. Restlessness communicates a lack of interest and also conveys a sense of discomfort that may extend to the patient.

Sharing Observations. Nurses make observations by commenting on how the patient looks, sounds, or acts. Stating observations often helps the patient communicate without the need for extensive questioning, focusing, or clarification. This technique helps start a conversation with quiet or withdrawn people. Do not state observations that might anger, embarrass, or upset the patient, such as telling someone “You look a mess!” Even if such an observation is made with humour, the patient may be offended or feel belittled.

Sharing observations differs from making assumptions, which means drawing unwarranted conclusions about the patient without validating them. Making assumptions puts the patient in the position of having to contradict the nurse. Examples might include the nurse interpreting fatigue as depression or assuming that untouched food indicates lack of interest in meeting nutritional goals. Making observations is a gentler approach of simply witnessing without judgement about what might be happening: “You look tired” is very different from the attached judgement of “You look tired. Were you up all night?”; “You seem different today” is different from “You seem much better today” and simply stating “I see you are wearing lipstick today” conveys something quite distinct from “You look very beautiful.”

Sharing Empathy. Empathy is the ability to emotionally and intellectually understand another person’s reality, to

accurately perceive unspoken feelings, and to communicate this understanding to the other person (Devito et al., 2011). Empathy is expressed when you seek to explore the perspective of another person. Cultivating an ability to empathize requires patience, a sense of curiosity, and a willingness to understand a patient’s context and viewpoint. This requires a relational approach starting with a willingness to open the relational space and take action. Empathy can also be expressed in relational communication through strong **intentionality**, or a consciousness of the purpose and intention of one’s communication, and reflexivity, which is an attention to one’s responses and feelings as they influence communication and decision making (Hartick Doane & Varcoe, 2007). Such empathic understanding requires you to be self-aware, sensitive, and imaginative, especially if you have not had similar experiences. Statements reflecting empathy are highly effective because they indicate you heard the emotional content, as well as the factual content, of the communication. Empathic statements are neutral and nonjudgemental and help to provide validation to the patient and establish a trusting relationship. For example, to an angry patient who has limited mobility after a stroke, you might say, “It must be very frustrating to know what you want to do and not be able to do it.”

Sharing Hope. You must recognize that hope is essential for healing, and you must learn to communicate a “sense of possibility” to other people. Appropriate encouragement and positive feedback are important in fostering hope and self-confidence and for helping people achieve their potential and reach their goals. You can instill hope by commenting on the positive aspects of the other person’s behaviour, performance, or response. Sharing a vision of the future is a way of reimagining their situation, which can foster hopefulness and creativity through communication. Reminding patients of their internal resources and coping abilities also conveys a sense of hope and strengthens relational communication. You can reassure patients that many kinds of hope exist, and that meaning and personal growth can arise from illness experiences. For example, you might say to a patient discouraged about progressive changes in mobility: “I have seen your courage and creativity in the past and am curious about how you might be preparing for the changes in your abilities now.”

Sharing Humour. Humour is an important but under-used resource in nursing communication (Wilkins & Eisenbraun, 2009). Research suggests that a sense of humour is a useful coping strategy for patients, health care providers, and families and an essential communication tool for nurses as it can strengthen the helping relationship (Wanzer et al., 2005). Humour has been shown to have positive effects on both a person’s emotional and physiological state (Tse et al., 2010; Wilkins & Eisenbraun, 2009).

Humour is not without potential communication challenges. It is common for nurses to care for patients from diverse cultures. When nurses interact with patients who communicate in languages other than their own, it is important to acknowledge that nuances of jokes and humour can be misunderstood. Similarly, when either a nurse or a patient attempts to communicate humour while speaking in a language other than their most familiar, mistakes and misunderstandings may also occur. Regardless of culture or background, what is humorous to one person simply may not be funny to another.

Health care providers sometimes use negative humour as a way to deal with extreme tension and stress in the workplace,

but it can be problematic. What is referred to as “grey zone” humour constitutes behaviours like teasing, practical jokes, and sarcasm. “Gallows humour” speaks to the more grim or dark style, often used in very difficult situations to relieve anxiety or release anger to transform negative feelings into something lighter in mood. This humour frequently includes topics such as body fluids, body parts, physical or slapstick humour, and so on (Buxman, 2008). This style of humour has a high potential to be perceived as tasteless and lacking in caring by people uninvolved in the situation. When nurses use this style of humour within earshot of patients or their loved ones, great emotional distress can result. When used judiciously and carefully, a nurse’s use of humour in communication with patients can be a highly therapeutic strategy.

Sharing Feelings. Emotions are subjective feelings that result from thoughts and perceptions. Feelings are not right, wrong, good, or bad, although they may be experienced as pleasant or unpleasant. Even though withholding feelings can increase stress and exacerbate illness, people may do so in an attempt to ward off unpleasant feelings or adhere to expectations of others or societal norms. You can gently help patients express their emotions by making observations, acknowledging feelings, encouraging communication, giving them permission to express “negative” feelings, and modelling healthy emotional self-expression. At times, patients direct anger or frustration prompted by their illness toward nurses, who should not take such expressions personally. Acknowledging patients’ feelings demonstrates empathy and communicates that you have listened to and understood the emotional aspects of their situation.

When you care for patients, you must be aware of your own emotions because strong feelings may be difficult to hide. Students may wonder whether it is helpful for nurses to share their feelings with patients. Sharing emotion makes nurses seem more human and often brings people closer. It is appropriate to share feelings of caring, or even cry with other people, as long as you are in control of the expression of those feelings and do so in a way that does not burden the patient or break confidentiality. Patients are perceptive and can sense a nurse’s emotions. It is usually inappropriate, and may interfere with assessing and caring for the patient, to discuss one’s negative personal emotions such as anger or sadness with patients. A social support system of colleagues is helpful, as are strategies for supervision and debriefing; employee assistance programs, peer group meetings, and the use of interprofessional teams such as social work and pastoral care may provide avenues for nurses to safely express feelings away from patients.

Using Touch. Many patients experience feelings of isolation related to their personal and social contexts, as well as the increasing technological features of society more generally. Thus, nurses are required, more than ever, to communicate a human connection to their patients (see Chapter 18). Touch is an important element of communication that conveys many messages, such as affection, emotional support, encouragement, tenderness, and personal attention. People have unique perspectives on touch based upon their past experiences and health conditions. For instance, patients in psychosis may misinterpret touch as threatening; patients who have experienced abusive or violent contact from others may be fearful of even well-intentioned touch from a nurse. Touch may also be misinterpreted as sexual or romantic by some patients (Gleeson & Higgins, 2009). In response to the patient’s lead, holding a hand or offering a gentle touch on the shoulder may, however,



Figure 17-2 The nurse uses touch to communicate.

be an expression of comfort, reassurance, and care for some, and may convey empathy in situations when words are insufficient (Arnold & Boggs, 2011) (Figure 17-2).

Students may initially find giving intimate care stressful, especially when caring for patients of the opposite gender. Students learn to cope with intimate contact by changing their perception of the situation. Because much of what nurses do involves touch, you must learn to be sensitive to people’s reactions to touch and communicate effectively when touch is required. Touch should be as gentle or as firm as needed and delivered in a comforting, nonthreatening manner. In certain situations, you must withhold touch, for example, when interacting with highly suspicious or angry people who may respond negatively or even violently when touched.

Using Silence. It takes time and experience to become comfortable with silence. Most people have a natural tendency to fill silences with words, but sometimes silences serve the need for time for the nurse and patient to observe one another, to really *listen*, to sort out their feelings, think about how to say things, and consider what has been communicated. Silence is an important skill in the capacity to *let be* and to live with *complexity and ambiguity* (Hartrick Doane & Varcoe, 2005). Silence may provide sufficient space for some patients to talk freely without the constraint of relying upon particular patterns of question and answer. Silence allows patients to think and gain insight into their situations crucial to *reimagining* and hope. In general, you should allow the patient to initiate when the silence is to be broken (Austin & Boyd, 2010).

Silence is particularly useful when people are confronted with decisions that require much thought. For example, silence may help a patient gain confidence needed to share the decision to refuse medical treatment. Silence also allows the nurse to attend to nonverbal messages such as worried expressions or loss of eye contact. Remaining silent demonstrates the nurse’s patience and responsiveness to the patient who may be unable to reply quickly. Silence may be especially therapeutic during times of profound sadness or grief (Box 17-8).

Providing Information. Providing relevant information that the patient needs or wants to know empowers the patient to make informed decisions, experience less anxiety, and feel safe and secure. It is also an integral aspect of health teaching. Hiding information from patients is not usually helpful, particularly when they are seeking it. If a physician withholds information, you need to clarify the reason with the physician.

BOX 17-8 NURSING STORY

Communication With a Dying Patient

A young third-year nursing student who was assigned to care for a dying patient came to me, as her nursing instructor, to discuss her assignment. The student nurse appeared to be anxious and distraught and was tearful. She requested a change of assignment and, when asked why she felt she needed to be moved, she stated: "I just don't know what I'm supposed to be *doing* with her. She is asking for her family, but they aren't there. She's dying and I just don't know what to do to *help* her." I asked the student what she was doing while she was in the room and she said: "I'm just sitting there holding her hand and listening to her when she's awake. She really isn't talking much, and she drifts off to sleep a lot, but she's afraid of being left alone, so I'm just holding her hand and letting her know I'm there, even when she's sleeping; that way she'll know she's not alone whenever she wakes up. I make sure she's comfortable but I don't know what else she needs. I'm just not *doing* anything." As I looked into her tear-filled eyes, I simply asked her, "So, what makes you think you aren't doing anything?" Communication involves so much more than dialogue. In this case, communication involved very little verbal interaction; it involved active listening, shared empathy, comfort care, gentle touch, silence, presence, and "being with," as the student compassionately accompanied the patient through her final stage of life and assisted with her transition into death.

Patients have a right to know about their health status and what is happening in their environment. Information of a distressing nature needs to be communicated with sensitivity, at a pace appropriate to what the patient can absorb, and in general terms at first: "John, your heart sounds have changed from earlier today, and so has your blood pressure. I'll let your doctor know." It is important to provide information that enables patients to understand what is happening and what to expect: "Ms. Evans, John is getting an echocardiogram right now. This test uses painless sound waves to create a moving picture of his heart structures and valves and should tell us what is causing his murmur."

Clarifying. To check whether understanding is accurate, restate an unclear or ambiguous message to clarify the sender's meaning or ask the other person to rephrase it, explain further, or give an example of what he or she means. Without clarification, you may make invalid assumptions and miss valuable information. Despite efforts at paraphrasing, you sometimes will still not understand the patient's message and should let the patient know that this is the case: "I'm not sure I understand what you mean by 'sicker than usual.' What is different now?"

Focusing. Focusing centres on key elements or concepts of a message. If conversation is vague or rambling or if patients begin to repeat themselves, focusing is a useful technique. Do not use focusing if it interrupts patients while they are discussing an important issue. Rather, use focusing to guide the direction of conversation to important areas: "We've talked a lot about your medications, but let's look more closely at the trouble you're having in taking them on time."

Paraphrasing. Paraphrasing is restating another person's message more briefly in your own words. Through paraphrasing, you let the patient know you are actively involved in the search for understanding. Practice is required to paraphrase accurately. If the meaning of a message is changed or distorted through paraphrasing, communication becomes

ineffective. For example, a patient may say, "I've been overweight all my life and never had any problems. I can't understand why I need to be on a diet." Paraphrasing this statement by saying, "You don't care if you're overweight or not," is incorrect. It would be more accurate to say, "I hear you saying that you're not convinced you need a diet because you've stayed healthy."

Asking Relevant Questions. Nurses ask relevant questions to seek information needed for decision making. You should ask only one question at a time and fully explore one topic before moving to another area. During patient assessment, questions should follow a logical sequence and proceed from general to more specific. Open-ended questions allow the patient to take the conversational lead and introduce pertinent information about a topic. For example, "What's your biggest concern at the moment?" Focused questions are used when more specific information is needed in an area: "How has your pain affected your life at home?" Allow patients to fully respond to an open-ended question before asking more focused questions. Closed-ended questions elicit yes, no, or one-word responses: "How many times a day are you taking pain medication?" Although they are helpful during assessment, they are generally less useful during therapeutic exchanges.

Asking too many questions is sometimes dehumanizing. Seeking primarily factual information does not allow you or your patient to establish a meaningful relationship or deal with important emotional issues. It is a way to ignore uncomfortable areas in favour of more comfortable, neutral topics. A useful exercise is to try conversing without asking the other person a single question. By giving general leads ("Tell me about it"), making observations, paraphrasing, focusing, providing information, and so forth, you may discover important information that would have remained hidden if communication were limited primarily to questions.

Summarizing. Summarizing is a concise review of key aspects of an interaction. Summarizing brings a sense of satisfaction and closure to an individual conversation and is especially helpful during the termination phase of a nurse-patient relationship. By reviewing a conversation, participants focus on key issues and add relevant information as needed. Beginning a new interaction by summarizing a previous one helps the patient recall topics discussed and shows the patient that you have analyzed the communication. Summarizing also clarifies expectations, as in this example of a nurse manager who has been working with a dissatisfied employee: "You've told me a lot of reasons about why you don't like this job and how unhappy you've been. We've also come up with some possible ways to make the situation better, and you've agreed to try some and let me know if any of them help."

Self-Disclosure. Self-disclosures are subjectively true, personal experiences about the self that are intentionally revealed to another person. This is not therapy for the nurse; rather, it shows patients that you understand and that their experiences are not unique. You may choose to share experiences or feelings that are similar to those of the patient and emphasize both the similarities and differences. This kind of self-disclosure is indicative of the closeness of the nurse-patient relationship and involves a particular kind of respect for the patient. It is offered as an expression of genuineness and honesty and is an aspect of empathy (Austin & Boyd, 2010). Self-disclosure should be relevant and appropriate and made to benefit the patient. Self-disclosure should be used sparingly so that the patient remains the focus of the interaction: "That happened to me once, too. I was devastated . . . I went for

counselling, and it really helped. What are your thoughts about seeing a counsellor?"

Confrontation. To confront someone in a therapeutic way, you help the other person become more aware of inconsistencies in his or her feelings, attitudes, beliefs, and behaviours (Austin & Boyd, 2010). This technique improves patient self-awareness and helps the patient recognize growth and deal with important issues. Confrontation should be used only after you have established a trusting relationship with the patient, and it requires gentleness and sensitivity: "You say you've already decided what to do, but you're still talking a lot about your options."

Nontherapeutic Communication Techniques

Certain communication techniques hinder or damage professional relationships. These specific techniques are referred to as *nontherapeutic* or *blocking* and will often cause recipients to activate defences to avoid being hurt or negatively affected. Nontherapeutic techniques tend to discourage further expression of feelings and ideas and may engender negative responses or behaviours in other people.

Asking Personal Questions. Asking personal questions that are not relevant to the situation but simply to satisfy your curiosity (e.g., "Why don't you and John get married?") is not appropriate professional communication. Such questions are invasive and unnecessary. If patients wish to share private information, they will. To learn more about the patient's interpersonal roles and relationships, ask a question such as "How would you describe your relationship with John?"

Giving Personal Opinions. When you provide a personal opinion (e.g., "If I were you, I'd put your mother in a long-term care facility"), it takes decision making away from the patient. It inhibits spontaneity, stalls problem solving, and creates doubt. Personal opinions differ from professional advice. At times, patients need suggestions and help to make choices. Suggestions should be presented to patients as options because the final decision rests with the patient. Remember that the problem and its solution belong to the patient. A much better response is "Let's talk about what options are available for your mother's care."

Changing the Subject. When another person is trying to communicate something important, changing the subject (e.g., "Let's not talk about your problems with your job. It's time for your walk") is rude and shows a lack of empathy and mutuality. It tends to block further communication, and the sender then withholds important messages or fails to openly express feelings. Thoughts and spontaneity are interrupted, ideas become tangled, and information provided may be inadequate. In some instances, changing the subject serves as a face-saving manoeuvre. If this happens, reassure the patient that you will return to his or her concerns: "After your walk, let's talk some more about what's going on with your job."

Automatic Responses. Stereotypes (e.g., "Older adults are always confused" or "Administration doesn't care about the staff") and labels are generalized beliefs held about people. A cliché is a generalizing comment such as "You can't win them all" that tends to belittle the other person's feelings and minimize the importance of his or her message. These automatic responses communicate that you are not taking concerns seriously or responding thoughtfully. Another kind of automatic response is parroting, repeating what the other person has said, word for word. Parroting is easily overused and is not as effective as paraphrasing. Automatic remarks about

other people lead to assumptions and closed communication that reflects poor nursing judgement and may well threaten nurse-patient or nurse-team relationships. Nurses may get in the habit of these automatic responses as a defence mechanism or as a way to compartmentalize and organize their work.

A nurse who is excessively task-oriented automatically makes the task or procedure the entire focus of interaction with patients, missing opportunities to communicate with patients as individuals and meet their needs. When you first perform technical tasks, you may have difficulty integrating therapeutic communication because of your need to focus on the procedure. In time, you will learn to integrate communication with high-visibility tasks and accomplish several goals—including relational communication—simultaneously. Self-awareness is crucial (Austin & Boyd, 2010).

False Reassurance. When a patient is seriously ill or distressed, you may be tempted to offer hope to the patient with statements such as "Don't worry, everything will be all right"; "You'll be fine"; or "You have nothing to worry about." When a patient is reaching for understanding, false reassurance discourages open communication. Offering reassurance not supported by facts or based in reality does more harm than good. Although you may be attempting to be kind, such reassurance has the secondary effect of helping you avoid the patient's distress, tends to block conversation, and discourages further expression of feelings. A more facilitative nursing response is "It must be difficult not to know what the surgeon will find. What might be helpful to you at this time?"

Sympathy. Sympathy is concern, sorrow, sadness, or pity felt for the patient generated by personal identification with the patient's needs (Grover, 2005). Sympathy is a subjective vision of another person's viewpoint that prevents a clear perspective of the issues confronting that person. If you over-identify with the patient (e.g., "I'm so sorry about your mastectomy; it must be terrible to lose a breast"), you will lose objectivity and be unable to effectively help the patient work through his or her situation (Arnold & Boggs, 2011). Although sympathy is a compassionate response to another's situation, it may not be as responsive and therapeutic as empathy. A more empathic approach is "The loss of a breast is a major change. How do you think it will affect your life?"

Asking for Explanations. You may be tempted to ask your patient to explain why he or she believes, feels, or has acted in a certain way (e.g., "Why are you so anxious?"). Patients frequently interpret "why" questions as accusations or think you already know the reason and are simply testing them. "Why" questions tend to interrupt patients' descriptions of their feelings and experience and cause them to refocus their energy into intellectual or defensive responses (Shattell & Hogan, 2005). Regardless of your motivation, "why" questions can cause resentment, insecurity, and mistrust. If you require additional information, it is best to phrase questions to avoid using "why": "You seem upset. What's on your mind?" or "Tell me about how you are feeling today compared to yesterday" is more likely to help the anxious patient to communicate.

Approval or Disapproval. Do not impose your personal attitudes, values, beliefs, and moral standards on other people while in the professional helping role (e.g., "You shouldn't even think about assisted suicide; it's not right"). Other people have the right to speak their minds and make their own decisions. Judgemental responses often contain terms such as *should*, *ought*, *good*, *bad*, *right*, and *wrong*. Agreeing or disagreeing conveys the subtle message that you are making value

judgements about the patient's decisions. Approving implies that the behaviour being praised is the only acceptable one. Often the patient shares a decision not in an effort to seek approval but to provide a means to discuss feelings. On the other hand, disapproving implies that the patient needs to meet your expectations or standards. Instead, help patients explore their own beliefs and decisions. The nursing response "I'm surprised you're considering assisted suicide; tell me more" gives the patient a chance to express ideas or feelings without fear of being judged.

Defensive Responses. Becoming defensive in response to criticism (e.g., "No one here would intentionally lie to you") implies that the other person has no right to an opinion. The sender's concerns are ignored when you focus on the need for self-defence, defence of the health care team, or defence of other people. When patients express criticism, it is important to listen to what they have to say. Listening does not imply agreement. To discover reasons for the patient's anger or dissatisfaction, you must listen without defensiveness or judgement and criticism. By avoiding defensiveness, you can defuse anger and uncover deeper concerns: "It sounds as if you believe people have been dishonest with you. That must make it difficult for you to trust anyone."

Passive or Aggressive Responses. Passive responses (e.g., "Things are bad, and I can't do anything about it") serve to avoid conflict or sidestep issues. They reflect feelings of sadness, depression, anxiety, powerlessness, and hopelessness. Aggressive responses (e.g., "Things are bad, and it's all your fault") provoke confrontation at the other person's expense and reflect feelings of anger, frustration, resentment, and stress. When nurses lack assertiveness skills, they may also use triangulation, complaining to a third party rather than confronting the problem or expressing concerns directly to the source. This lowers team morale and draws other people into the conflict situation. Assertive communication establishes boundaries and expectations without the blame or judgement implied in passive and aggressive responses. An assertive approach imparts intention and action that will support the ongoing professional therapeutic relationship.

Arguing. Challenging or arguing against perceptions (e.g., "How can you say you didn't sleep a wink, when I heard you snoring all night long?") denies that they are real and valid to the other person. They imply that the other person is lying, misinformed, or uneducated. Skillful nurses give information or present reality in a way that avoids argument: "You feel as if you didn't get any rest at all last night, even though I thought you slept well because you seemed peaceful when I checked your room during the night."

Adapting Communication Techniques for the Patient With Special Needs

The temporary or permanent loss of the ability to speak is extremely traumatic to an individual. It is important to assess a patient's alternative communication method and whether it causes anxiety in the patient. Patients who have undergone laryngectomies often write notes, use communication boards or laptop computers, speak with mechanical vibrators, or use esophageal speech. Patients with endotracheal or tracheostomy tubes have a temporary loss of speech. Most use a notepad to write their questions and requests. However, the patient may become incapacitated and unable to write messages. You need to determine whether the patient has developed a sign language or system of symbols to communicate

needs. If not, you may need to assist the patient in developing a meaningful method during a new or temporary loss of communication.

Interacting effectively with patients who have conditions that impair communication requires special thought, sensitivity, creativity, and responsiveness. Such patients benefit greatly when you adapt communication techniques to their unique circumstances or developmental level. For example, if you are caring for a patient with impaired verbal communication related to mechanical ventilation, you can provide a visual table or construct a coded hand signal to exchange necessary communication. You and the patient can use such tools to help communicate for assessment and interventions. Similar techniques can be used with patients suffering with aphasia or some dementias.

Patients with **aphasia** may be unable to produce or understand language. **Expressive aphasia**, a motor type of aphasia, is the inability to name common objects or to express simple ideas in words or writing. For example, a patient may understand a question but be unable to express an answer. **Sensory or receptive aphasia** is the inability to understand written or spoken language. The patient may be able to express words but is unable to understand the questions or comments of others. **Global aphasia** is the inability to understand language or communicate orally.

You need to direct nursing actions toward meeting the goals and expected outcomes identified in the plan of care, addressing both the communication impairment and its contributing factors. Box 17-9 lists many methods available to encourage, enhance, restore, or substitute for verbal communication. You must be sure that the patient is physically able to use the chosen method and that it does not cause frustration by being too complicated or difficult.

Effective communication involves adapting to any special needs resulting from sensory, motor, or cognitive impairments that are present.

◆Evaluation

To determine whether the plan of care has been successful, both nurse and the patient evaluate the patient's communication outcomes. You need to evaluate nursing interventions to determine what strategies or interventions were effective and what changes in the patient's situation resulted because of the interventions. For example, if using pen and paper proves frustrating for a nonverbal patient whose handwriting is shaky, you need to revise the care plan to include use of a picture board instead. If expected outcomes are not met or progress is not satisfactory, you need to determine what factors influenced the outcomes and then modify the plan.

You can evaluate the effectiveness of your own communication by videotaping practice sessions with peers, making recordings, and analyzing written records of your verbal and nonverbal interactions with patients. Process recording analysis reveals faults in personal communication techniques, so that you can improve their effectiveness. Box 17-10 contains a sample communication analysis of such a record. Analyzing a process recording enables you to evaluate the following:

- Determine whether the nurse encouraged openness and allowed the patient to "tell his or her story," expressing both thoughts and feelings.
- Identify any missed verbal or nonverbal cues or conversational themes.

► BOX 17-9 Communicating With Patients Who Have Special Needs

Patients Who Cannot Speak Clearly (Aphasia, Dysarthria, Muteness)

- Listen attentively, be patient, and do not interrupt.
- Ask simple questions that require yes or no answers.
- Allow time for understanding and response.
- Use visual cues (e.g., words, pictures, and objects) when possible.
- Allow only one person to speak at a time.
- Do not shout or speak too loudly.
- Encourage the patient to converse.
- If you have not understood the patient, let him or her know.
- Collaborate with a speech therapist as needed.
- Use communication aids:
 - Pad and felt-tipped pen or Magic Slate
 - Communication board with commonly used words, letters, or pictures denoting basic needs
 - Call bells or alarms
 - Sign language
 - Use of eye blinks or movement of fingers for simple responses ("yes" or "no")

Patients Who Are Cognitively Impaired

- Reduce environmental distractions while conversing.
- Capture patient's attention before you speak.
- Use simple sentences, and avoid long explanations.
- Ask one question at a time.
- Allow time for the patient to respond.
- Be an attentive listener.
- Include family and friends in conversations, especially in topics known to the patient.

Patients Who Are Hearing Impaired

- Check for the presence of hearing aids and glasses.
- Reduce environmental noise.
- Get the patient's attention before you speak.
- Face the patient so that your mouth is visible.
- Do not chew gum.
- Speak at normal volume; do not shout.

- Rephrase rather than repeat, if your message is misunderstood.
- Provide a sign language interpreter if this is indicated.

Patients Who Are Visually Impaired

- Check for use of glasses or contact lenses.
- Identify yourself when you enter room, and notify patient when you leave room.
- Speak in a normal tone of voice.
- Do not rely on gestures or nonverbal communication to convey messages.
- Use indirect lighting, avoiding glare.
- Use an appropriate font size for the impairment (i.e., at least 14-point print).

Patients Who Are Unresponsive

- Call the patient by name during interactions.
- Communicate both verbally and by touch.
- Speak to the patient as though he or she can hear.
- Explain all procedures and expected sensations.
- Provide orientation to person, place, and time.
- Avoid talking about patient to other people in his or her presence.
- Avoid saying things that the patient should not hear (e.g., gossip or speculations about patient's condition).
- Always assume that patients can hear and understand everything said at their bedside.

Patients Who Do Not Speak English

- Speak to the patient in a normal tone of voice (shouting may be interpreted as anger).
- Establish a method for the patient to signal a desire to communicate (call light or bell).
- Provide an interpreter (translator) as needed.
- Develop communication board, pictures, or cards.
- Translate words from the English list into the patient's native language for the patient to make basic requests.
- Ensure that a dictionary (English-French, English-Blackfoot, and so forth) is available if patient can read.

- Examine whether nursing responses blocked or facilitated the patient's efforts to communicate.
- Determine whether nursing responses were positive and supportive or superficial and judgmental.
- Examine the type and number of questions that were asked.
- Determine the type and number of therapeutic communication techniques used.
- Discover any missed opportunities to use humour, silence, or touch.
- Evaluation of the communication process helps you gain confidence and competence in interpersonal skills. Becoming an effective communicator greatly increases your professional satisfaction and success. No skill is more basic, and no tool more powerful, than communication.

✦ KEY CONCEPTS

- Communication is a powerful therapeutic tool and an essential nursing skill used to influence other people and achieve positive health care outcomes.
- Relational practice depends upon approaches to communication that enhance the nurse's capacity to be in relation to patients in often very uncertain and difficult circumstances.

- Communication involves the entire human being: body, mind, emotions, and spirit.
- Critical thinking facilitates communication through creative inquiry, focused self-awareness, reflexivity, empathy, and awareness of other people, as well as the intentionality of purposeful analysis, and control of perceptual biases.
- Nurses consider many contexts and factors influencing communication when making decisions about what, when, where, how, why, and with whom to communicate.
- Nurses use intrapersonal, interpersonal, transpersonal, small-group, and public interaction to achieve positive change and health goals.
- Communication is most effective when the receiver and sender accurately perceive the meaning of each other's messages.
- Message transmission is influenced by the sender's and receiver's physical and developmental status, perceptions, values, emotions, knowledge, sociocultural background, roles, and environment.
- Effective verbal communication requires appropriate vocabulary, intonation, clear and concise phrasing, proper pacing of statements, and proper timing and relevance of a message.

► BOX 17-10 Sample Communication Analysis

NURSE: Good morning, Mr. Simpson. [Smiles and approaches bed, holding clipboard]

- Acknowledging by name, social greeting to begin conversation

PATIENT: What's good about it? [Arms crossed over chest, frowning, with a direct stare]

- Nonverbal signs of anger

NURSE: You sound unhappy. [Pulls up chair and sits at bedside]

- Sharing observation, nonverbal communication of availability

PATIENT: You'd be unhappy, too, if nobody would answer your questions. [Angry tone of voice, challenging expression]

- Further expression of feelings, facilitated by nurse's accurate observation

NURSE: This hospital has a fine staff, Mr. Simpson. I'm sure no one would intentionally keep information from you.

- Feeling threatened and being defensive: a nontherapeutic technique

PATIENT: All right, then: Why wouldn't that girl tell me what my blood sugar was?

NURSE: I'm not sure. If I were you, I'd forget about it and get a fresh start.

- Giving advice and using cliché, which is nontherapeutic; would have been better to acknowledge that patient had a right to know the information

NURSE: I'm going to test your blood sugar levels in a minute, and I'll tell you the results. [Performs test] Your blood sugar level was 20.

- Providing information, demonstrating trustworthiness

PATIENT: That's up pretty high, isn't it? [Worried facial expression]

- Feeling very concerned about test results

NURSE: [Nods; long pause]

- Nonverbal affirmation, use of silence to allow patient time to absorb information and gather thoughts

PATIENT: I'm so afraid complications will set in because my blood sugar is high. [Stares out window]

- Feeling free to express deeper concerns, which are hard to face

NURSE: What kinds of things are you worried about?

- Open-ended question to elicit information

PATIENT: I could lose a leg, as my mother did. Or go blind. Or have to live hooked up to a kidney machine for the rest of my life.

NURSE: You've been thinking about all kinds of things that could go wrong, and it adds to your worry not to be told what your blood sugar is.

- Summarizing to let patient "hear" what he has communicated

PATIENT: I always think the worst. [Shakes head in exasperation]

- Expressing insight into his "inner dialogue"

NURSE: I'll pass along to the technician that it's okay to tell you your blood sugar levels. And later this afternoon, I'd like us to talk more about some things you can do to help avoid these complications and set some goals for controlling your blood sugar. [Stands up, keeps looking at patient]

- Providing information, encouraging collaboration and goal setting; giving nonverbal cue that conversation is nearing end

PATIENT: Okay, I'll see you later.

- Nonverbal communication often conveys the true meaning of a message more accurately than verbal communication.
 - Helping relationships are strengthened when the nurse demonstrates caring by establishing trust, empathy, autonomy, confidentiality, and professional competence.
 - Effective communication skills are facilitative and tend to encourage the other person to openly express ideas, feelings, or concerns.
 - Ineffective communication techniques are inhibitive and tend to block the other person's willingness to openly express ideas, feelings, or concerns.
 - The nurse must blend social and informational interactions with therapeutic communication skills so that other people can explore feelings and manage health issues.
 - Older adult patients with sensory, motor, or cognitive impairments require the adaptation of communication techniques to compensate for their loss of function and special needs.
 - Patients with impaired verbal communication require special consideration and alterations in communication techniques to facilitate the sending, receiving, and interpreting of messages.
 - Desired outcomes for patients with impaired verbal communication include increased satisfaction with interpersonal interactions, the ability to send and receive clear messages, and attending to and accurately interpreting verbal and nonverbal cues.
- Jan, a nurse colleague of Mary Ellen, is having difficulty interacting assertively with Dr. Fielding, a physician who has an abrupt, intimidating communication style. Jan frequently complains of tension headaches, pent-up anger, and crying easily. What can Mary Ellen do to help Jan?
 - Mr. Hess, a patient with Parkinson's disease living at a long-term care facility, has a stiff, expressionless face as a result of his disease. He sits slumped in a recliner chair all day and seems lost in his own world, rarely looking at or interacting with anyone. When he does talk, he mumbles in a soft voice, and his words are difficult to understand. What communication skills would support your relational practice with Mr. Hess?
 - Ms. Velma Eberhard, a member of a Hutterite colony in western Canada, is considering whether she should have her two young children immunized before they begin attending school. What communication skills could you use to help her decide, and what traps must you avoid in communication about information and decision making?
 - Ms. Esther Simons, a patient who is receiving palliative care, confides in you that she feels overwhelmed with the number of issues she must attend to, now that she's facing the possibility of death. She says, "My thoughts are all over the place. I don't know where to start." What communication skills, based on the critical thinking model, can you use to help her at this point?

❖ CRITICAL THINKING EXERCISES

- Ms. Mary Goodrunning, an Aboriginal Canadian of Chipewyan descent, must learn how to manage her diabetes mellitus and self-administer insulin injections. Considering the elements of critical thinking for communication, what communication approaches and skills could you use to help her?

❖ REVIEW QUESTIONS

- Communication is not about the message that was intended but rather the message that was received and experienced in relation to each other. The statement that best helps explain this is as follows:

1. Clear communication can ensure the patient will receive the message intended.
 2. Authenticity in communication is the responsibility of the sender and the receiver.
 3. Attention to personal space (physically and emotionally) can minimize misinterpretation of communication.
 4. Contextual factors, such as attitudes, values, beliefs, and self-concept, influence relational capacity and communication.
2. As a nurse, you would demonstrate active listening by
 1. Agreeing with the patient
 2. Repeating everything the patient says to clarify
 3. Assuming a relaxed posture, establishing eye contact, and leaning toward the patient
 4. Smiling and nodding continuously throughout the interview
 3. During the orientation phase of the helping relationship, you might
 1. Discuss the cards and flowers in the room
 2. Work together with the patient to establish goals
 3. Review the patient's history to identify possible health concerns
 4. Use therapeutic communication to manage the patient's confusion
 4. If you are working with a patient who has expressive aphasia, it would be most helpful for you to
 1. Ask open-ended questions
 2. Speak loudly and use simple sentences
 3. Allow extra time for the patient to respond
 4. Encourage a family member to answer for the patient
 5. The statement that best explains the collaboration with other members of the health care team for the patient's plan of care is that the nurse
 1. Collaborates with colleagues and the patient's family to provide combined expertise in planning care
 2. Consults the physician for direction in establishing goals for patients
 3. Depends on the latest literature to complete an excellent plan of care for patients
 4. Works independently to plan and deliver care and does not depend on other staff for assistance
 6. "I'm not sure I understand what you mean by 'sicker than usual.' What is different now?" This statement reflects the therapeutic technique of
 1. Paraphrasing
 2. Providing information
 3. Clarifying
 4. Focusing
 7. "We've talked a lot about your medications, but let's look more closely at the trouble you're having in taking them on time." In this situation, you would be using the therapeutic communication skill of
 1. Paraphrasing
 2. Providing information
 3. Clarifying
 4. Focusing
 8. As a nursing student, you give yourself positive messages regarding your ability to do well on a test. This type of communication is
 1. Public
 2. Intrapersonal
 3. Interpersonal
 4. Transpersonal
 9. When working with an older adult, you should remember to avoid
 1. Touching the patient
 2. Shifting from subject to subject
 3. Allowing the patient to reminisce
 4. Asking the patient how he or she feels
 10. You should consider zones of personal space and touch when caring for patients. While there are distinctions based on unique circumstances, as a general professional practice, if you are taking the patient's health history, you should be
 1. 0 to 45 cm from the patient
 2. 45 cm to 1 m from the patient
 3. 1 to 4 m from the patient
 4. 4 m or farther from the patient

✦ RECOMMENDED WEB SITES

American Sign Language Browser: <http://www.commtelab.msu.edu/sites/aslweb/browser.htm>

This Web site provides an English and manual alphabet and dictionary, a brief history of sign language, and links to other relevant Web sites.

The Canadian Hearing Society: <http://www.chs.ca/en/sign-language-services/welcome-to-sign-language-services.html>

This Web site provides services for learning sign language.

Communicative Disorders Assistant Association of Canada: <http://www.cdaac.ca/links.htm>

This Web site provides links to various Canadian and international resources for people with conditions that affect communication.

Establishing Therapeutic Relationships. Registered Nurses' Association of Ontario: Best Practice Guidelines

- **e-Learning Program:** <http://rnao.ca/bpg/guidelines/resources/elearning-program-establishing-therapeutic-relationships>
- **Video:** http://old.rnao.org/TR_Video/index.html

Jest for the Health of It! <http://www.jesthealth.com>

This Web site provides links to articles and resources about using therapeutic humour in nursing practice.

Medscape: <http://www.medscape.com/px/urlinfo>

Medscape is a resource for physicians and nurses that requires a one-time registration (free of charge) and offers links to current literature on numerous health care topics. Enter "Communication" in the search frame, and the site will list current articles on communication in health care.

Review Question Answers

1. 4; 2. 3; 3. 1; 4. 3; 5. 1; 6. 3; 7. 4; 8. 2; 9. 2; 10. 2

Rationales for the Review Questions appear at the end of the book.

Caring in Nursing Practice

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objectives

Mastery of content in this chapter will enable you to:

- Define key terms listed.
- Discuss the role that caring plays in building a nurse–patient relationship.
- Compare and contrast theories on the concept of caring.
- Discuss potential implications when nurses' perceptions of caring differ from the patients' perceptions of caring.
- Explain how an ethic of care influences nurses' decision making.
- Describe ways to express caring through presence and touch.
- Describe the therapeutic benefit of listening to patients.
- Explain the relationship between knowing a patient and clinical decision making.

key terms

Caring, p. 262
Comfort, p. 268
Cultural aspects of care,
p. 264

Ethic of care, p. 268
Presence, p. 268
Transcultural, p. 264
Transformative, p. 264

media resources

evolve WEBSITE

<http://evolve.elsevier.com/Canada/Potter/fundamentals/>

- Audio Chapter Summaries
- Examination Review Questions
- Glossary
- Student Learning Activities
- Weblinks

Caring is a central concept that is essential to the practice of nursing. It is of even greater importance because of today's increasingly hectic health care environment. The demands, pressure, and time constraints in the health care environment leave little room for caring practice; as a result, nurses and other health care providers may become cold and indifferent to patients' needs (Watson 2006a, 2009). Cara (2003) believed that the current health care climate, with its emphasis on restructuring, threatens to dehumanize patient care. She stressed that the nursing profession must ensure that caring continues to be a strong force within all areas of nursing: in the clinical, administrative, educational, and research fields. The increasing use of technological advances for rapid diagnosis and treatment often causes nurses and other health care providers to perceive their relationship with patients as relatively unimportant.

Technological advances become dangerous without a context of skillful and compassionate care.

Caring practices have been evolving and are an integral part of nursing in Canada. This evolution is a complex one, and there are many influences on the development of caring. Nursing education curricula that support caring practices are essential in order for the evolution to continue. There is a direct relationship between caring and power. Traditionally, nursing has been dominated by the medical model, which was predominantly male, and caring was considered to be innate women's work (Falk, 1996). Nursing curricula were set by medical staff and hospital administrators, and the concept of caring did not require knowledge or power; thus, it was not included in any course of study. In the 1970s, hospital nursing schools were moved to colleges, and nursing was able to develop its own nursing curricula with its own power based on knowledge and expertise (Anthony & Landeen, 2009). The humanistic educative paradigm was developed and the Bevis and Watson (1989) Caring Curriculum came about. This curriculum is an empowerment model that values caring practices. The Caring Curriculum has continued to evolve and to further caring practices through nursing scholarship (Lewis et al., 2006).

Caring practices and expert knowledge that are at the heart of competent nursing practice must be valued and embraced (Benner & Wrubel, 1989; Lesniak, 2005). When you engage patients in a caring and compassionate manner, you learn that therapeutic gains in the health and well-being of your patients are enormous.

Think about your own experiences of being ill or having a problem that necessitated health care intervention. Consider the following two scenarios, and select the situation that you believe most successfully demonstrates a sense of caring.

A nurse enters a patient's room, greets the patient warmly while touching the patient lightly on the shoulder, makes eye contact, sits down for a few minutes, and asks about the patient's thoughts and concerns. The nurse listens to the patient's story, looks at the intravenous solution being administered, briefly examines the patient, and then checks the vital sign summary on the bedside computer screen before departing the room.

A second nurse enters the patient's room, looks at the intravenous solution being administered, checks the vital sign summary sheet on the bedside computer screen, and acknowledges the patient but never sits down or touches the patient. The nurse makes eye contact from above while the patient is in the vulnerable horizontal position. The nurse asks a few brief questions about the patient's symptoms and then leaves.

The first scenario depicts the nurse in specific acts of caring. The nurse's calm presence, parallel eye contact, attention to the patient's concerns, and physical closeness all express a patient-centred, comforting approach. In contrast, the second scenario is task-oriented and expresses a sense of indifference to the patient's concerns. During times of illness or when a person seeks the professional guidance of a nurse, caring is essential in helping the individual reach positive outcomes.

Theoretical Views on Caring

Caring is a universal phenomenon influencing the ways in which people think, feel, and behave in relation to one another. Since Florence Nightingale, nurses have studied caring from a variety of philosophical and ethical perspectives. A number of nursing scholars developed theories about caring because of

its importance to the practice of nursing. This chapter does not detail all theoretical positions on caring, but it helps you understand why caring is at the heart of your ability to work with all patients in a respectful and therapeutic way.

Caring Is Primary

Benner (1984) and Benner and Wrubel (1989) offered nurses a rich, holistic understanding of nursing practice and caring through interpretation of expert nurses' stories. After listening to nurses' stories and analyzing their meaning, Benner described caring as the essence of professional nursing practice. The stories revealed nurses' behaviour and decisions that expressed caring. **Caring** means concern about a person, events, projects, and things (Benner & Wrubel, 1989). It is a word for being connected.

Caring reflects what matters to a person; it describes a wide range of involvements, from parental love to friendship, from caring for one's work to caring for one's pet, to caring for and about one's patients. Benner and Wrubel (1989, p. 1) noted, "Caring creates possibility." Personal concern for another person, an event, or a thing provides motivation and direction for people to care. Caring as a framework has practical implications for transforming nursing practice (Boykin et al., 2003). The ethic of caring must be learned experientially by the nurse and leads to a skilled knowledge on how to relate to others' concerns with a respectful, responsive, and supportive approach (Benner et al., 2009). Caring is an inherent feature of nursing practice whereby nurses help patients recover from illness, give meaning to that illness, and maintain or re-establish connection with other people. Caring helps nurses identify successful interventions, and this concern then guides future caregiving.

Each individual patient has a unique background of experiences, values, and cultural perspectives. As you acquire more experience, caring helps you focus on the patients for whom you are caring. Caring facilitates your ability to understand a patient, enabling you to recognize a patient's problems and to find and implement individualized solutions.

In addition to their work in understanding caring, Benner and Wrubel (1989) described the relationship between health, illness, and disease. Health is not the absence of illness, nor is illness identical to disease (see Chapter 1 for further information). Health is a state of being that people define in relation to their own values, personality, and lifestyle. Health exists along a continuum. Illness is the experience of loss or dysfunction, whereas disease is manifested as abnormality at the cellular, tissue, or organ level. Some patients have a disease (e.g., arthritis or diabetes) but do not experience the sense of being ill or a decrease in function. Some individuals do not seek health care until they experience a disruption, loss, or concern. For example, a patient who has had diabetes for a number of years may not sense being ill until the disease causes serious visual impairment, which threatens the ability to work. Illness therefore has meaning only within the context of the person's life.

Because illness is the human experience of loss or dysfunction, any treatment or intervention given without consideration of its meaning to an individual is likely to be worthless. Expert nurses understand differences between health, illness, and disease. Through caring relationships, you learn to listen to patients' stories about their illness so that you obtain an understanding of the meaning of illness to them. With this understanding, you provide therapeutic, patient-centred care.

The Essence of Nursing and Health

From a **transcultural** perspective, Leininger (1978) described the concept of care as the essence and the central, unifying, and dominant domain that distinguishes nursing from other health disciplines. Care is an essential human need, necessary to the health and survival of all individuals. Care, unlike cure, assists an individual or group in improving a human condition. Acts of caring are nurturant and skillful activities, processes, and decisions to assist people in ways that are empathetic, compassionate, and supportive. An act of caring is dependent on needs, problems, and values of patients. Leininger's studies of numerous world cultures have revealed that care helps protect, develop, and nurture people and enable them to survive. Care is vital to recovery from illness and to maintenance of healthy life practices in all cultures.

Leininger (1988) stressed the importance of understanding cultural caring behaviours and other **cultural aspects of care**. Even though caring is a universal phenomenon, expressions, processes, and patterns of caring vary among cultures (Box 18-1). Caring is very personal, and expressions of caring differ for each patient. For caring to be effective and meaningful to patients, you need to learn culturally specific behaviours and words that reflect human caring in different cultures. Refer to Chapter 9 for more information on culture and ethnicity.

Transpersonal Caring

Patients and their families should receive high-quality human interaction with nurses. Unfortunately, many conversations

occurring between patients and their nurses are brief and disconnected. According to Watson's (1979, 1988, 2008) theory of caring (a holistic nursing model), a conscious intention to care promotes healing and wholeness (Hoover, 2002). This intention is complementary to conventional science and modern nursing practices. Theory integrates human caring processes with healing environments, incorporating life-generating and life-receiving processes of human caring and healing for both nurses and their patients (Watson, 2006b). The theory describes a consciousness that allows nurses to raise new questions about what it means to be a nurse, what it means for a patient to be ill, and how caring and healing should take place. Transpersonal caring theory rejects the disease orientation of health care and stresses care as more important than cure (Watson, 1988). Instead of focusing on the patient's disease and its treatment by conventional means, transpersonal caring explores inner sources of healing to protect, enhance, and preserve a person's dignity, humanity, wholeness, and inner harmony.

In Watson's (2006b) view, caring is almost spiritual. Caring preserves human dignity in the technological, cure-dominated health care system. The emphasis is on the nurse-patient relationship, as well as the caring relationship. During a single caring moment between the nurse and patient, the nurse and patient may communicate to each other on a level deeper than simple verbal exchange. There may be a sense of connection between the one cared for and the one caring. Caring on a deep, interpersonal level can promote healing (Watson, 2006b). The application of Watson's caring model may enhance your caring practices. The model is **transformative** because the relationship influences both nurses and patients, for better or for worse (Hoover, 2002). Watson further developed her caring science theory, and her carative factors are now called *carative processes* and are outlined in Table 18-1. Evidence-informed material that enhances caring is described in Box 18-2.

Swanson's Theory of Caring

In an effort to develop a theory of caring applicable for nursing practice, Swanson (1991) studied patients and professional caregivers. Three different groups were interviewed: women who miscarried, parents and health care providers in a neonatal intensive care unit, and socially at-risk mothers who had received long-term, public health intervention. All groups were interviewed before, during, or after labour and delivery of a child and had experienced the phenomenon of caring. Researchers asked each subject questions regarding how they experienced caring in their situation. After analyzing the stories and descriptions of three research groups, Swanson developed a theory of caring, whereby caring consists of five categories or processes: knowing, "being with," "doing for," enabling, and maintaining belief (Table 18-2).

Swanson's (1991) contributions are valuable in providing direction for how to develop useful and effective caring strategies. Each process is crucial in making positive differences in patients' health and well-being outcomes. Research findings used to develop the theory are useful in guiding clinical nursing practice. For example, Swanson (1999) tested the effects of caring-based counselling on women's emotional well-being in the first year after the miscarriage. Caring-based counselling was significant in reducing women's depression and anger, particularly during the first four months after the miscarriage.

BOX 18-1 CULTURAL ASPECTS OF CARE

Nurse Caring Behaviours

As a nurse, you must provide caring behaviours that are based on patients' cultural values and beliefs. Although the need for human caring is universal, its application is based on cultural norms. For example, providing time for family presence is often more valuable to traditional Asian families than is nursing presence. Using touch to convey caring sometimes crosses cultural norms. Sometimes gender-congruent caregivers or patients' family need to provide caring touch. In some cultures, maintaining eye contact while listening to the patient is considered disrespectful.



Implications for Practice

- Know patient's cultural norms for caring practices.
- Know patient's cultural practices regarding end-of-life care. In some cultures, it is considered insensitive to tell patients that they are dying.
- Determine whether a member of patient's family or cultural group is most appropriate resource for presence or touching.
- Determine the need for gender-congruent caregivers.
- Avoid use of idioms because they can often create misunderstanding between the caregiver and the patient or family.
- Know patient's cultural practices regarding removal of life support.

Data from Galanti, G. A. (2004). *Caring for patients from different cultures* (3rd ed.). Philadelphia, PA: University of Pennsylvania Press; and Watson, J. (2006). Caring theory as an ethical guide to administrative and clinical practices. *Nursing Administration Quarterly*, 30(1), 48–55.

▶ TABLE 18-1 Watson's Carative Processes

Carative Factors or Caritas Processes**Description**

Humanistic–altruistic values	Practising loving-kindness and equanimity for self and others
Instilling or enabling faith and help	Being authentically present: enabling, sustaining, and honouring deep belief system and subjective world of self and others
Cultivating sensitivity to oneself and others	Cultivating one's own spiritual practices; deepening self-awareness, going beyond "ego-self"
Developing a helping–trusting, human caring relationship	Promoting and supporting a relationship that is characterized by trust, authenticity, helping, and caring
Promoting and accepting expression of positive and negative feelings	Being present to and supportive of expression of positive and negative feelings, recognizing both as important to a deep, interpersonal connection between self and person being cared for
Systematic use of scientific (creative) problem-solving process	Creatively using self and all ways of knowing, being, and doing as part of caring process (engaging in artistry of caring–healing practices)
Providing for a supportive, protective, or corrective mental, social, spiritual environment	Creating healing environment at all levels: physical and nonphysical, whereby wholeness, beauty, comfort, dignity, and peace are potential (being or becoming the environment)
Assisting with gratification of human needs	Reverentially and respectfully assisting with basic needs; holding an intentional, caring consciousness of touching and working with the embodied spirit of another; honouring a sense of unity within oneself; allowing for spirit-filled connection
Allowing for existential–phenomenological dimensions	Being open-minded and attending to spiritual, mysterious, unknown existential dimension of life, death, and suffering: "allowing for a miracle"

Adapted from Watson, J. (2008). *Nursing: The philosophy and science of caring* (rev. ed., p. 31). Boulder, CO: University Press of Colorado. Reprinted by permission of University Press of Colorado.

The Human Act of Caring

Roach (1997) also focused on the integration of caring and spirituality in her "human act of caring" theory. She was requested by the Canadian Nurses Association (CNA) in 1977 to develop the first Canadian code of ethics for Canadian nurses. This first code was based on her caring theory, which

* BOX 18-2

EVIDENCE-INFORMED PRACTICE GUIDELINE**Enhancing Caring****Evidence Summary**

Caring facilitates healing and improves patient satisfaction with nursing care. However, does the instructional process influence human caring? Do nurse educators present instructional methods that improve students' caring practices? In Hoover's (2002) study, undergraduate nursing students attended a 15-week educational module on nursing as human caring. The purpose of the module was to improve students' understanding of caring practice and to thus make them more caring practitioners. Researchers interviewed students before and after completing the module to understand the effects of this module on their caring practices. They asked students about factors that facilitate and impede their caring practices. Students reported an increase in self-awareness in regard to (1) connecting in relationships with self and others, (2) finding purpose and meaning in life, and (3) clarifying values. Several students spoke of becoming more tolerant of others, recognizing each person's uniqueness, and appreciating a person's perspectives. By recognizing themselves as caring persons, students gained meaning in their lives. Many were able to report a great deal of satisfaction in recognizing that they were caring persons and how nursing allowed them to express that characteristic. Students worked through the emotional issues and practical constraints, which allowed them to grow spiritually and connect with patients at a deeper level. Finally, students also expressed an enhanced appreciation of what they valued.

**Application to Nursing Practice**

- Increasing knowledge and understanding of caring helps nurses begin to understand patients' worlds and to change their approach to nursing care.
- Use of caring in nursing practice encourages a more holistic approach to nursing care.
- As nurses use caring, they get to know their patients and therefore better meet their needs.
- The caring model involves closeness, commitment, and involvement in the nurse–patient relationship.

Source: Hoover, J. (2002). The personal and professional impact of undertaking an educational module on human caring. *Journal of Advanced Nursing*, 37(1), 79–86.

comprised five concepts: compassion, competence, confidence, conscience, and commitment (Table 18-3). This foundational work set the stage for a value-based code that has been updated over time but continues to retain Roach's caring principles as the framework (Storch, 2007). The CNA (1997) *Code of Ethics for Registered Nurses* was revised and published in 2008.

Pusari (1998) applied Roach's theory in work with people with life-threatening illnesses. She proposed that Roach's caring elements be extended to include the concepts of courage, culture, and communication; thus, the theory would be more holistic. These eight concepts incorporate physical, psychological, emotional, spiritual, and cultural components to guide nurses as they provide comprehensive and individualistic care.

► TABLE 18-2 Swanson's Theory of Caring

Caring Process	Definitions	Subdimensions
Knowing	Striving to understand an event as it has meaning in the life of the other person	Avoiding assumptions about the life of the other person Centring on the one cared for Seeking cues
"Being with"	Being emotionally present for the other person	Engaging the self or both the self and the other person "Being there" Conveying ability Sharing feelings
"Doing for"	Doing for (assisting) the other person with actions that he or she would do for himself or herself if it were at all possible	Not burdening Comforting Anticipating Performing skillfully Protecting
Enabling	Facilitating the other person's passage through life transitions (e.g., birth, death) and unfamiliar events	Preserving dignity Informing and explaining Supporting and allowing Focusing Generating alternatives
Maintaining belief	Sustaining faith in the other person's capacity to get through an event or transition and face a future with meaning	Validating and giving feedback Believing in and holding in esteem Maintaining a hope-filled attitude Offering realistic optimism Spending extra effort to help the other person

From Swanson, K. M. (1991). Empirical development of a middle-range theory of caring. *Nursing Research*, 40(3), 161–166.

► TABLE 18-3 The Human Act of Caring

Compassion	- Way of living born out of an awareness of one's relationship to all living creatures - Engendering a response of participation in the experience of another - A sensitivity to the pain and brokenness of the other; a quality of presence that allows one to share with and make room for the other
Competence	State of having the knowledge, judgement, skills, energy, experience, and motivation required to respond adequately to the demands of one's professional responsibilities
Confidence	- Quality that fosters trusting relationships - Goals of service rendered within an environment and under conditions of mutual trust and respect
Conscience	- State of moral awareness - Compass directing one's behaviour according to the moral fitness of things
Commitment	Complex affective response characterized by a convergence between one's desires and one's obligations and by a deliberate choice to act in accordance with them

From Roach, S. (1992). *The human act of caring. A blueprint for the health professions*. Ottawa: Canadian Hospital Association.

Summary of Theoretical Views

Nursing caring theories have common themes. Caring is highly relational. Caring relationships open up possibilities (e.g., for comfort, touch, and solace) or close them down (Benner, 2004). Nurses and patients enter into a relationship that is much more than one person simply "doing tasks for" another. A mutual give-and-take develops as nurse and patient begin to know and care for one another. In his own experience with cancer, sociologist Arthur Frank (1998) noted that what he wanted when he was ill was a mutual relationship with persons who were also clinicians and patients. It was important for Frank to be seen as one of two fellow human beings, not the dependent patient being cared for by the expert technical clinician.

Caring seems highly invisible at times when a nurse and patient enter a relationship of respect, concern, and support. The nurse's empathy and compassion become a natural part of every patient encounter. Absence of caring, however, is very obvious. For example, if nurses show a lack of interest or choose to avoid a patient's request for help, the nurses' inactions quickly convey an uncaring attitude. Benner and Wrubel (1989, p. 14) related the story of a clinical nurse specialist who learned from a patient what caring is all about: "I felt that I was teaching him a lot, but actually he taught me. One day he said to me (probably after I had delivered some well meaning technical information about his disease), 'You are doing an OK job, but I can tell that every time you walk in that door you are walking out.'" In this nurse's story, the patient perceived that the nurse was simply going through the motion of teaching and showed little caring toward the patient. Patients quickly sense nurses' failure to empathize with them.

The Moral and Ethical Bases of Responsive Nurse-Patient Relationships

Tarlier (2004), a Canadian author, presented another perspective on the principle of caring as a foundational nursing concept: that the concept of caring has not been well defined and that the nursing ethic of caring must be empirically shown to make a difference in patient outcomes. For the nursing profession, it is important to provide evidence that caring is tied to a broader ethical knowledge base.

A personal moral sense that is shared by other people needs to be agreed on as a principle and integrated specifically into the discipline of nursing and the nursing ethical knowledge base. Tarlier (2004) put forward the idea of responsive nurse-patient relationships that are conceptualized in the nursing literature. Responsive relationships are based on respect, trust, and mutuality. These relationships can tie together theory, ethical knowledge, and clinical outcomes and strengthen the nursing ethical knowledge base.

With a caring nurse, the patient senses commitment on the part of the nurse and is willing to allow the nurse to gain an understanding of the patient's experience of illness. In a study of oncology patients' descriptions of their nursing care, Radwin et al. (2005, p. 166) found that patients characterized a caring nurse as one who would "quietly try to care for every need I had" and "be there when you need them" versus "treat[ing] you like a number or a case rather than a person." You become a coach and partner rather than a detached provider of care.

Imagine a nurse is working with a patient who recently was diagnosed with diabetes mellitus and who must learn to administer daily insulin. In this scenario, the nurse's caring behaviour might be enabling. When a nurse practises enabling, the patient and nurse work together to identify treatment alternatives and resources. The nurse enables the patient to understand diabetes management, and the nurse supports the patient in progressing through self-care activities.

Another common theme in caring is to understand the context of the patient's life and illness. It is difficult to demonstrate caring without gaining an understanding of who the other person is and that person's perception of his or her illness. By exploring the following questions with the patient, you can begin understanding the patient's perception of illness: "How was your illness first recognized?" "How do you feel about the illness?" "How does the illness affect your daily life practices?" Knowing the context of a patient's illness helps you choose and individualize interventions that will actually help the patient. This approach is more successful than simply selecting interventions on the basis of the patient's symptoms or disease process.

Patients' Perceptions of Caring

Swanson's (1991) theory of caring is a foundation for understanding behaviours and processes that characterize caring. Other researchers have also studied caring from patients' perceptions (Table 18-4). Identifying nurse behaviours that patients perceive as caring helps nurses understand what patients expect of them as caregivers. Patients continue to value nurses' effectiveness in performing tasks and clearly also value the affective dimension of nursing care (Williams, 1997): establishing a reassuring presence, recognizing an individual as unique, and being attentive to patients. Each patient has a

unique background of experiences, values, and cultural perspectives; however, understanding common behaviours that patients associate with caring helps you learn to express caring in practice.

The study of patients' perceptions is important because health care emphasizes patient satisfaction. What patients experience in their interactions with institutional services and health care providers, and what they think of that experience, determines how patients use the health care system and how they can benefit from it (Gerteis et al., 1993; Mayer, 1986). When patients believe that health care providers are sensitive, sympathetic, compassionate, and interested in them as people, they usually become active partners in the plan of care (Attree, 2001). Williams (1997) studied relationships between patients' perceptions of four dimensions of caring and their satisfaction with nursing care. Patients indicated that they were more satisfied when they perceived nurses to be caring. Radwin (2000) found that oncology patients associated excellent nursing care with attentiveness, partnership, individualization, rapport, and caring. As institutions look to improve patient satisfaction, creating a caring environment is a necessary and worthwhile goal. Patients' satisfaction with nursing care is an important factor in their decision to return to a hospital.

As a new clinical practitioner, you must account for how patients perceive caring and the best approaches to providing care. To start, consider behaviours associated with caring and consider an individual patient's perceptions and unique expectations. Patients and nurses frequently differ in their perceptions of caring (Mayer, 1987; Wolf et al., 2003). Consider the situation in which your patient is fearful of having an intravenous catheter inserted, and you are still a novice at catheter insertion. Instead of giving a lengthy description of the procedure to relieve the patient's anxiety, you decide the patient will benefit more if you obtain assistance from a skilled staff member. Understanding patients' perceptions helps you select caring approaches that are most appropriate to the patients' needs.

Ethic of Care

Caring is a moral imperative. Through caring for others, human dignity is ultimately protected, enhanced, and preserved. Watson (1988) suggested that caring, as a moral ideal,

► TABLE 18-4 Comparison of Research Studies Exploring Patients' Perceptions of Nurse Caring Behaviour

WOLF ET AL. (2003)		ATTREE (2001)	CHANG ET AL. (2005)
Patients With Cardiac Conditions	Male Patients	General Medical Patients and Families	Patients With Cancer
Managing equipment skillfully	Being physically present so that patient feels valued	Checking up on patient	Being accessible to patient and family
Being perceptive and compassionate	Returning voluntarily without being called	Being compassionate and patient	Providing comfort
Being physically present	Making patient feel comfortable, relaxed, and secure	Demonstrating sensitivity and sympathy	Being trustworthy
Using a soft, gentle voice	Attending to comfort and needs of patient before performing tasks	Using a calm, gentle, and kind approach	Anticipating patient and family needs
Returning to patient voluntarily without being asked	Using a kind, soft, pleasant, gentle voice and attitude		
Providing comfort and security			
Helping reduce pain			

provides the stance from which a nurse intervenes and ensures the practice of ethical standards for good conduct, character, and motives. Chapter 7 explores the importance of ethics in professional nursing. The term *ethic* refers to the ideals of right and wrong behaviour. In any patient encounter, a nurse needs to know what behaviour is ethically appropriate. An **ethic of care** ensures that nurses do not make decisions solely on the basis of intellectual or analytical principles and places caring at the centre of decision making. For example, consider whether placing a disabled relative in a long-term care facility is truly caring.

An ethic of care is concerned with relationships between people and with a nurse's character and attitude toward others. Nurses who function according to an ethic of care are sensitive to unequal relationships that can lead to an abuse of one person's power over another, intentional or otherwise. In health care settings, patients and families are often on unequal footing with professionals because of patients' illness, lack of information, regression caused by pain and suffering, and unfamiliar circumstances. According to an ethic of care, the nurse is the patient's advocate, solving ethical dilemmas by attending to relationships and by recognizing each patient's uniqueness as a human being.

Caring in Nursing Practice

It is impossible to prescribe ways that will guarantee whether or when a nurse becomes a caring professional. Experts disagree as to whether caring is teachable or fundamentally a way of being. Cook and Cullen (2003) wrote about the importance of teaching caring as an integral part of a nursing curriculum. In order for the value of caring to be internalized by student nurses, caring behaviours must be demonstrated, and clinical opportunities to practise these behaviours must be built into the program. Caring models are essential to help in the development of a student's capacity to care (Roach, 1992). For example, Watson's nursing model has been adopted by many nursing programs in which the concept of caring is integrated throughout the curriculum.

For people who view caring as a normal part of their lives, caring is a product of their cultures, values, experiences, and relationships with other people. Persons who do not experience care in their lives often find it difficult to act in caring ways. As nurses deal with health and illness in their practice, their ability to care grows. Nursing behaviours that show caring include providing presence, a caring touch, and listening in each encounter with patients.

Providing Presence

Providing **presence** is to have a person-to-person encounter that conveys closeness and a sense of caring. Fredriksson (1999) explained that presence involves "being there" and "being with." "Being there" is not only physical presence but also communication and understanding. The interpersonal relationship of "being there" seems to depend on the fact that a nurse is attentive to the patient (Cohen et al., 1994). You offer this type of presence to the patient with the purpose of achieving some goal, such as support, comfort, or encouragement; to diminish the intensity of unwanted feelings; or for reassurance (Fareed, 1996; Pederson, 1993).

"Being with" is also interpersonal. It means being available and at your patients' disposal (Pederson, 1993). If patients accept the nurse, they will invite the nurse to see and share

their vulnerability and suffering. One person's human presence never leaves another person unaffected (Watson & Foster, 2003). The nurse then enables the patient to articulate his or her feelings and to understand himself or herself in a way that leads to identifying solutions, seeing new directions, and making choices (Gilje, 1997).

By establishing presence—through eye contact, body language, voice tone, listening, and having a positive and encouraging attitude—you create openness and understanding. The message conveyed this way is that the patient's experience matters to you (Swanson, 1991). Establishing presence with a patient enhances your ability to learn from the patient, which enhances nursing care.

It is especially important to establish presence when patients are experiencing stressful events or situations. Awaiting a physician's report of test results, preparing for an unfamiliar procedure, and planning to return home after a serious illness are just a few events in the course of a person's illness that can create unpredictability and dependency on health care providers. Your presence can help calm a patient's anxiety and fear in such situations. Giving reassurance and thorough explanations about a procedure, remaining at the patient's side, and coaching the patient through the experience all convey caring, which is invaluable to the patient's well-being.

Touch

Patients face situations that can be embarrassing, frightening, and painful. Whatever the feeling or symptom, patients look to nurses for **comfort**. Touch is one comforting approach in which the nurse communicates concern and support.

Touch is relational and leads to a connection between nurse and patient. Touch involves contact (physical) and noncontact touch. Contact touch involves obvious skin-to-skin contact, whereas noncontact touch refers to eye contact. It is difficult to separate the two. Both are described within three categories: task-orientated touch, caring touch, and protective touch (Fredriksson, 1999).

Nurses use task-orientated touch when performing a task or procedure. Skillful and gentle performance of a nursing procedure conveys security and a sense of competence. An expert nurse learns that any procedure is more effective when administered carefully and with consideration for any patient concern. For example, if a patient is anxious about a procedure such as an insertion of a nasogastric tube, the nurse provides comfort through full explanation of the procedure and what the patient will feel. The nurse then assures the patient that the procedure will be performed safely, skillfully, and successfully. This assurance is conveyed in the way that supplies are prepared, the patient is positioned, and the nasogastric tube is gently manipulated and inserted. Throughout the procedure, the nurse talks quietly with the patient to provide reassurance and support.

Caring touch is a form of nonverbal communication that successfully influences a patient's comfort and security, enhances self-esteem, and improves reality orientation (Boyek & Watson, 1994). The nurse can express this caring touch by holding a patient's hand, by giving the patient a back massage, by gently positioning a patient, or by participating in a conversation. When using a caring touch, the nurse is making a connection by showing acceptance of the patient (Tommasini, 1990).

Protective touch is a form of touch that protects the nurse, the patient, or both. The patient views it either positively or

negatively. The most obvious form of protective touch is in preventing an accident, such as holding and bracing the patient to avoid a fall. This protects the patient. Sometimes nurses withdraw from a patient or distance themselves when they are unable to tolerate suffering or need to escape from a tense situation. This protects the nurse but elicits negative feelings in a patient (Fredriksson, 1999).

Because touch conveys many messages, it must be used with discretion. Touch itself is a concern when crossing cultural boundaries of either patients or nurses (Benner, 2004). Patients generally permit task-orientated touch because most individuals give nurses and doctors authority to enter their personal space to provide care. However, exceptions can exist because of patients' cultural backgrounds. You should understand whether patients are accepting of touch and how they interpret your intentions.

Listening

Caring involves an interpersonal interaction that is much more than two people simply talking back and forth. In a caring relationship, the nurse establishes trust, opens lines of communication, and listens to the patient (Figure 18-1). Listening is key, because it conveys the nurse's full attention and interest. Listening includes "taking in" what a patient says, as well as interpreting and understanding what the patient is saying and conveying that understanding to the person talking (Kemper, 1992). Listening to the meaning of what a patient says helps create a mutual relationship. True listening leads to truly knowing and responding to what really matters to the patient and family (Boykin et al., 2003).

When an individual becomes ill, he or she usually has a story to tell about the meaning of the illness. Any critical or chronic illness affects all of a patient's life choices and decisions and sometimes the individual's identity. Being able to tell that story helps the patient deal with the distress of illness. Thus, a story needs a listener. Frank (1998) described his own feelings during his experience with cancer, saying that he needed a health care provider's gift of listening in order to make his suffering a relationship between them instead of an iron cage around him. He needed to be able to express what he needed when he was ill. Personal concerns that are part of a patient's illness story are what is at stake for the patient. Caring through listening enables the nurse to be a participant in the patient's life.



Figure 18-1 Nurse listening to a patient.

To listen effectively, listeners need to silence themselves (Fredriksson, 1999). Fredriksson described silencing one's mouth and also one's mind: that is, to silence one's own thoughts that might distract from fully listening to a patient. It is important to remain intentionally silent and to concentrate on what patients have to say. You need to be able to give patients your full, focused attention as they tell their stories.

When an ill person chooses to tell his or her story, it involves reaching out to others. Telling the story implies a relationship that can develop only if the clinician exchanges his or her stories as well. Frank (1998) argued that professionals do not routinely take seriously their own need to be known as part of a clinical relationship. Yet, unless professionals acknowledge this need, the relationship is not reciprocal; it is only an interaction (Campo, 1997). The clinician is pressured to know as much as possible about the patient, but this pressure isolates the clinician from the patient. In contrast, in knowing and being known, each supports the other (Frank, 1998).

Through active listening, you begin to truly know the patient and what is important to him or her (Bernick, 2004). Learning to listen to a patient is sometimes difficult. It is easy to become distracted by tasks at hand, colleagues shouting instructions, or other patients waiting to have their needs met. However, the time you take to listen is worthwhile both in the information gained and in the strengthening of the nurse-patient relationship. Listening involves paying attention to the individual's words and tone of voice and understanding his or her perspective. Chapter 17 provides more detailed information on the art of communication. By observing the expressions and body language of the patient, you will find cues to help assist the patient in exploring ways to achieve a greater sense of peace and well-being.

Knowing the Patient

One of the five caring processes described by Swanson (1991) is knowing the patient. This concept comprises both your understanding of a specific patient's situation and your subsequent selection of interventions (Radwin, 1995). Knowing develops over time as you learn the clinical conditions within a specialty and the behaviours and physiological responses of patients. Intimate knowing helps you respond to what really matters to the patient (Bulfin, 2005). To know a patient means that you avoid assumptions, focus on the patient, and engage in a caring relationship with the patient so that you can detect information and cues that facilitate critical thinking and clinical judgements (see Chapter 7 for further details on nursing values and ethics). Knowing that the patient is at the core of the process, you use this process to make clinical decisions. By establishing a caring relationship, you develop the understanding that helps you better know the patient as a unique individual and choose the most appropriate and helpful nursing therapies.

The caring relationships that you develop over time, coupled with your growing knowledge and experience, enable you to detect changes in a patient's clinical status. Expert nurses develop this ability to detect such changes almost effortlessly. Clinical decision making, perhaps the most important nursing responsibility, involves various aspects of knowing the patient: responses to therapies, routines, and habits; coping resources; physical capacities and endurance; and body typology and characteristics (Tanner et al., 1993). Experienced nurses know additional facts about their patients, such as their experiences, behaviours, feelings, and perceptions (Radwin, 1995). When you make clinical decisions accurately in the

context of knowing a patient well, patient outcomes are improved. Swanson (1999) noted that when nurses base care on knowing the patient, the patients perceived care as personalized, comforting, supportive, and healing.

The most important thing for a beginning nurse to recognize is that knowing a patient is more than simply gathering data about the patient's clinical signs and condition. Success in knowing the patient depends on the relationship you establish. To know a patient is to enter into a caring, social process that results in "bonding," whereby the patient comes to feel known by the nurse (Lamb & Stempel, 1994). The bonding then enables the relationship to evolve into "working" and "changing" phases so that you can help the patient become involved in his or her care and accept help when needed (Bulfin, 2005).

Spiritual Caring

Spiritual health occurs when a person finds a balance between his or her own life values, goals, and belief systems and those of others (see Chapter 27 for more information on spiritual health). Human beings have physical, emotional, spiritual, and psychological dimensions. An individual's beliefs and expectations do have effects on his or her physical well-being.

Establishing a caring relationship with a patient involves an interconnectedness between the nurse and the patient. This interconnectedness is why Watson (1979, 2006a, 2006b, 2008) described the caring relationship in a spiritual sense. Spirituality offers a sense of connection intrapersonally (connected with oneself), interpersonally (connected with others and the environment), and transpersonally (connected with an unseen higher power). In a caring relationship, the patient and the nurse come to know one another so that the relationship becomes one of healing through the following actions:

- Mobilizing hope for the patient and for the nurse
- Finding an interpretation or understanding of illness, symptoms, or emotions that is acceptable to the patient
- Assisting the patient in using social, emotional, or spiritual resources

Family Care

Each individual experiences life through relationships with others. Caring for an individual does not occur in isolation from that person's family. It is important for you as a nurse to know the family almost as thoroughly as they know the patient (Figure 18-2). The family is an important resource. Success with nursing interventions often depends on the family's willingness to share information about the patient, their acceptance and understanding of therapies, whether the interventions fit with the family's acceptance and understanding of therapies, whether the interventions fit with the family's daily practices, and whether the family supports and provides the therapies recommended.

Many nurse caring behaviours are perceived as most helpful by families of patients with cancer (Box 18-3). Ensuring the patient's well-being and helping the family become active participants in the patient's care are critical for family members. These behaviours, although specific to families of patients with cancer, are useful for developing a caring relationship with all families. Begin a relationship by learning who makes up the patient's family and what family members' roles are in the patient's life. Showing the family care and concern for the patient creates an openness that then enables a relationship to form with the family. Caring for the family takes into



Figure 18-2 The nurse discusses the patient's health care needs with the family.

► BOX 18-3

Nurse Behaviours Perceived by Families as Caring

- Being honest
- Giving clear explanations
- Keeping family members informed
- Trying to make the patient comfortable
- Showing interest in answering questions
- Providing necessary emergency care
- Assuring the patient that nursing services will be available
- Answering family members' questions honestly, openly, and willingly
- Allowing the patient to do as much for himself or herself as possible
- Teaching the family how to keep the patient physically comfortable

Data from Brown, C. L., Holcomb, L., Maloney, J., Naranjo, J., Gibson, C., & Russell, P. (2005). Caring in action: The patient care facilitator role. *International Association for Human Caring Journal*, 9(3), 51–58; Mayer, D. K. (1986). Cancer patients' and families' perceptions of nurse caring behaviors. *Topics in Clinical Nursing*, 8(2), 63–69; and Radwin, L. (2000). Oncology patients' perceptions of quality nursing care. *Research in Nursing & Health*, 23(3), 179–190.

consideration the context of the patient's illness and the stress it imposes on all members. Chapter 19 contains more material on family nursing.

The Challenge of Caring

Assisting individuals during a time of need is the reason that many people enter the field of nursing. When nurses are able to affirm themselves as caring individuals, they reinforce a meaning and purpose to their lives (Benner, 2004; Hoover, 2002). Caring is a motivating force for people to become nurses, and it becomes the source of satisfaction when nurses know they have made a difference in their patients' lives.

It is becoming more of a challenge to care in today's health care system. Being a part of the helping professions is difficult and demanding. Nurses are torn between the human caring model and the task-oriented biomedical model and institutional demands that consume their practice (Watson & Foster,

2003). The time that nurses can spend with patients is diminishing, which makes it much harder to know their patients. Too often, patients are perceived as just cases, and their real needs are either overlooked or ignored. The nature of caring is undermined by reliance on technology, reliance on cost-effective health care strategies, and efforts to standardize and refine work processes. These factors can lead to an increased risk of burnout from the stress and inability to fully practise professional standards that include caring behaviours. It is very important that student and novice nurses are supported in their efforts to be patient-focused.

The CNA has partnered with the Canadian Council on Health Services Accreditation, Health Canada's Office of Nursing Policy, and other important stakeholders to research, develop, and promote quality of work-life indicators (CNA, 2002). These fundamental indicators are designed to help organizations improve the health of their work environments and are important for implementing patient-focused care, preventing burnout, and preserving the practice of caring. Providing safe, compassionate, competent, and ethical care is a hallmark of the CNA (2008) *Code of Ethics*.

The Registered Nurses' Association of Ontario (2006) developed a guideline for nursing best practices that is informed by evidence about how to provide patient-centred care. This guideline includes practice, education, organization, and policy recommendations that can help the individual nurse, educational organizations, and health care organizations implement patient-centred care and integrate the ethic of caring into practice.

If health care is to make a positive difference in their lives, human beings cannot be treated like machines or robots. Instead, health care must become more humanized. Nurses play an important role in making caring behaviours an integral part of the health care delivery. First, nurses must make caring a part of the philosophy and environment in the workplace. By incorporating care concepts into standards of nursing care, nurses establish the guidelines for professional conduct. Finally, during day-to-day practice with patients and families, nurses need to be committed to caring and be willing to establish the relationships necessary for personal, competent, compassionate, and meaningful nursing care.

✦ KEY CONCEPTS

- Caring is at the heart of a nurse's ability to work with people in a respectful and therapeutic way.
- Caring is always specific and relational for each nurse-patient encounter.
- For caring to be effective and meaningful to patients, nurses must learn culturally specific behaviours and words that reflect human caring in different cultures.
- Because illness is the human experience of loss or dysfunction, any treatment or intervention given without consideration of its meaning to the individual is likely to be worthless.
- Swanson's theory of caring includes five caring processes: knowing, "being with," "doing for," enabling, and maintaining belief.
- Roach's caring theory comprises five concepts: compassion, competence, confidence, conscience, and commitment.
- Caring involves a mutual give-and-take that develops as nurse and patient begin to know and care for one another.
- It is difficult to demonstrate caring to patients without gaining an understanding of who they are and their perception of their illness.

- Presence involves a person-to-person encounter that conveys closeness and a sense of caring that involves "being there" and "being with" patients.
- Research has shown that touch, both contact and noncontact, includes task-orientated touch, caring touch, and protective touch.
- The skillful and gentle performance of a nursing procedure conveys security and a sense of competence in the nurse.
- Listening includes interpreting and understanding what is said.
- Knowing the patient is at the core of the process by which nurses make clinical decisions.
- A nurse demonstrates caring by helping family members become active participants in a patient's care.

✦ CRITICAL THINKING EXERCISES

1. Mrs. Lowe is a 52-year-old patient being treated for lymphoma (cancer of the lymph nodes) that occurred six years after lung transplantation. Mrs. Lowe is discouraged about her current health status and a lot of what she describes as muscle pain. The unit where Mrs. Lowe is receiving care has a number of very sick patients and is short-staffed.
 - a. You enter her room to perform a morning assessment and find Mrs. Lowe crying. How are you going to use caring practices to help Mrs. Lowe, knowing that you have only begun your tasks for the day?
 - b. When you listened to Mrs. Lowe, she explained that her muscle pain was very bothersome and it was worse particularly when she was alone. Both you and Mrs. Lowe determine that an injection for her pain would be beneficial. In what way are you caring when you administer the injection to Mrs. Lowe?
 - c. Mrs. Lowe seems more comfortable and is crying less. What else can you do for Mrs. Lowe?
2. During your next clinical practicum, select a patient to talk with for at least 15 to 20 minutes. Ask the patient to tell you about his or her illness:
 - a. What do you believe the patient was trying to tell you about his or her illness?
 - b. Why was it important for the patient to share his or her story?
 - c. What did you do that made it easy or difficult for the patient to talk with you? What did you do well? What could you have done better?
 - d. Would you rate yourself a good listener? How can you listen better?

✦ REVIEW QUESTIONS

1. A nurse hears a colleague tell a student nurse that she never touches the patients unless she is performing a procedure or doing an assessment. The nurse tells the colleague that
 1. She does not touch the patients either
 2. Touch is a type of verbal communication
 3. Using touch is never a problem
 4. Touch forms a connection between nurse and patient
2. Of the five caring processes, "knowing" the patient is best described as
 1. Anticipating the patient's cultural preference
 2. Determining the patient's physician preferences
 3. Gathering task-oriented information during assessment
 4. Establishing an enhanced understanding of the patient's needs

3. Helping a new mother through the birthing experience demonstrates which of the five caring behaviours?
 1. Knowing
 2. Enabling
 3. "Doing for"
 4. "Being with"
 5. Maintaining belief
4. Mr. Kline is fearful of upcoming surgery and a possible cancer diagnosis. He discussed his love for the Bible with Jada, his nurse, and she recommends a favourite Bible verse. Another nurse tells Jada that spiritual caring has no place in nursing. Jada replies:
 1. "Spiritual care should be left to a professional."
 2. "You are correct; expressions of spirituality are a personal decision."
 3. "Nurses should not force their spiritual beliefs on patients."
 4. "Healing can be promoted by assisting the patient in using spiritual resources."
5. A number of strategies have potential for creating work environments that enable nurses to demonstrate more caring behaviours. Some of these include
 1. Increases in working hours
 2. Increases in monetary gain
 3. Flexibility, autonomy, and improvements in staffing
 4. Increases in physicians' input concerning nursing functions
6. A nurse demonstrates caring by helping family members
 1. Become active participants in care
 2. Provide activities of daily living
 3. Remove themselves from personal care
 4. Make health care decisions for the patient
7. Listening is not only "taking in" what a patient says; it also includes
 1. Incorporating the views of the physician
 2. Correcting any errors in the patient's understanding
 3. Injecting the nurse's personal views and statements
 4. Interpreting and understanding what the patient means
8. Presence involves a person-to-person encounter that
 1. Enables patients to care for themselves
 2. Provides personal care to a patient
 3. Conveys a closeness and sense of caring
 4. Describes being in close contact with a patient
9. By considering the patients' perceptions of caring, nurses are better able to
 1. Understand what patients expect of them as caregivers
 2. Be more efficient in performing tasks
 3. Provide continuity of care
 4. Establish nursing priorities

✦ RECOMMENDED WEB SITES

International Association for Human Caring: <http://www.humancaring.org>

The focus of this Web site is to advance nursing and other related disciplines in the knowledge of caring and caring theory. This site provides access to the *International Journal for Human Caring*, a well-recognized journal that details research on caring.

Review Question Answers

1. 4; 2. 4; 3. 2; 4. 4; 5. 3; 6. 1; 7. 4; 8. 3; 9. 1

Rationales for the Review Questions appear at the end of the book.

Family Nursing

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objectives

Mastery of content in this chapter will enable you to:

- Define the key terms listed.
- Discuss how the term *family* can be defined.
- Examine current trends in the Canadian family.
- Discuss how family members influence one another's health.
- Compare family as context, family as patient and family *in* context, explaining how these different perspectives influence nursing practice with families.
- State the three major categories of the Calgary Family Assessment Model (CFAM) and understand subcategories important to consider in a family assessment.
- Describe key concepts of the Calgary Family Intervention Model (CFIM).
- Discuss family nursing as relational inquiry.
- Describe key concepts and approaches to relational inquiry-based practices for family nursing.
- Ask assessment questions to learn relevant information about family functioning in the context of health or illness.
- Discuss the relational approaches and practices needed to conduct a family interview and effectively intervene with the family in nursing practice.

key terms

- | | |
|--|---------------------------------|
| Alliances and coalitions, p. 284 | Emotional communication, p. 283 |
| Beliefs, p. 284 | Family, p. 274 |
| Calgary Family Assessment Model (CFAM), p. 279 | Family forms, p. 274 |
| Calgary Family Intervention Model (CFIM), p. 284 | Family nursing, p. 274 |
| Circular communication, p. 283 | Genogram, p. 281 |
| Circular questions, p. 285 | Hardiness, p. 276 |
| Commendation, p. 286 | Illness narrative, p. 286 |
| Context (families as context, families <i>in</i> context, families as patient), p. 277 | Influence, p. 284 |
| Ecomap, p. 281 | Linear questions, p. 284 |
| | Nonverbal communication, p. 283 |
| | Problem solving, p. 284 |
| | Reciprocity, p. 287 |
| | Relational inquiry, p. 277 |
| | Resiliency, p. 276 |
| | Roles, p. 284 |
| | Verbal communication, p. 283 |

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The role of the family in health care has evolved significantly in previous years. In the early twentieth century, visiting public health nurses and private duty nurses worked closely with family members, providing care in the patient's home. After World War II, with the development of a national health care system in Canada, the location of most nursing services shifted to hospital settings. With these historical changes in health care, families were largely excluded from their relatives' nursing care, while physicians and nurses came to be considered the experts in health care provision (Elliott et al., 2009). Tension between the role of professionals and family members in health care has persisted, although families and nurses have increasingly forged more collaborative relationships. Family nursing is a highly contextual, relational, and skill-based practice in which nurses face complex clinical situations. Within these situations, nurses need to simultaneously attend to the needs of multiple family members and complex environments, as well as the family unit (Registered Nurses' Association of Ontario [RNAO], 2006). An example of the complexity faced in present-day nursing practice would be the care

of families living in rural settings with members admitted to urban hospitals several hundred kilometres from their home (Jackman et al., 2010). The location of a patient's care may create significant challenges for the family in relation to travel, employment, and finances. Other examples include frail seniors isolated from family and friends as they enter the health care system, or recently immigrated parents who must face a child's serious illness in the context of language and cultural barriers.

Within these diverse and challenging clinical and family contexts, nurses strive to provide *family-centred care*, an approach to care that is characterized by dignity and respect, information sharing, patient/family participation, and family-professional collaboration (Institute of Family Centred Care, n.d.). Despite the growing adoption of family-centred care within modern health care settings, implementation of this approach has been challenging. A lack of clarity in conceptual definitions and limitations in the availability of evidence-based practice models have posed significant challenges to the implementation of family-centred care (Franck & Callery, 2004). Wright and Leahey (2009) suggested that family-centred care can be responsibly and respectfully achieved only through the use of clearly articulated relational, family assessment, and family intervention frameworks.

Family nursing is based on the assumption that every person, regardless of age, is a member of some type of family form and carries family experiences that have profound influences on their lives and approaches to health care (Hartrick Doane & Varcoe, 2005). Also central is the assumption that individuals are best understood within the context of the family. A change in one family member, such as an illness or health condition, affects the other family members. Family nursing promotes, supports, and provides for the well-being and health of the family and individual family members (Wright & Leahey, 2009). Nurses need to understand the relational contexts as well as the particular strengths and needs of each family that they encounter in practice. It is also important that nurses work to understand the geo-social, economic, and political influences that shape each family's life experience. Through skilled relational inquiry (Hartrick Doane & Varcoe, 2005) and the use of family assessment and intervention frameworks, nurses can effectively collaborate with families to enhance the unique strengths and resources they possess (Hartrick Doane & Varcoe, 2005; Wright & Leahey, 2009). Nurses are encouraged to move beyond understanding family as an entity and into the sensitive mediation of the nurse-family relationship as well as the relationships shared between family members. The goal of family nursing is to help the family and its individual members achieve and maintain optimal health throughout and beyond the illness experience.

What Is a Family?

Defining *family* within complex relational and clinical contexts is not a simple undertaking. Different definitions have resulted in heated debates among social scientists and legislators. Formal definitions have included understandings of family as a biological or legal entity and social networks complete with personally or institutionally organized values and ideologies. To some patients, family may include only people who are related by marriage, birth, or adoption.

Other patients consider aunts, uncles, close friends, cohabiting people, and even pets as family. Families are as diverse as

the individuals that compose them, and patients, as well as health care providers, hold deeply ingrained beliefs and values about family. It is important that nurses explore these values and beliefs within their nursing practice with families. Thus, **family** is defined as a set of relationships that each patient identifies as family or as a network of individuals who influence each other's lives, regardless of whether actual biological or legal ties exist. In other words, each person has an individual definition of who or what constitutes family (Baumann, 2006).

Your personal beliefs do not have to coincide with those of the patient, but to provide responsive, individualized, and compassionate care, it is important to have an awareness of your own history, values, and beliefs and an understanding that families are diverse in form and expression. Families are unique, each having its own strengths, resources, and challenges (Bell et al., 2001; Hartrick Doane & Varcoe, 2005; Wright & Bell, 2009; Wright & Leahey, 2009). However, some general characteristics of a family include future obligations and caregiving functions, such as protection, nourishment, and socialization of its members (McGoldrick et al., 2011).

Current Trends in the Canadian Family

Although the institution of the family remains strong, the family itself is changing. You should be aware of current trends and social factors that affect the structure and function of the family. The following information about current family trends is based on data from Statistics Canada's 2006 censuses (Statistics Canada, 2012).

Family Forms

Family forms are patterns of people considered by family members to be included in the family (Box 19-1). Although all families have some common characteristics, each family form has unique challenges and strengths. You are encouraged to maintain an open mind about what constitutes a family so that potential resources and concerns are not overlooked.

Divorce rates have increased dramatically since the 1950s, and although the rate seems to be dropping, it is now estimated that 41% of Canadian marriages will end in divorce (Statistics Canada, 2012). Many divorced adults eventually remarry or form new family units, which results in blended families with complex sets of relationships among step-parents, stepchildren, half-brothers and half-sisters, and extended family members. When transitioning to a blended family, parents undergo difficult emotional challenges, while simultaneously managing the intense sadness, anger, and confusion experienced by children, extended family members, friends, and ex-spouses. Divorced and re-coupled families require an entirely new paradigm as they move forward in family life (McGoldrick et al., 2011).

For many years, lesbian, gay, bisexual, and transgender individuals have participated in family through their membership in families of origin, as well as in the families they have chosen to create both within and outside the context of legal marriage (McGoldrick et al., 2011). These individuals and couples face multiple challenges within the family life cycle, including those associated with identity development, the process of coming out, coupling, parenting, and transitions in later life. For more information, see *The Expanded Family Life-cycle: Individual, Family, and Social Perspectives* (McGoldrick et al., 2011, pp. 115-132).

► BOX 19-1 Family Forms

Traditional Nuclear Family

Consists of a mother and father (married or common-law) and their children

Extended Family

Includes the nuclear family and other relatives (perhaps grandparents, aunts, uncles, cousins)

Step-Family

Formed when at least one child in a household is from a previous relationship of one of the parents

Blended Family

Formed when both parents bring children from previous relationships into a new, joint living situation or when children from the current union and children from previous unions are living together

Lone-Parent Family

Consists of one parent and one or more children. The lone-parent family is formed when one parent leaves the nuclear family because of death, divorce, or desertion or when a single person decides to have or adopt a child.

Other Family Forms

Family forms and family relationships within Canada have become increasingly diverse. They include married and common-law couples without children, families in which grandparents provide care for their grandchildren, adults living alone, and same-sex couples (with or without children). The rates of traditional families (two married parents and children living together) in Canada is declining, while the proportion of common-law and single-parent families is increasing. Single-parent families accounted for 25.8% of Canadian families in 2006 (Statistics Canada, 2006).

Grandparents have increasingly taken responsibility for the raising of grandchildren. In 2011, about 0.5% of all grandparents were living with their grandchildren without either of the children's parents involved (Statistics Canada, 2012). This parenting responsibility is often a consequence of legal intervention when parents are deemed unfit or renounce their parental obligations.

Family Changes and Challenges: Understanding the Influence of Sociocultural Contexts

Sociocultural and economic changes are significantly increasing challenges to family health. Many families find themselves unable to respond effectively to complex family challenges (e.g., violence, addictions, illness, learning disabilities, cognitive decline and/or dementia). These family challenges can undermine existing relationships of care, leaving family members more vulnerable and socially isolated during times when support is most needed (Luxton, 2011). Recognizing these changes and challenges is crucial within family nursing assessment and intervention.

Teenage Pregnancy

The rate of teenage pregnancies in Canada has dropped dramatically, having decreased 36% between 1996 and 2006 (Canadian Federation for Sexual Health, 2007; McCay & Barrett, 2010). Nevertheless, adolescents who give birth are now more likely to raise their children as single parents or

within the context of extended family units rather than placing their children for adoption (Canadian Federation for Sexual Health, 2007). A teenage pregnancy often has significant health and social consequences for children and mothers and can severely strain family relationships and family resources. In addition, these families are at increased risk for living in poverty related to disruptions in maternal education and limited career opportunities.

Domestic Roles

Domestic roles have become more complex as families are increasingly made up of two wage earners or living in single person households (Statistics Canada, 2012). Balancing employment and domestic responsibilities creates a variety of challenges with regard to child and elder care, as well as household work. Concerns that maternal employment is detrimental to children's development and well-being are limited and unsubstantiated (Brooks-Gunn et al., 2010). However, finding high-quality child care and managing domestic tasks can be a major challenge. Management of domestic tasks and parenting responsibilities varies substantially from family to family. Many fathers are now expected and want to participate more fully in day-to-day parenting responsibilities. Additionally, cultural groups such as Aboriginal, European, African, Asian, and South Asian communities have historically valued and maintain extended family involvement in family caregiving (Luxton, 2011) (see Chapter 9).

Economic Status

In 2011 the median annual income of Canadian families was about \$76,600. The median annual income for lone-parent households was \$46,800 (Statistics Canada, 2012). Distribution of wealth greatly affects the capacity to maintain health. Low educational preparation, poverty, and decreased amounts of support all magnify the impact of illness on the family and increase the amount of illness in the family.

Aboriginal Families

Individual, family, and community impacts of social and health inequities and disparities in Canadian society are profound (Adelson, 2005) and require nursing attention. Aboriginal families are the fastest-growing group with children younger than 24 years. They are undergoing substantial changes while trying to maintain traditional culture, structure, and function. Aboriginal families, in their multigenerational form, often consist of a network of grandparents, parents, children, aunts, uncles, and cousins. Each member has obligations to the family. Children are held in high esteem and are expected to be treated gently and protected from harm (Castellano, 2002). Aboriginal families tend to be larger and younger and contain more diverse family members than non-Aboriginal families. Each group of Aboriginal peoples has its own traditions, rituals, relationships, and functions that need to be taken into account in nursing care. The Calgary Family Assessment and Intervention Models (Wright & Leahey, 2009), as well as Hartrick Doane and Varcoe's (2005) approach to family nursing as relational inquiry can assist nurses in creating a sensitivity and attentiveness to both the strengths and challenges faced by the Aboriginal families they encounter in practice.

Family Caregivers

Those 80 years of age and older are Canada's fastest-growing age group. One out of every seven Canadians is a senior

citizen. Life expectancy is 82.5 years for women and 77.7 years for men (Statistics Canada, 2012). The aging population has affected the family life cycle, especially the middle generation, as many family members serve as informal caregivers for older adults and other persons with disabilities. The majority of these caregivers are women, and they frequently provide 10 hours or more of unpaid assistance per week (Duxbury et al., 2009). Family caregiving involves the routine provision of services and personal-care activities for a family member by spouses, siblings, or children. Caregiving activities include personal care (bathing, feeding, or grooming), monitoring for complications or side effects of medications, instrumental activities of daily living (shopping or housekeeping), and ongoing emotional support. The respite needs of family caregivers are an important aspect of assessment and intervention given the changes occurring within the sociocultural and economic contexts of family health.

Although family caregivers often find that providing care has many rewards, this group frequently must balance caring for a family member with many other ongoing demands (e.g., raising children, working full-time, or dealing with personal problems or illness) and may suffer physical and emotional health challenges related to the competing demands (Duxbury et al., 2009). Box 19-2 provides a list of family nursing gerontological concerns.

The Family and Health

The family is the primary context in which health promotion and disease prevention take place (Box 19-3). The health of the family is influenced by many factors such as biology, social status, economic resources, politics, violence, and geographical and environmental contexts. Each family's beliefs, values, and practices also strongly influence the health-promoting behaviours of its members (Hartrick Doane & Varcoe, 2005, 2006). The health status of each individual influences how the family unit functions and its ability to achieve its goals. When the family meets its goals, its members tend to feel positive about themselves and their family. Conversely, when they do not meet goals, families may view themselves as ineffective.

* BOX 19-2 FOCUS ON OLDER ADULTS

- Nurses need to carefully consider caregiver strain; caregivers are typically older adults whose own physical stamina may be declining, or middle-age children who often have other responsibilities.
- Older families have a different social network than younger families; friends and same-generation family members may have died or have been ill themselves. Nurses can look for social support within the community and within the patient's religious affiliation.
- Physical health impairments increase the risk of depression in older adults.
- As in the other stages of life, members of older families need to work on developmental tasks (see Chapter 24).
- Abuse of older adults occurs across all social classes, with family members and family caregivers the most frequent abusers (Ford-Gilboe et al., 2011). Unexplained bruises and skin trauma should not be ignored by health care providers.



Attributes of Healthy Families

Researchers have focused on hardiness and resiliency as mediating factors for long-term health. Hill's (1958, 2003) classic research attempted to explain the reactions of crisis-proof and crisis-prone families in order to foster strength. A crisis-proof, or effective, family can integrate the need for stability with the need for growth and change. This type of family has a flexible structure for task performances and is receptive to help from outside the family system while maintaining a sense of strength and stability. An effective family exerts influence on the immediate environment of home, neighbourhood, and school, whereas a crisis-prone family may lack, or believe it lacks, control over these environments.

Family **hardiness** has been defined as the internal strengths and durability of the family unit and is characterized by a sense of control over the outcome of life, perceiving change as beneficial and growth producing, and active rather than passive approaches to stressful events (McCubbin et al., 1996). A hardy family can thus transcend inevitable lifestyle changes. Family **resiliency** is the ability to cope with expected and unexpected stressors: role changes, developmental milestones, and crises. The goal of the family is not only to survive the challenge but also to thrive and grow with knowledge acquired in the challenge.

Black and Lobo (2008) defined *family resiliency* as successful coping under conditions of stress and adversity that enables individuals and the family unit to flourish with support. Factors influencing family resiliency include positive outlook; spirituality; flexibility; cohesiveness; clear communication; financial management; shared family involvement in recreation, routines, and rituals; and support networks. Communication is particularly crucial to resilience and general family functioning. It enables individuals within a family unit to express needs, wants, and concerns to one another. Through communication, family members are able to resolve everyday challenges, promote health of all members, and develop resilience for extraordinary challenges (Black & Lobo, 2008; Svavarsdottir et al., 2000).

Health promotion programs, psychosocial supports, and family counselling or therapy aimed at enhancing communication and other resiliency attributes are available for families and children in many communities. Nurses need to make themselves aware of family-oriented community resources so that families can be referred as needed.

* BOX 19-3 FOCUS ON PRIMARY HEALTH CARE

Family nursing practice focuses on the active collaboration with individual members and the family unit with the goal of supporting their efforts to reach optimal levels of health and well-being. Community health nurses meet families in a wide variety of primary health care settings and have many opportunities to implement holistic family nursing practices. Nursing practices in health promotion include but are not limited to neonatal assessments, bereavement visits, school health care, occupational health care, substance abuse programs, palliative care, infusion clinics, and home care. Research has shown that these nursing interventions have a positive impact on the health outcomes of families (MacMillan et al., 2009).



Family Nursing Care

A collaborative relationship with family members must be based on mutual respect and trust. Nurses should examine family patterns, relationships, and interactions when they consider how a health challenge or illness affects a family and how a family affects a health challenge or illness (Leahey & Harper-Jaques, 1996). A nurse's relationship with the family has a significant influence on patient/family functioning and health outcomes (Leahey & Harper-Jaques, 1996; MacMillan et al., 2009) (Figure 19-1).

Although health care systems in the past tended to emphasize the individual, a family focus is now needed in order to be able to safely discharge patients to the care of the family or community settings. There is also a pressing need to address the challenges faced by multiple family members, the patient, and the family unit within nursing practice. To begin working with families, you must have scientific knowledge of family theory and family nursing. Family nursing care focuses on family as context, family as patient, and an understanding of families *in* context. The approaches used depend on the particular situation and the self-awareness and abilities of the nurse.

Family as Context

When considering the family as **context**, you focus either on the individual patient within the context of his or her family, or on the family with the individual as context (RNAO, 2006). The approach used relates to the clinical setting, clinical problem, and practical considerations. An example of the first approach is a situation in which a nurse interviews a man with heart disease, asking the man's wife about the family's diet and possible family stressors. The wife's ability to support her husband's efforts at changing eating patterns and use of stress management techniques are also assessed. The main focus is on the health of the patient within the environment of the family. An example of the second approach is a situation in which a community health nurse interviews the adult daughter of a woman with multiple sclerosis, discussing how she is coping with her mother's care. Family members may need direct support and nursing intervention themselves.

With both approaches, you assess the extent to which the family supports the individual's basic needs. Family members are considered valuable resources for assessment

and intervention. They provide information about how they have been helping the patient maintain health and manage health problems. When patients are unable to communicate, families provide important information about the patient and indicate the patient's wishes. Nurses need to be competent at considering the family as context. Even if there is no opportunity to involve the family directly, you still consider the patient as a member of a family.

Family as Patient

When approaching the family as patient, you focus on the entire family: its processes and relationships (e.g., parenting, impacts of the marital relationship, or family caregiving). Family patterns and interactions among family members are the focus, rather than individual characteristics. The nursing process concentrates on how these patterns and processes are consistent with achieving and maintaining family and individual health. Nursing practice that focuses on family as patient is also known as *Family Systems Nursing* and requires in-depth knowledge of family dynamics and family systems theory (Wright & Leahey, 2009). Therefore, nurses who specialize in Family Systems Nursing often have advanced skills and training. An interdisciplinary approach is helpful when dealing with complex family systems. It is important that you are aware of the limits of nursing practice and make referrals when appropriate. Considering the family as the patient, you aim to support communication and healthy family functioning among family members (Wright & Leahey, 2009). Often you must support conflict resolution between family members so that each member can confront and resolve challenges in a healthy way. You also may link family members to external and internal resources as necessary. Ultimately, your aim is to help the family achieve optimal functioning.

Understanding Family in Context: Family Nursing as Relational Inquiry

Family nursing as relational inquiry invites nurses to consider the ways in which families and nurses are embedded within diverse and complex life contexts. Hartrick Doane and Varcoe (2005) articulated the importance of critically attending to the social, political, economic, and geographical contexts that influence both family members and nurses who care for them. Nurses need to continually explore how personal and professional definitions of *health* and *family* may shape, and possibly constrain, their nursing practice with families (p. 24). A nurse's perceptions, values, and beliefs about the meaning of family can greatly influence the quality of the therapeutic relationship, the health of patients and families, and the quality of work life experienced by nurses. A **relational inquiry** approach asks nurses to expand their contextual knowledge of families, developing a more in-depth and comprehensive consideration of the historical, economic, political, social, environmental, and geographical influences at play when families encounter illness or other difficulties related to life transitions.

The nurse's awareness of his or her own values and beliefs as well as a critical, reflective consideration of different understandings of health and family will enhance the nurse's ability to hear the unique stories of family members' lives. Nurses must explore potential biases they may hold, how those biases may influence the questions they ask, and their ability or inability to listen for and to the experiences of family members.

This practice is guided by a number of relational capacities that have been described by Hartrick Doane and Varcoe (2005).



Figure 19-1 Nurse (left) and family members.

► BOX 19-4 Relational Capacities

Key concepts of relational practice with families:

- Self-awareness (in relationship with others)
 - Context/Culture
 - Perception/Personal Meaning
 - Relational Capacity (approaches identified in detail below)
- Relational capacities:
- Ways of being in relationship
 - Presencing/mindfulness
 - Synchrony/mutuality
 - Capacity for ambiguity
 - Intentionality/congruence
 - Genuineness
 - Warmth
 - Respect
 - Attending/listening (including listening for difference)
 - Boundaries
 - Understanding another's personal meaning
 - Empathy
 - Clarification/perception checking/verbalizing the implied
 - Validating
 - Question posing, focusing, and reflecting
 - Use of silence
 - Summarizing/placing events in a time sequence
 - Expressing/sharing your own personal meaning
 - Constructive giving/receiving of feedback
 - Assertiveness
 - Conflict resolution
 - Sharing information

Source: Adapted from Hartrick Doane, G., & Varcoe, C. (2005). *Family nursing as relational inquiry: Developing health promoting practice* (p. 288; Box 7.1). Philadelphia, PA: Lippincott Williams & Wilkins.

These skills include listening, questioning, empathy, mutuality, reciprocity, self-observation, reflection, and a sensitivity to emotional contexts (also see Chapter 17). This approach highlights working across differences and acknowledging that power and differences are important, often invisible, features of relationships. This practice begins by entering into relation, enquiring into the family health and healing experience, following the lead of families, and learning to let be (see Box 19-4). Within your own practice, consider how you might look beyond the surface of patients and families, entering your practice with an approach of inquiry, while drawing on the assessment and intervention processes described in Box 19-5.

Assessing the Challenges, Strengths, and Needs of the Family: The Calgary Family Assessment Model

Family assessment skills are also essential in providing responsive, compassionate, and respectful family care and support. To help families adjust to acute and chronic illness, nurses need to understand the relationships that family members share, what the illness means to family members, how the illness has influenced family functioning, how the family has been affected by the illness, and the support that the family is most in need of (Neabel et al., 2000; Wright & Leahey, 2009). Box 19-6 lists the particular features of families who should be considered for a

► BOX 19-5 Relational Inquiry: Assessing and Intervening Approaches

1. Entering Into Relation: Getting "in Sync" With a Family

- Conscious participation—Walking alongside the family
- Stopping to look, listen, and hear
- Unconditional positive regard
- Being in sync

2. Being in Collaborative Relation: Staying "in Sync"

- Family and nurse working together to assess and intervene

3. Inquiring Into the Family Health and Healing Experience

- Inquiry into what is meaningful to the family
- Keeping family at the centre of view

4. Following the Lead of Families

- Taking cues from families
- Taking a stance of curiosity, unknowing, and uncertainty
- Using theoretical knowledge to enhance sensitivity to family experience
- Scrutinizing theoretical and expert knowledge against family experience

5. Listening to and for

- Listening through phenomenological, critical, spiritual, and socioenvironmental health-promotion lenses

6. Self-Observation

- Participating consciously and intentionally
- Self-knowing

7. Letting Be and Change

- Letting be to know who this family is and what is happening for them
- Creating the opportunity for family to come to know more about their own experience, patterns, capacities, challenges, and contextual constraints

8. Collaborative Knowledge Development

- Drawing on family knowledge (experiential, historical, sociocultural), and drawing on nursing knowledge (scientific, theoretical, biomedical, political, practical)

9. Pattern Recognition

- Identifying underlying patterns of experience and responses
- Identifying patterns of capacity and capacity-adversity

10. Naming and Supporting Capacity

- Seeing and recognizing strengths
- Looking beyond the surface
- Honouring the family's version of the story
- Working with the family to enhance capacity and address adversity

11. Emancipatory Action

- Recognizing and naming inequities and structural conditions
- Drawing on and sharing contextual knowledge
- Introducing alternative discourses
- Devoting energy to remedying structural inequities and creating coalitions

Source: Adapted from Hartrick Doane, G., & Varcoe, C. (2005). *Family nursing as relational inquiry: Developing health promoting practice* (p. 288; Box 7.1). Philadelphia, PA: Lippincott Williams & Wilkins.

family assessment. During an assessment, the nurse, patient, and family engage relationally and collaboratively in conversation to share information with each other and explore family members' experiences of illness, while simultaneously reflecting on issues important to the patient and family's well-being.

► BOX 19-6

Features of Families Who Should Be Considered for a Family Assessment

Families who may benefit most from a family assessment include those who

- Are experiencing emotional, physical, or spiritual suffering or disruption caused by a family crisis (e.g., acute, chronic, or life-threatening, illness, injury, death, addiction, and/or suspected family violence)
- Are experiencing emotional, physical, or spiritual suffering or disruption caused by a developmental milestone (e.g., birth, marriage, child leaving home)
- Define a problem or illness as a family issue (e.g., the impact of chronic illness on the family)
- Have a child or adolescent whom they identify as having difficulties (e.g., bullying at school, fear of cancer treatment)
- Are experiencing issues that are serious enough to jeopardize family relationships (e.g., terminal illness, abuse, addictions)
- Have a family member who is about to be admitted to the hospital for psychiatric or mental health care
- Have a child admitted to the hospital

Source: Adapted from Wright, L. M., & Leahey, M. (2009). *Nurses and families: A guide to family assessment and intervention* (5th ed., p. 5). Philadelphia, PA: F. A. Davis Company.

The **Calgary Family Assessment Model (CFAM)** is a relational, strengths-focused practice model that guides nurses in the completion of comprehensive family assessment (Wright & Leahey, 2009). The CFAM has received international recognition and has been adopted by schools of nursing around the world. The CFAM focuses on three major categories of family life: structural, developmental, and functional dimensions. Each category has several subcategories; however, not all subcategories will be relevant to every family (Figure 19-2). Nurses must decide, on a family-by-family basis, which subcategories are most relevant. Using too many subcategories may result in an overwhelming amount of data and questions for family members; using too few may yield insufficient data, which can distort a family's strengths and/or challenges. The model can be consulted during discussions about family issues.

Structural Assessment

The structural dimension of the family assessment includes:

- **Internal structure:** the people who are included in the family and how they are relationally connected to one another
- **External structure:** the relationships the family shares with people and institutions outside of the family unit
- **Context:** the whole situation or background relevant to the family

Internal Structure. The internal structure of the family—the composition and relationships shared by family members—can be further divided into six subcategories: family composition, gender, sexual orientation, rank order, subsystems, and boundaries.

Family Composition. *Family composition* refers to the individual members who form the family. The family

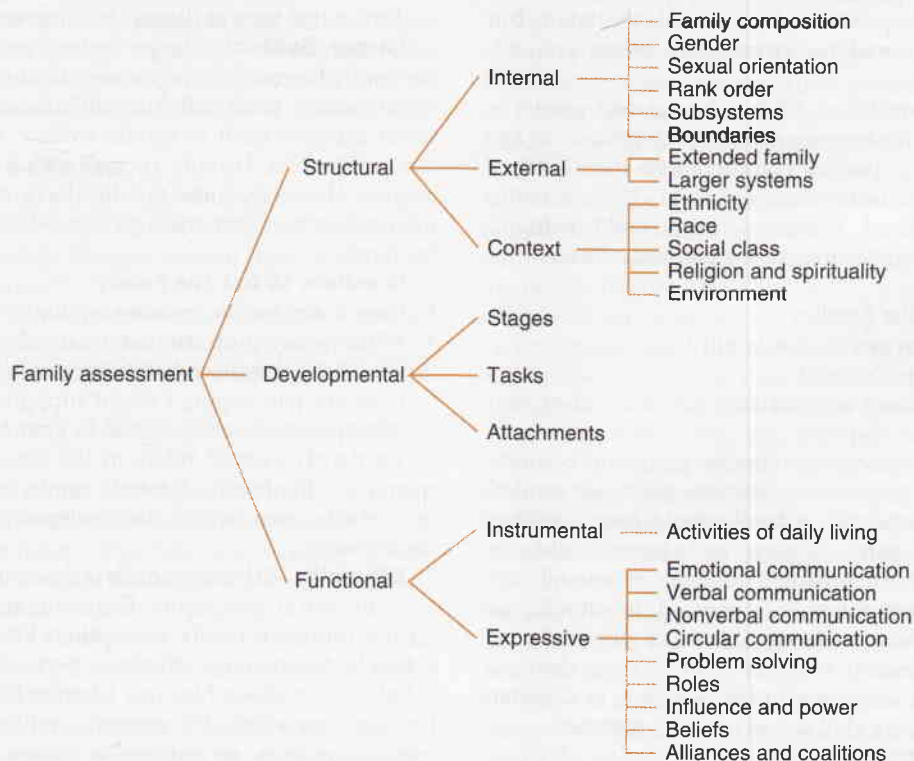


Figure 19-2 Branching diagram of the Calgary Family Assessment Model (CFAM). **Source:** Wright, L. M., & Leahey, M. (2009). *Nurses and families: A guide to family assessment and intervention* (5th ed., p. 48, Fig. 3-1). Philadelphia, PA: F. A. Davis.

composition is not limited to the traditional, nuclear family; it may include any of the various family forms, which were previously discussed (see Box 19-1). It is important to note whether any recent additions or losses in the family composition have occurred.

Questions to Ask the Family

- Who is in your family?
- Does anyone else live with you: for example, grandparents, boarders?
- Has anyone recently moved out of your household, married, or died?
- Can you think of anyone else who is like a family member but is not biologically related?

Gender. *Gender* is the set of beliefs about or expectations of masculine and feminine behaviours and experiences. These beliefs are fundamental to intimate relationships and are influenced by culture, religion, and family. It is useful to understand how male and female members of a particular family may view and experience the world differently.

Questions to Ask the Family

- How have your parents' ideas about masculinity and femininity affected your own? Have your ideas about gender been challenged in any way since you became parents?
- Do you have expectations of your children on the basis of their gender?
- Is the division of labour at home based on gender roles?

Sexual Orientation. *Sexual orientation* refers to heterosexual, homosexual, bisexual, or transgendered orientation (see Chapter 26). Heterosexism, a belief that male–female bonding is the only legitimate type of bonding, is a form of bias that can affect families and health care providers. Discrimination based on sexual orientation remains a problem. Unless relevant to the patient or family's presenting concern, you do not usually ask questions about sexual orientation, but avoid stereotyping or making assumptions when you ask general questions.

Rank Order. The order of children by age and gender is called *rank order*. The birth order, gender, and distance in age between siblings are important considerations because they may influence roles and behaviours. The child's characteristics and the family's idealized "program" for the child (going to school, college, university, work, getting married, and so forth) are also important.

Questions to Ask the Family

- How many children are in your family?
- What are the children's ages?
- Do you have distinct expectations for the oldest and younger children?

Subsystems. *Subsystems* are smaller groups of relationships (i.e., based on generation, interests, skills, or gender) within a family. For example, a family could have a sibling subsystem, a husband–wife subsystem, and a parent–child subsystem. Each family member usually belongs to several subsystems, and in each subsystem, they play a different role, use different skills, and have a different level of power (i.e., a teenager behaves differently with her younger sister than she does with her father). Adapting to the demands of different subsystems is a necessary skill for each family member.

Questions to Ask the Family

- What groups have you noticed in your family?
- Are there times when disagreements occur among and between the subgroups in your family?

- If your family had more or fewer subgroups, what effect do you think that might have? What might you most like to change about the subgroups in your family?

Boundaries. Boundaries define family subsystems and distinguish one subsystem from another. They influence how members participate in each subsystem. For example, a child in a parent–child subsystem may be given certain responsibilities and power but is not expected to be involved with family decision making. Boundaries can be weak, rigid, or flexible, and they change over time as family members age or are gained or lost.

Questions to Ask the Family

- Whom do you talk with when you feel happy? Who do you talk to when you feel sad?
- Does the family have any "unwritten" rules about topics never to be discussed outside of the family?

External Structure. *External structure* refers to the connections that family members have to persons outside the family. Two subcategories of external structure exist: extended family and larger systems.

Extended Family. *Extended family* includes the family of origin, the current generation, and step-relatives. How each member sees himself or herself as an individual, yet also as part of the family, should be critically assessed. You should note whether family members make many references to the extended family during the interview and inquire about the nature of the relationships shared with extended family members.

Questions to Ask the Family

- Where do your parents live? How often do you have contact with them and your siblings?
- Which family members do you see or speak with regularly? Who in your extended family are you the closest to?
- Have members of your extended family been helpful to you during this time of illness? In what way?

Larger Systems. *Larger systems* are groups with whom the family has meaningful contact. Groups include health care organizations, work, religious affiliations, school, friends, and social agencies such as public welfare, child welfare, foster care, and courts. Usually, contact with such larger systems is helpful. However, some families have difficult relationships with individuals from these groups, which can create stress for the family.

Questions to Ask the Family

- How many health agencies regularly interact with you?
- What agency professionals are involved with your family? How have they been helpful or not helpful to your family? How are you hoping I might support you differently than other professionals involved in your family's care?

Context. *Context* refers to the situation or background relevant to the family. A family can be viewed in the context of ethnicity, race, social class, religion and spirituality, and environment.

Ethnicity. *Ethnicity*, which is the concept of a family's cultural, historical, geographic, linguistic, and ethnic heritage can greatly influence family interaction. Ethnicity may influence a family functioning, structure, perspectives, values, health beliefs, and philosophies (see Chapter 9). Cultural and ethnic heritage can affect, for example, religious practices, child-rearing practices, recreational activities, and nutrition. Individually focused assessment is important as different members of an ethnic group may subscribe to differing beliefs, traditions, and restrictions, even within the same generation.

Questions to Ask the Family

- Do you think of your family as having a strong ethnic identity?
- Has your ethnic background influenced your health care?
- Could you tell me about ethnic traditions you practise? How are these traditions helpful to your family?

Race. Race (biological characteristics such as skin and hair colour) influences individual and group identification and is closely connected to ethnicity. Family members' interactions among themselves and with health care providers are influenced by racial attitudes, stereotypes, and discrimination. If ignored, these influences may constrain the nurse and family's relationship.

Questions to Ask the Family

- If you and I were of the same race, would our conversation be different? How?

Social Class. Social class is shaped by education, income, and occupation. Each class has its own values, lifestyles, and behaviours that influence family interaction and health care practices.

Questions to Ask the Family

- What is your job? How many hours a week do you work? How does this affect family life?
- Does anyone in the family work shifts? How does that influence your family functioning?
- What level of education have you completed?
- Does your family have economic challenges at this time?

Religion and Spirituality. Family members' spiritual or religious beliefs, rituals, and practices can influence their ability to cope with or manage an illness or health concern (McLeod, 2003; McLeod & Wright, 2001, 2008; Walsh, 2010a, 2010b; Wright, 2005, 2008; Wright & Bell, 2009). Spirituality is often an underused resource in family nursing (see Chapter 27). Increasingly, families choose to explore the spiritual beliefs and practices that best fit their multifaceted lives, beliefs about spirituality, and relationships. Spiritual assessment and support will therefore be highly individualized within an inquiry-oriented approach (Hartrick Doane & Varcoe, 2006; Walsh, 2010a).

Questions to Ask the Family

- What spiritual practices does your family have? What priority do these practices hold in your family? Have your family's spiritual beliefs changed or been challenged in any way during this illness?
- Are you involved in a particular church, temple, mosque, synagogue, group, religious, or spiritual community?
- Would you discuss a family problem with anyone from your place of worship?
- Do you consider your spiritual beliefs a resource? A source of stress?

Environment. The family *environment* refers to the larger community, neighbourhood, and home. Environmental factors that may affect family functioning include availability or lack of adequate space and of access to schools, day care, recreation, and public transportation.

Questions to Ask the Family

- What are the advantages and disadvantages of living in your neighbourhood?
- What community services does your family use?
- What community services would you like to learn about?

Structural Assessment Tools. The CFAM encourages you to work with family members to create genograms and ecomaps to facilitate documentation and understanding

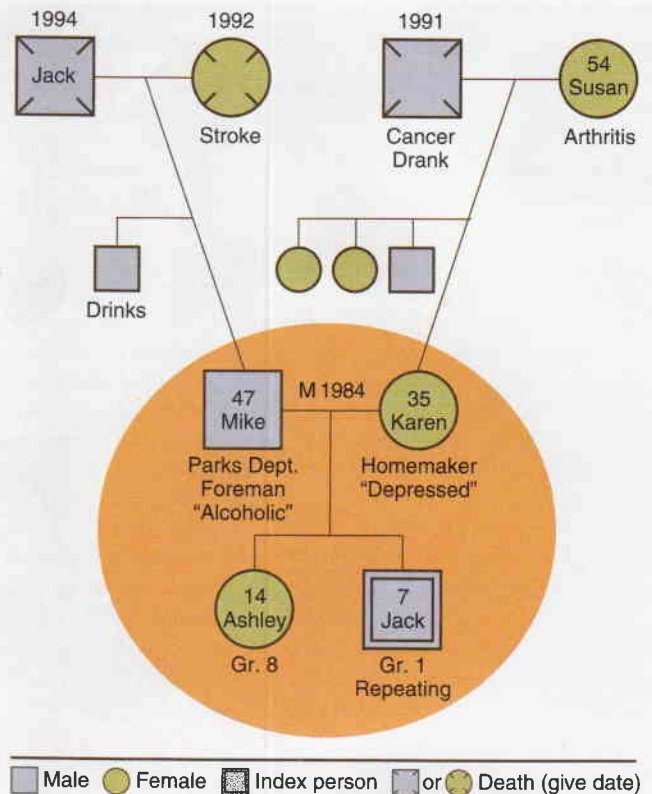


Figure 19-3 Sample family genogram. **Source:** Adapted from Wright, L. M., & Leahey, M. (2009). *Nurses and families: A guide to family assessment and intervention* (5th ed., p. 75, Figure 3-4). Philadelphia, PA: F. A. Davis.

of the family structure and its contact with outside individuals and organizations. A **genogram** is a sketch of the family structure and relevant information about family members (Figure 19-3). Some agencies have genogram forms, but genograms can also be sketched on other forms, such as admission forms and records. The genogram becomes part of the documentation about the patient and family. An **ecomap** is a sketch of the family's relationships with persons and groups outside the family (Figure 19-4). The family members who share the household are depicted in the centre of the ecomap, and various important extended family members or larger systems are sketched in to show their relationship to the family.

Nurses are encouraged to draw genograms and ecomaps for families with whom they will be involved for more than one day. Information for brief genograms and ecomaps can be gleaned from family members during the initial assessment of the family structure. The most essential information for genograms includes data about ages, occupation or schooling, religion, ethnicity, and current health status of family members. For a brief genogram, focus only on information relevant to the family and the health problem. The shared creation of a genogram by a nurse and family can be an important time for the nurse to engage with the family, forming a relational connection between family members and the nurse. Engagement can be facilitated through the use of humour, curiosity, and invitations for family members to describe the strengths they see in one another. For example, the nurse might ask a child (eight years old), "What do you most like about your dad?"

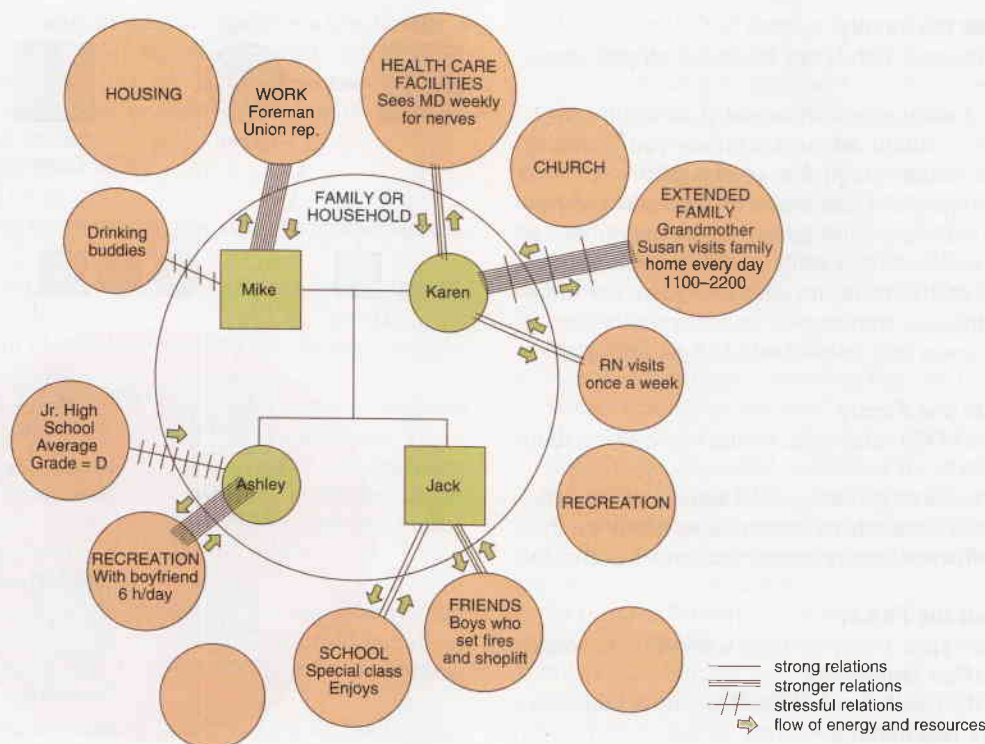


Figure 19-4 A sample family ecomap. RN, registered nurse. **Source:** Adapted from Wright, L. M., & Leahey, M. (2009). *Nurses and families: A guide to family assessment and intervention* (5th ed., p. 84, Figure 3-10). Philadelphia, PA: F. A. Davis.

Developmental Assessment

Families, like individuals, change and grow over time. Although each family is unique, all families tend to go through certain stages that require family members to adjust, adapt, and change roles. Each developmental stage presents challenges and includes tasks that need to be completed before the family can successfully move on to the next stage. Family development is more than the concurrent development of children and adults. It is the interaction between an individual's development and the phase of the family developmental life cycle that can be significant for family functioning. Therefore, in addition to understanding family structure, nurses need to understand the developmental life cycle of each family.

In their articulation of the expanded family life cycle, McGoldrick and colleagues (2011) described the emotional process of life cycle transition, as well as the family development tasks for different stages. The family life cycle stages described include: "Leaving Home: Emerging Young Adults, Joining of Families Through Marriage Union, Families with Young Children, Families with Adolescents, Launching Children and Moving on at Midlife, Families in Late Middle Age, and Families Nearing the End of Life" (pp. 16-17). Additionally, the unique challenges faced by single parent, lesbian, gay, bisexual, and transgender families, as well as those facing transitions related to divorce, are discussed. Understanding family development theory can help nurses to promote health during expected family life cycle transitions and experiences of illness. For further information, please see *The Expanded Family Life Cycle: Individual, Family, and Social Perspectives* (4th edition) (McGoldrick et al. (2011).

Functional Assessment

A *functional assessment* focuses on how family members interact and behave toward each other. Nurses assess family

functioning by closely observing the interactions of family members in two subcategories: instrumental and expressive functioning.

Instrumental Functioning. *Instrumental functioning* refers to the normal activities of daily living such as preparing meals, eating, sleeping, and attending to health needs. For families with health problems, these activities often become a challenge. Roles may change as family members cope with a relative's illness and disability. Within the context of illness, nurses and other health care providers play an important role in accessing practical and financial resources to support family members' instrumental needs (i.e., financial resources for medical supplies that parents need to care for an ill child at home).

Questions to Ask the Family

- Who is usually responsible for housekeeping and child care?
- Do other family members help with these tasks?
- Does anyone in the family require help with activities of daily living?
- Who will be primarily responsible for flushing Mary's broviac line (an intravenous access device for the administration of medications and blood tests) when she is discharged home?

Expressive Functioning. *Expressive functioning* refers to the ways in which people communicate. The significance of communication within the family cannot be emphasized enough, for it has a profound impact on a family's adjustment to illness, and their resiliency in the face of developmental and illness related challenges. Illness and disability often challenge and alter expressive functioning within the family. A diagnosis may cause intense feelings of anxiety or grief, both within the person being diagnosed and within other family members. Nurses should encourage families to explore their

understanding of illness and how it affects their lives. Nurses may need to assist family with these difficult conversations, given the emotional intensity of this communication (Box 19-7). There are ten subcategories of expressive functioning: emotional, verbal, nonverbal, and circular communication; problem solving; roles; influence; beliefs; and alliances and coalitions.

Emotional Communication. Emotional communication encompasses the range and types of feelings that are expressed by the family. Most families express a wide range of feelings. Families with problems may have rigid patterns and narrower ranges of emotional expression (e.g., a family coping with a father's cancer diagnosis may be anxious and unable to express optimism or hope for the future). Family roles and gender may affect emotional expression. For example, brothers and sisters who have a sibling with a life-threatening illness may not express their own experiences of suffering because they want to protect their family from further distress and worry (Woodgate, 2006).

Questions to Ask the Family

- How can you tell when each member of your family is happy, sad, or under stress?
- How do you express happiness, sadness, or stress?
- Johnny, when you are sad or worried, who in the family do you most like to spend time with or talk to about that?

Verbal Communication. Nurses should observe a family's verbal communication, focusing on the meaning of the words in terms of the relationship. Is communication among family members clear and direct, or is it vague and indirect? Ask family members about how well the family communicates

Questions to Ask the Family

- Which family member communicates most clearly?
- How might your family members communicate with each other more effectively?
- Families sometimes find it helpful to talk with one of the nurses about their life at home after learning about the illness. Do you think your family would find that helpful?

Nonverbal Communication. Nonverbal communication consists of messages conveyed without words, including body language, eye contact, gesturing, crying, and tone of voice.

Questions to Ask the Family

- How do you think your daughter feels when your son rolls his eyes while she's talking?
- Who shows the most distress when talking about your dad's drinking? What are some of the nonverbal signals that indicate your daughter is distressed when talking about her dad's drinking?

Circular Communication. Circular communication refers to reciprocal communication between family members; that is, each person influences the behaviour of the other. Circular communication can be adaptive or maladaptive. For example, an adaptive communication pattern occurs when a parent comforts a child when the child cries. Because the parent responds to the child, the child feels safe and secure. An example of a maladaptive communication pattern is when a parent criticizes a teenager for not phoning home. The teenager is angry for being criticized and avoids the parent, and then the parent becomes angrier and criticizes more.

Questions to Ask the Family

- You mentioned that your teenager does not phone home. What do you do then?
- What do you think your daughter is thinking when you criticize her?

BOX 19-7 RESEARCH HIGHLIGHT

Research Focus: Therapeutic Conversations With Family Members Experiencing Childhood Cancer



Research Abstract

Children with cancer and their families experience physical, emotional, spiritual, and relational illness distress. Families have described the sadness and fear they live with and the difficulty experienced in talking about cancer. Despite calls for comprehensive psychosocial intervention, childhood cancer research that examines family intervention has been limited. West (2011) recently conducted a qualitative study that analyzed videotaped therapeutic conversations from the Family Nursing Unit, University of Calgary, as well as research interviews with family members (19) and nurse clinicians (3) following their participation in a Family Systems Nursing clinical intervention. The therapeutic conversations were guided by the Illness Beliefs Model (Wright & Bell, 2009). The research questions explored the internalized questions that parents, ill children, brothers, and sisters ask themselves while living with childhood cancer, and how nurses could better attend to their suffering. The research approach used was philosophical hermeneutics (Gadamer, 1989). Nursing interventions that were found to lessen illness suffering included bringing the family and nurse together for the purpose of a therapeutic conversation and creating a therapeutic space where illness suffering was brought forward through the sharing of illness experiences with the nurse, as well as other family members. West (2011) found that when nurses invited family members into a reflective, listening stance, they were assisted to hear each other's illness experiences, which facilitated new interpretations of their suffering. Integral to this intervention process was the nurse's presence, described as a "holding" or "containing" of suffering, giving family members the experience of being heard, and opening families to new interpretations of their suffering through the offering of alternative illness beliefs. Questions and nursing responses that invited family members to externalize their internalized questions and dialogue were particularly helpful in lessening suffering. Sharing commendations with family members was also another valuable nursing intervention that helped to enhance family strengths and lessen experiences of suffering.

An interview excerpt with Lizzie (14-year-old sister, research participant) highlights the profound importance of family nursing practices:

Lizzie: Well see, when you're in the hospital with your children for six months, a year, or for the rest of their life, you get disconnected from all your other children. So if you have an opportunity to sit down with the whole family . . . with your children, and talk to someone about what's going on, and just open up and share . . . you should take it cause it would really show . . . what everyone is going through. Because even though you're at the hospital, your children at school or the house . . . you don't know what's happening. Like, at times, I cried myself to sleep at night and I could hear Jason [brother] in the other room and . . . there's just so much that goes on, that no one really knows. Like even my sister Rachael, even though she was always home, or we were gone, and we would come home . . . her eyes would just be bright red from crying, and you could see the tear going down her . . . so take a chance, or the opportunity to sit down with the whole family and talk. It would really help (Research Interview excerpted from West, 2011, p. 201).

Problem Solving. Problem solving refers to how a family thinks about actions to take to resolve difficult situations.

Questions to Ask the Family

- Who first notices problems? How does your family tend to deal with problems?
- Is one member more proactive than others about solving problems?

Roles. Roles are established patterns of behaviour for family members, often developed through interactions with others. Formal roles include those of mother, husband, friend, and so forth. Informal roles can include, for example, those of “the softy,” “the angel,” or “the scapegoat.” In the context of illness, family members often must take on new roles, such as medical caregiver.

Questions to Ask the Family

- Who is the “good listener” . . . who is “the angel” in your family?

Influence. Influence refers to methods of affecting or controlling another person’s behaviour. Influence may be instrumental (e.g., rewards for behaviour such as the promise of candy, computer time), psychological (communication to influence behaviour such as praise, admonishment), or corporal (the use of body contact such as hugging, hitting).

Questions to Ask the Family

- What method does your mom use to get you to go to bed on time?
- How does your grandma get your brother to attend school when he refuses?

Beliefs. Beliefs are individual- and family-held fundamental ideas, values, opinions, and assumptions (Wright et al., 1996). Understanding the core beliefs (Wright & Bell, 2009) of family members is central to understanding their suffering and to facilitating healing in the context of illness (Wright et al., 1996; Wright & Bell, 2009). Beliefs influence behaviour and how the family adapts to illness. For example, if a family believes that vaccinations may cause disabilities, the parents may decline vaccinating an infant.

Questions to Ask the Family

- What do you believe causes your husband’s depression?
- What do you believe would be the effect on your chronic pain if you chose to participate in that treatment?

Alliances and Coalitions. Alliances and coalitions involve the directionality, balance, and intensity of relationships among family members or between families and nurses.

Questions to Ask the Family

- If the children are playing well together, who would be most likely to get them to start fighting?
- Is there anything that you were hoping we would talk about today that we haven’t spoken about?

Family Intervention: The Calgary Family Intervention Model

After assessment, nurses intervene to help families meet their needs, face challenges, and appreciate their strengths. A range of family nursing interventions can be offered to families in the context of a therapeutic relationship. Some, such as parent education and caregiver support, are general; others are specific and require therapeutic communication and family interviewing skills. The ultimate goal is to help family members discover alternative solutions that may lessen or alleviate emotional, physical, and spiritual suffering. Whether caring for a patient with the family as context or directing care to the

family as patient, nursing interventions aim to enhance family members’ abilities in certain areas, to remove barriers to health care, and to perform actions that the family cannot perform for itself. Nurses guide the family in problem solving, provide practical services, and convey a sense of acceptance and caring by listening carefully to family members’ experiences, concerns, suggestions, and questions.

Interventions for each family must be individualized and focus on particular areas of family functioning (cognitive, affective, behavioural) (Wright & Leahey, 2009). You can only *offer* interventions and must not instruct or insist on a particular kind of change or way of family functioning. Nurses need to sensitively attend to ideas or interventions the family perceives as being most helpful (Wright & Leahey, 2009).

The **Calgary Family Intervention Model (CFIM)** is a companion to the CFAM and can be used as a guide for your intervention with the family (Wright & Leahey, 2009). The CFIM focuses on promoting and improving family functioning in three domains: cognitive, affective, and behavioural. Interventions may affect functioning in any or all of the three domains. For example, when a clinic nurse informs a wife that her husband, who has amyotrophic lateral sclerosis, is still capable of large gross motor movement, the nurse can suggest he help with chores in the house, such as bringing the laundry upstairs. This intervention challenges the wife’s thinking that her husband was incapable of work, influences her to feel less depressed over her husband’s declining physical capacity, and leads her to change her behaviour by including her husband when performing other household chores.

The CFIM recommends many relational nursing practices that promote family health and functioning, including asking interventive questions, offering commendations, providing information, validating emotional responses, encouraging illness narratives, supporting family caregivers, and encouraging respite. Central to this interventional practice is the nurse’s engagement with family members in a thoughtful, purposeful relation (Tapp, 2001) (Table 19-1). Within CFAM and CFIM, as well as in the Illness Beliefs Model (Wright & Bell, 2009; Wright et al., 1996), nurses are guided to continually attend to the cultivation of a relationship that is collaborative, responsive, and nonhierarchical. Within this relationship, there is a privileging of family expertise and a commitment to listening deeply to the concerns, suffering, and questions of family members.

The guidance provided by Hartrick Doane and Varcoe (2005) in their discussion of family nursing as relational inquiry can also be a helpful guide for your relational engagement with the families you encounter in your practice.

Asking Interventive Questions

One of the most effective ways that nurses can help families is by engaging in therapeutic conversations with families and asking them questions. Questions lead the family to reflect on their situation, clarify opinions and ideas, and understand how they are affected by their family member’s illness or condition. By hearing their own responses to questions, as well as the responses of others, family members can better understand themselves and each other and perhaps discover new possibilities for health and healing. Interventive questions also elicit information important to the nurse.

There are two types of interventive questions: linear and circular (Tomm, 1987, 1988). **Linear questions** elicit information about a patient or family. They explore a family member’s descriptions or perceptions of an illness or life challenge. For

► **TABLE 19-1 The ABCs of Engaging Families**

A	B	C
Assume an active, confident approach.	Begin by providing structure to the meeting (time frame, orientation to the context).	Create a context of mutual trust.
Ask purposeful questions that draw forth family assessment data.	Behave in a curious manner, and take an equal interest in all family members, whether present or not.	Clarify expectations about your role with the family.
Address all who are present, including small children.	Build on family strengths by offering commendations to the family.	Collaborate in decision making, health promotion, and health management.
Adjust the conversation to children's developmental stages.	Bring relevant resources to the meeting (list of agencies, phone numbers, pamphlets).	Cultivate a context of racial and ethnic sensitivity. Commend family members.

Source: Adapted from Levac, A. M. C., Wright, L. M., & Leahey, M. (2002). Children and families: Models for assessment and intervention. In J. A. Fox (Ed.), *Primary health care of infants, children, and adolescents* (2nd ed.; p. 111). St Louis, MO: Mosby.

example, linear questions may be used when exploring a couple's perceptions of their daughter's anorexia nervosa: "When did you notice that your daughter had changed her eating habits?" "Has she been hospitalized in the past for this problem?" These questions inform you of the daughter's eating patterns and illuminate family perceptions or beliefs about eating patterns.

Circular questions help determine possible changes for a patient's or family's life. They help you understand relationships between individuals, beliefs, and events and elicit valuable information to help create change. In this way, circular questions often help patients make new cognitive connections, paving the way for changes in family behaviours. For example, with the same family, you could ask, "Who is most worried about Cheyenne's anorexia?" or "How does Ellen show that she's worrying the most?" Although linear questions may imply that you know what is best for the family, circular questions facilitate change by inviting the family to discover their own answers. Linear questions tend to target specific yes or no answers, thereby limiting options for the family; for example, "Have you tried time out to discipline your three-year-old?" An alternative circular question might be "Which type of discipline seems to work best for your child?" Several types of circular questions exist; each can affect the cognitive, affective, and behavioural domains. These types include difference questions, behavioural effect questions, hypothetical or future-oriented questions, and triadic questions (Tomm, 1987, 1988; Wright & Leahey, 2009) (Table 19-2).

Offering Commendations

Families do not always view themselves as having inherent strength and resilience. You can help the family become aware

► **TABLE 19-2 Three Types of Circular Questions**

EXAMPLES TO ELICIT CHANGE

Purpose of Question	Cognitive Domain	Affective Domain	Behavioural Domain
Difference Question			
Explores differences between people, relationships, time, ideas, or beliefs	What is the best advice given you about supporting your son with AIDS? What is the worst advice?	Who in the family is most worried about how AIDS is transmitted?	Which family member is best at getting your son to take his medication on time?
Behavioural Effect Question			
Explores connections between how one family member's behaviour affects other members	What do you know about the effect of life-threatening illness on children?	How does your son show that he is afraid of dying?	What could you do to show your son that you understand his fears?
Hypothetical/Future-Oriented Question			
Explores family options and alternative actions or meanings in the future	What do you think will happen if these skin grafts continue to be painful for Dan?	If Dan's skin grafts are not successful, what do you think his mood will be? Angry? Resigned?	When will your son engage in treatment for his contractures?
Triadic Question			
Question posed to a third person about the relationship between two other people	If your father were not drinking daily, what would your mother think about his receiving treatment for alcoholism?	What does your father do that makes your mother less anxious about his condition?	If your father were willing to talk to your mother about solutions to his addiction, what do you think he might say?

Source: Adapted from Wright, L. M., & Leahey, M. (2009). *Nurses and families: A guide to family assessment and intervention* (5th ed., pp. 162–163). Philadelphia, PA: F. A. Davis.

of their unique strengths, thus increasing their potential and capabilities. A **commendation** is a conversational statement emphasizing family strengths and abilities. While spending time with the family, you may observe many instances in which the family displays strengths. It is important to acknowledge these with the family so that they can recognize and appreciate their capabilities. By commending a family's strengths and capacities, you can offer family members a new view of themselves, and this may invite a change in how they view their health challenges. Look for patterns of behaviour to commend, rather than a single occurrence. For example, you may say, "Your family has shown courage living with your wife's cancer for five years" or "I'm impressed with how the family worked together during the crisis." Families coping with chronic, life-threatening, or psychosocial problems frequently feel hopeless in their efforts to overcome or live with the illness. Therefore, you should offer as many truthful, genuine commendations as possible. In a qualitative research study exploring the practice of commendations, family members shared their belief that commendations were part of the "special, meaningful, and caring relationships that they developed with the therapists [nurses]. Commendations were not techniques . . . but a way of being with people in the world" (Houger Limacher, 2008, p. 99).

Family strengths include clear communication, adaptability, healthy boundaries, support and nurturing among family members, and the use of crisis for growth. You can help the family focus on these strengths rather than on weaknesses.

Providing Information

Families need information from health care providers about developmental issues, health promotion, and illness management, especially if the illness is complex (Hartrick Doane & Varcoe, 2005; Levac et al., 2002). Accurate, timely information is essential for the family to make decisions and cope with difficult situations. Health education is a process by which information is exchanged between nurse and patient/family. Family and patient needs for information may be elicited through direct questioning but are often far more subtle. In this role of educator, you may recognize, for example, that a new father is fearful of cleaning his newborn's umbilical cord stump or that an older woman is not using her cane safely. Respectful communication is required. Nurses often share information subtly: "I notice you are trying to not touch the umbilical cord stump; I see that a lot with other new parents" or "You use the cane the way I did before I was shown a way to keep from falling or tripping over it; do you mind if I show you?" When you assume a humble, caring position instead of coming across as an authority on the subject, this attitude often decreases the patient's defences and invites the family to listen without feeling embarrassed.

Validating or Normalizing Emotional Responses

Validating intense emotions can alleviate a family's feelings of isolation and loneliness and help family members make the connection between a family member's illness and their own emotional response. For example, after a diagnosis of a life-shortening illness, families frequently feel powerless or frightened. It is important to validate these strong emotions as normal and reassure families that they will adjust and learn new ways to cope. You may do this by sharing experiences you have had with other families who faced a similar situation.

Encouraging Illness Narratives

Too often, patients and family members are encouraged to talk only about the medical aspects of their illness rather than the emotional aspects. An **illness narrative** is the person's story of how the illness affects his or her whole being, including emotional, intellectual, social, and spiritual dimensions (Kleinman, 1988; Wright & Bell, 2009). Hearing the person's illness narrative will help you understand the person's/family's strengths and challenges, and the beliefs they hold about their illness experience. This information enables you to offer commendations to the family. Many people also find that telling their story helps them better understand themselves, their experience, and their family's experience. Families also benefit from listening to one another's illness narratives. Prior to meeting with their nurse, families may not have had the opportunity to hear and understand how other family members have suffered in living with illness (Boxes 19-7 and 19-8).

Communicating what it is like to live with individual, separate experiences, particularly the experience of illness, is a powerful human need (Nichols, 1995; Wright, 2005). Frequently, nurses believe that listening entails an obligation to "fix" whatever concerns or problems are raised. However, showing compassion through deep listening and offering commendations are usually more therapeutic or helpful than is offering solutions to problems (Bohn et al., 2003; Houger Limacher, 2003, 2008; Houger Limacher & Wright, 2003; Moules, 2002; Tapp, 2001; Wright & Bell, 2009).

Encouraging Family Support

Family functioning is enhanced by encouraging and assisting family members to listen to each other's concerns and feelings.

* BOX 19-8

EVIDENCE-INFORMED PRACTICE GUIDELINE

Lessons Learned From the Study of Therapeutic Conversations Between Nurses and Family Members Living with Childhood Cancer



- Nurses should offer families the opportunity to gather together in order to speak about the suffering they experience living with illness. Family members may be unable to speak directly with one another about intense emotions and illness suffering.
- The nurse's presence with family members for the purpose of a therapeutic conversation can facilitate a sharing and lessening of suffering. The nurse's ability to create a safe relational space where suffering is explored and contained or held by the nurse is particularly important.
- Careful relational engagement, eliciting the illness narrative, asking circular questions, offering commendations, as well as externalizing inner dialogue are particularly helpful interventions that may help to lessen suffering. The exploration of alternative illness beliefs within the therapeutic conversation opens possibilities for family healing and new ways of living with illness.
- When a family member shares their illness narrative with a nurse, other family members are able to adopt a listening, reflective stance allowing the family to listen and understand each other's experiences differently.

Reference: West, C. H. (2011). Addressing illness suffering in childhood cancer: Exploring the beliefs of family members in therapeutic nursing conversations (unpublished doctoral dissertation). University of Calgary, Calgary.

This assistance can be particularly useful if a family member is embracing some constraining beliefs when a loved one is dying or has died (RNAO, 2006; Wright & Nagy, 1993). For example, a family may believe that talking with the ill person about death and dying would hasten the person's death.

Supporting Family Caregivers

Family members are often afraid of becoming involved in the care of an ill member without a nurse's support. One way you can best provide care is through supporting family caregivers. Without preparation and support, caregiving can be stressful, causing a decline in the health of the caregiver and care receiver or the development of abusive relationships.

Despite its demands, caregiving, whether one spouse caring for the other or a child caring for a parent, can be a positive and rewarding experience (Duxbury et al., 2009). The interpersonal dynamics between family members influence the ultimate quality of caregiving. Nurses can play a key role in helping family members develop better communication and problem-solving skills needed for caregiving.

Researchers have identified variables, such as caregiver and care recipient expectations, that influence caregiving quality. Carruth (1996) studied the concept of **reciprocity**, in which care recipients acknowledged the importance of the caregiver's help, and contributions to a caregiver self-worth. When the caregiver knows that the care recipient appreciates his or her efforts and values the assistance provided, the caregiving relationship is healthier and more satisfying.

Encouraging Respite

Nurses should encourage respite for caregivers, who may feel guilty about or not even recognize their need to withdraw, even temporarily, from caregiving tasks. Sometimes an ill person may be encouraged to accept another person's temporary assistance so that family members can take a break. Whatever the situation, you should remember that each family's need for respite varies.

Providing care and support for family caregivers often involves using available family and community resources for respite. A caregiving schedule is useful when all family members participate, when extended family members share any financial burdens posed by caregiving, and when distant relatives send cards and letters communicating their support. However, it is important to understand the relationship between potential caregivers and care recipients. If the relationship is not a supportive one, community services may be a resource for both the patient and family.

Services that may be beneficial to families include caregiver respite, caregiver support groups, housing and transportation services, food and nutrition services, housecleaning, legal and financial services, home care, hospice, and mental health resources. Before referring a family to a community resource, it is crucial that you are aware of the community services themselves, understand the family's dynamics, and know whether such support is desired or welcomed. A family caregiver may resist help, feeling obligated to be the sole source of support to the care recipient. You must be sensitive to family relationships and help normalize the demands of caregiving and the need for respite.

Interviewing the Family

With a clear conceptual framework for assessment and intervention, you can begin to learn the competencies and skills

needed to conduct family interviews. Family interviews follow the same basic principles as any patient interview (see Chapter 12). However, family interviews have the complexity of more people and multiple relationships. You must develop keen perceptual, conceptual, and executive skills. *Perceptual skills* refer to the ability to make relevant observations. In family interviewing, the nurse must observe multiple interactions and relationships simultaneously. *Conceptual skills* constitute the ability to formulate observations of the entire family and give meaning to those observations. Remember that observations and subsequent judgements are subjective and not conclusive. Executive skills are the actual therapeutic interventions you offer in the context of a family interview. These therapeutic interventions elicit responses from family members and are the basis for further observations and conceptualizations. During an interview, observe and listen for responses from a patient and family to formulate further therapeutic interventions. The type of intervention that you offer depends on your clinical expertise and experience in working with families, as well as the unique challenges and strengths of the family members you are working with. The four stages of a family interview are engagement, assessment, intervention, and termination. Each of these stages will include specific perceptual and executive skills. For more information on the skills and stages of conducting a family interview, see *Nurses and Families: A Guide to Family Assessment and Intervention* (2009), written by Dr. Lorraine Wright and Dr. Maureen Leahey. With these skills, you can assess, explore, and identify strengths and problems in the familiar process of engagement, assessment, intervention, and termination (see Chapter 17). You can also decide to intervene or refer the family to another health provider. These skills should not necessarily be applied to all families. You should tailor the interview to each family's individual context.

It is important to realize that not all family interviews are formal, lengthy processes. Even if you do not have the time for a formal family interview, you can still engage the family in productive, therapeutic conversations. Every conversation between you and the patient or family members improves communication and understanding. Therapeutic conversations can be as short as one sentence or as long as time allows. All therapeutic conversations, regardless of time, have the potential to unite the family (Hougher Limacher & Wright, 2003; McLeod, 2003; West, 2011). Even brief interviews or conversations have tremendous healing potential because they offer families the opportunity to acknowledge and affirm their problems and seek solutions (Hougher Limacher, 2003; Moules, 2002; Tapp, 2001; Wright & Bell, 2009; Wright & Leahey, 2009).

The integration of task-oriented patient care with interactive, purposeful conversation distinguishes a time-effective interview (taking less than 15 minutes). Providing information and involving the family in decision making are integral parts of the therapeutic process. You should search for opportunities to engage in purposeful conversations with families, which may include the following:

- Routinely inviting families to accompany the patient to the unit, clinic, or hospital
- Routinely including families' participation in the admission procedure
- Routinely inviting families to ask questions
- Acknowledging the patient and family's expertise in managing the health problem at home
- Routinely consulting patients and families about their ideas regarding treatment and discharge

✦ KEY CONCEPTS

- Family members influence one another's health beliefs, practices, and status.
- The concept of family is highly individual; thus, you should base care on the patient's definition of family rather than on an inflexible definition of family.
- Family nursing care requires that nurses continually examine the current trends in the Canadian family and its health care implications.
- A healthy, resilient family is able to integrate the need for stability with the need for growth and change. The family can be viewed as context, in which you focus either on the individual patient within the context of his or her family or on the family with the individual as context, or the family can be viewed as patient (family systems nursing), in which you focus on family interactions.
- The CFAM is a conceptual framework that guides you in assessing the structural, developmental, and functional aspects of the family.
- Genograms and ecomaps are structural assessment tools that provide a pictorial image of the family's structure and relation to outside influences.
- Family members as caregivers are often spouses who may be either older adults themselves or adult children trying to work full-time, care for aging parents, and enable children to move out of the home (launch children) successfully.
- Illness and disability often alter expressive functioning and communication within the family.
- Family nursing as relational inquiry is concerned with understanding the family in context (interpersonal, social, geopolitical, historical, environmental context).
- A number of relational capacities that support being in relation with families in a mode of inquiry that balances letting be and emancipator action are key components to family nursing as relational inquiry.
- The CFIM is a companion to the CFAM that guides you in implementing family interventions; it is focused on improving family functioning in three domains: cognitive (thinking), affective (feeling), and behavioural (doing).
- One of the simplest and most effective ways that you can help families is by asking them interventive questions.
- Offering commendations is important because they encourage the family to recognize their strengths and competencies.
- Other nursing interventions to help the family include providing information, validating emotional responses, encouraging patients to provide illness narratives, supporting family caregivers, and encouraging respite for family caregivers.
- Family caregiving is an interactional process that occurs within the context of the relationships among its members.
- Family interviews require you to have perceptual, conceptual, and executive skills; interviews may be formal and lengthy or casual and brief.

✦ CRITICAL THINKING EXERCISES

1. Kathy is a palliative care nurse working with a family of four: Wai-Ling, a 45-year-old single mother; her adolescent sons, Chun and Wang; and Heng, her 76-year-old mother, who is in the last stages of terminal breast cancer. The family has lived together for ten years, ever since they immigrated to Canada from Hong Kong. Heng helped Wai-Ling parent Chun and Wang and supported Wai-Ling when her husband died five

years ago. Wai-Ling has decided to care for her mother in the family's home until Heng dies. Kathy will assist this family in achieving their goal. Kathy has just had in-service training in using CFAM.

- a. What parts of the CFAM should Kathy use when assessing the family's needs?
 - b. How can Kathy help the family achieve their goal of caring for their aging family member at home?
 - c. How can Kathy determine this family's strengths, suffering, and resources?
 - d. What cultural aspects are important to consider for a family who has immigrated to Canada and is now facing the death of a loved one?
 - e. What self-awareness and reflection will support a relational inquiry approach to the assessment and interventions?
2. Dan and Kim divorced seven years ago, and neither has remarried. They have three daughters, aged 10, 12, and 14. At the time of the divorce, Dan was HIV-positive, and has remained so for five years. Kim has had repeated tests and remains HIV-negative. Dan is responding to therapy slowly. Kim and Dan share parenting responsibilities and have a friendly relationship. They have decided it would be easier for the family to live together again so that Dan can actively participate in his children's lives without placing caregiver demands on Kim when the extended family visits overnight. Kim also wants to care for her former husband.
 - a. What family development tasks are important to assess for this family as the members attempt to reunite?
 - b. How should the nurse determine what support services the family needs?
 - c. What assessment questions would be useful to ask in order to assess how the illness is affecting this family? Do family members have any signs of emotional, physical, or spiritual suffering?
 3. Mr. and Mrs. Baillarger, both in their early 50s, are the youngest members of large families. They work full-time and have two teenage children. Both sets of their parents are in their 80s and have chronic health problems. All of their siblings live farther away.
 - a. How can the nurse help Mr. and Mrs. Baillarger access resources to aid in caring for their parents and maintain the responsibilities of their own family unit?
 - b. What developmental tasks does this family have?
 - c. What kinds of questions can you ask to assess the family's emotional and verbal communication (found in CFAM's functional assessment category)?

✦ REVIEW QUESTIONS

1. The nurse must think of family as
 1. Parents and their children
 2. People related by marriage, birth, or adoption
 3. The nuclear family and aunts, uncles, grandparents, and cousins
 4. A set of relationships that the patient identifies as family
2. The patient is remarried, and her two children from a previous marriage live in the same household. Her husband's children visit on the weekend. This is an example of
 1. A nuclear family
 2. A blended family
 3. An extended family
 4. An alternative family

3. Which of the following is *not* a current trend?
 1. The proportion of couples without children at home is increasing.
 2. The proportion of "traditional" families is declining.
 3. The proportions of common-law and lone-parent families are increasing.
 4. The proportion of teenagers giving birth has increased steadily.
4. The primary social context in which health promotion and disease prevention take place is
 1. At educational institutions
 2. From friends and colleagues
 3. From physicians and nurses
 4. In the family
5. Two factors that contribute to the long-term health of a family are
 1. Structure and function
 2. Caregiving and reciprocity
 3. Hardiness and resiliency
 4. Context and system
6. When nurses view the family as patient, their primary focus is on the
 1. Health and development of an individual member existing within a specific environment
 2. Family process and relationships
 3. Family relational and transactional concepts
 4. Family within a system
7. Asking a patient "Who is in your family?" helps you assess
 1. Internal structure
 2. External structure
 3. Context
 4. Instrumental functioning
8. Approaching family from a relational inquiry perspective has a goal of
 1. Professional collaboration
 2. Systematic problem solving
 3. Inquiry to understand the family in context
 4. Circular questions
9. Two of the components of relational inquiry include
 1. Using both open- and closed-ended questions
 2. Applying both a strict assessment format and corresponding interventions
 3. Incorporating both letting be and emancipatory action
 4. Assessing the presenting problem and history of the presenting problem
10. According to the CFAM, emotional communication is a sub-category of
 1. Instrumental functioning
 2. Development
 3. Internal structure
 4. Expressive functioning

11. "What do you think when your husband won't visit your son in the hospital?" is an example of a circular question. Asking the family circular questions is an effective way to
 1. Facilitate change by inviting the family to discover their own answers
 2. Encourage family members to be caregivers
 3. Validate their emotional responses
 4. Target specific yes or no answers
12. During a family interview, the nurse can
 1. Educate the family
 2. Enforce change
 3. Engage a family to assess, explore, and identify strengths and problems
 4. Establish roles

✦ RECOMMENDED WEB SITES

The Vanier Institute of the Family: <http://www.vanierinstitute.ca>

The Vanier Institute of the Family aims to "create awareness of, and to provide leadership on, the importance and strengths of families in Canada and the challenges they face in their structural, demographic, economic, cultural and social diversity" (Vanier Institute, About Us, paragraph 1). This Web site highlights news articles, research, publications, policies, and networks that focus on the family.

Institute of Marriage and the Family: *Transforming the Way Canadians Think About the Family*: <http://www.imfcanada.org/>

The Institute of Marriage and Family Canada (IMFC) "conducts, compiles and presents the latest and most accurate research to ensure that marriage and family-friendly policy are foremost in the minds of Canada's decision makers" (IMFC, 2012, About us, paragraph 2). Policy, research, and educational resources related to the family can be found on their Web site.

International Family Nursing Association: <http://internationalfamilynursing.org/wordpress/>

Journal of Family Nursing: <http://jfn.sagepub.com>

The Journal of Family Nursing (JFN) "is a peer-reviewed, quarterly journal of nursing research, practice, education, and policy issues, as well as empirical and theoretical analyses on the subject of family health. Its interdisciplinary, international, and collaborative perspectives examine cultural diversity and families across the life cycle" (Sage Journals, 2012, paragraph 1).

Family Nursing Resources: <http://www.familynursingresources.com>

Family Nursing videos, books, DVDs, and family genographs are available on this Web site.

Lorraine M. Wright: <http://www.lorrainewright.com>

Janice Bell: <http://www.janicebell.com>

Review Question Answers

1. 4; 2. 2; 3. 4; 4. 4; 5. 3; 6. 2; 7. 1; 8. 3; 9. 3; 10. 4; 11. 1; 12. 3

Rationales for the Review Questions appear at the end of the book.

Patient Education

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objectives

Mastery of content in this chapter will enable you to:

- Define the key terms listed.
- Identify appropriate topics for a patient's health education.
- Identify the role of the nurse in patient education.
- Identify the purposes of patient education.
- Use communication principles when providing patient education.
- Describe the domains of learning.
- Identify basic learning needs.
- Identify factors that influence the learning experience.
- Differentiate factors that determine readiness to learn from those that determine the ability to learn.
- Compare and contrast the nursing and teaching processes.
- Write learning objectives for a teaching plan.
- Establish an environment that promotes learning.
- Include patient teaching while performing routine nursing care.
- Use appropriate methods to evaluate learning.

key terms

- | | |
|-----------------------------|--------------------------------|
| Affective learning, p. 294 | Psychomotor learning, p. 294 |
| Analogies, p. 304 | Reinforcement, p. 302 |
| Cognitive learning, p. 293 | Return demonstration, p. 304 |
| Health literacy, p. 304 | Social learning theory, p. 296 |
| Learning, p. 293 | Teaching, p. 292 |
| Learning objectives, p. 297 | |
| Motivation, p. 296 | |

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Patient education is one of the most important roles for nurses in any health care setting. Patients and family members have the right to health education so that they can make informed decisions about their health care and lifestyle. Shorter hospital stays, increased demands on nurses' time, increase in numbers of patients with acute conditions, the severity of these acute conditions, and the increase in numbers of chronically ill patients emphasize the importance of high-quality patient education. Initial patient education often takes place in the hospital while patients are in the highly stressful acute stage of their illness and may not be completed at the time of discharge. Hospitals need to have clear guidelines to provide for follow-up. Patient education helps ensure continuity of care as patients move from one health care setting to another. Nurses often clarify information provided by physicians and other health care providers and may become the primary source of information for people adjusting to health problems (Kiger, 2004). In primary health care settings, nurses are often the main source of information about health promotion and illness prevention (Box 20-1).

► BOX 20-1

Supporting Patients With Chronic Disease Through Education

The incidence of chronic disease is increasing with the growing older adult population. Management of chronic illness, such as chronic obstructive pulmonary disease (COPD), includes a significant primary health component, focusing on the promotion of optimal health. Patient education can positively influence health behaviour, minimize symptoms, and assist patients to maintain optimal health.

Nurse-led clinics can educate patients about their disease, its consequences, and its management. The goal of patient education is to support patients in lifestyle changes and is aimed at maintaining and where possible improving their health. It is a tool necessary for effective patient self-care. Education in primary health care is not limited to providing facts and information. It also addresses the emotional component of chronic illness and acknowledges feeling and affective reactions to being chronically ill. Taking a patient-centred care approach, the patient is a partner in the education process. This requires developing a professional therapeutic relationship to enable the patient to improve his or her knowledge, acquire skills, and adapt behaviours as a means to “restore, maintain and improve their health” (Zakrisson & Hägglund, 2010, p. 148).

By using a motivational model such as the Transtheoretical Model (TMM), the nurse can engage the patient through an individual process of lifestyle change. The nurse acknowledges that patients may not be ready to change some aspects of their lives, despite health risks. Activities focus on motivating and enabling the patient through the stages of change and providing stage-appropriate educational material. This respects the patient's autonomy and focuses efforts to where they are most likely to be successful. Acknowledging the patients' ownership of their behaviour and taking a motivational approach to behaviour change promotes the patients' self-efficacy, and as a result success is more likely. Success with lifestyle change in one area may increase readiness in other areas.

From Zakrisson, A., & Hägglund, D. (2010). The asthma/COPD nurses' experience of educating patients with chronic obstructive pulmonary disease in primary health care. *Scandinavian Journal of Caring Sciences*, 24(1), 147–155. doi:10.1111/j.1471-6712.2009.00698.x.

The general public has become more assertive in seeking knowledge, understanding health, and finding resources available within the health care system. Nurses need to assist patients in navigating the vast amount of information available to them, through all forms of media. The Internet and other forms of technology (telehealth, e-health) provide nurses and patients with vast amounts of information, some reliable and some not. Patients need guidance regarding the selection of current and reliable resources. Nurses must be able to discuss with patients the criteria for evaluating sources for validity and reliability. The teaching material provided by nurses must honour the copyright rules and must reference both written information and illustrations that are used to support patient learning.

You need to be mindful of the increasing emphasis on “scientific” evidence and the diminished focus on other kinds of evidence of the efficacy or effectiveness of therapeutic interventions. You need to have a broad perspective of what constitutes meaningful evidence to support the significance of testimonials, lived experiences, and other ways of knowing. Because critical thinking is essential in nursing care, you need to be mindful that knowledge is limited, beliefs change, and conclusions are temporary. A well-designed, comprehensive

teaching plan that meets a learner's needs can reduce health care costs, improve quality of care, help patients gain optimal wellness, and increase independence (Bastable, 2006).

Goals of Patient Education

The goal of patient education is to assist individuals, families, or communities in achieving optimal health (Edelman & Mandle, 2010). Education is an important component of primary health care; it helps individuals, families, and communities to develop the knowledge, understanding, and skills necessary to maintain and improve their health; reduces hardship; helps contain health care costs; and enables people to take control of their own health (Hogan, 2008; World Health Organization [WHO], 1986). Patient education has three main goals (Box 20-2):

- Maintaining and promoting health and preventing illness
- Restoring health
- Optimizing quality of life with impaired functioning

Maintaining and Promoting Health and Preventing Illness

In the home, clinic, or other community health care setting, you provide information and skills that people need to maintain and improve their health (see Box 20-2). For example, in prenatal classes, nurses teach expectant parents about fetal development and physical and psychological changes during pregnancy. They also teach about the importance of healthy food choices, exercise, and avoiding substances that might harm the fetus. Greater knowledge can result in better health. When patients become more health conscious, they are more likely to seek early diagnosis of health problems (Redman, 2007). The growth and development of the Internet has allowed health information and resources to be accessed directly by patients.

Restoring Health

Many patients seek information and skills that will help them regain or maintain their health (see Box 20-2). However, patients who find it difficult to adapt to illness may be more passive. You will learn to identify barriers to learning, to recognize patients' willingness to learn, and to help motivate interest in learning (Redman, 2007).

The family can be a vital part of a patient's return to health and may need to know as much as the patient. If you exclude the family from a teaching plan, conflicts may arise. For example, if the family does not understand a patient's need to regain independent function, their efforts may encourage dependency and slow recovery. You should assess the patient-family relationship before involving the family in a teaching plan (see Chapter 19).

Coping With Impaired Functioning

Some patients must learn to cope with permanent health alterations. For example, a patient who loses the ability to speak after surgery of the larynx must learn new ways to communicate. A patient with severe heart disease must learn to modify risk factors that might cause further heart damage. After the patient's needs are identified and the family has displayed willingness to help, you teach family members to assist the patient with health care management (e.g., giving medications through gastric tubes and performing passive range-of-motion exercises).

► BOX 20-2 Topics for Health Education**Health Maintenance and Promotion and Illness Prevention****Educate patients about:**

First aid
 Health resources (e.g., Internet)
 Avoidance of risk factors (e.g., smoking, alcoholism, obesity)
 Stress management
 Typical growth and development patterns
 Proper hygiene
 Immunizations (e.g., recommendations, risks and benefits)
 Prenatal care and normal child-bearing
 Nutrition
 Exercise
 Safety (in home and health care setting)
 Screening for common conditions (e.g., blood pressure, poor vision, cholesterol level)
 Behaviour modification to change risky behaviours (e.g., smoking cessation, treatment for substance abuse)

Restoration of Health**Educate patients about:**

Patient's disease or condition
 Anatomy and physiology of body system affected by disease or condition
 Cause of disease
 Origin of symptoms
 Expected effects on other body systems
 Prognosis
 Limitations on function
 Rationale for treatment
 Medications
 Alternative therapies (evidence regarding risks and benefits)
 Tests and therapies
 Nursing measures
 Surgical intervention
 Expected duration of care
 Hospital or clinic environment
 Hospital or clinic staff
 Long-term care implications
 Methods for patient's participation in care
 Limitations imposed by disease or surgery

Optimizing Quality of Life When Functions Are Impaired**Educate patients about:**

Home care
 Medications
 Intravenous therapy
 Diet
 Activity
 Self-help devices
 Rehabilitation of remaining function
 Allied health services (e.g., physiotherapy, occupational therapy, speech therapy)
 Prevention of complications
 Knowledge of risk factors
 Implications of noncompliance with therapy
 Environmental alterations
 Self-help and support groups

*** BOX 20-3 RESEARCH HIGHLIGHT****The Effectiveness of Nurse-Directed Patient Education****Research Focus**

Patients living with venous leg ulcers need education about their diagnosis and related care to prevent multiple hospitalizations and promote optimal functioning.

Research Abstract

Kapp and colleagues (2010) wanted to know if a Leg Ulcer Prevention Program (LUPP), a multidisciplinary approach to patient education about the prevention and management of venous leg ulcers, was effective. LUPP provided an innovative approach to educating patients about venous leg ulcers and ulcer prevention and treatment. The program consisted of six weekly sessions in the patient's home by a visiting nurse. Each session consisted of a short computerized multimedia presentation, a written version of the presentation, and a summary sheet of the main message and activities relevant to the session content. Following completion of the six sessions, patients were found to be more knowledgeable about the cause of venous ulcers and how to prevent and treat leg ulcers. Health behaviours that were improved following the sessions included increase in walking and recommended exercises, elevation of legs when sitting, and improved skin care. Nutrition considerations such as diet and fluids intake were not influenced by the sessions. The proper use of compression therapy was also improved following the program. Patients indicated they found the sessions informative and valuable and appreciated the multiple methods of information delivery with support from the nurse.

Research Highlights

- A multimethod approach enhanced patients' understanding and health behaviours relating to the prevention and management of venous leg ulcers.
- Use of compression therapy improved following education sessions.
- The use of multiple methods of information delivery was effective with onsite nurse support.

Reference: Kapp, S., Miller, C., Sayers, V., & Donahue, L. (2010). The Leg Ulcer Prevention Program: Effectiveness of a multimedia patient education package for people with venous leg ulcers. *Wound and Practice Research*, 18(2), 80–90. Retrieved from EBSCOhost.

**Teaching and Learning**

Teaching is an interactive process that promotes learning. Teaching and learning generally begin when a person identifies a need for knowing or acquiring an ability to do something. A nurse-teacher provides information that prompts the patient to engage in activities that lead to a desired change (Box 20-3). Teaching is most effective when it addresses the learner's needs, learning style, and capacity. The teacher assesses these needs by asking questions, observing the patient, and determining the patient's interests. With successful teaching, patients can learn new skills or change existing attitudes (Redman, 2007).

Role of the Nurse in Teaching and Learning

Nurses have an ethical responsibility to teach their patients about health enhancement (Redman, 2005, 2007). The

Canadian Nurses Association's (2008) *Code of Ethics* indicates that patients have the right to make informed decisions about their care. The information that patients need to make such decisions must be accurate, complete, and relevant to their needs. You should anticipate patients' needs for information on the basis of their overall condition (physical, mental, emotional, spiritual), identified risks, and interdisciplinary treatment plans. Nurses often clarify information provided by physicians and other health care providers and may become the primary source of information for adjusting to health problems (Bastable, 2006).

Patients and their families often ask nurses for health information. It is easy to identify the need for teaching when patients request information. However, in some cases, the need for information may be less apparent. You must observe and listen carefully to determine patients' needs for information and learning. When you value education and ensure that your patients learn necessary information, patients are better prepared to assume health care responsibilities. To be an effective educator, you must do more than just pass on facts; you must determine what patients need to know, find time when they are ready to learn, and evaluate the impact of patient education on patient outcomes (Bastable, 2006, 2008; Redman, 2007).

Teaching as Communication

Effective teaching depends on effective communication (see Chapter 17). To be a good teacher, you must listen empathetically, observe astutely, and speak clearly. Many intrapersonal variables—including attitudes, values, culture, emotions, and knowledge—influence both the nurse's and patient's styles and approaches. Both you and the patient are also affected by the patient's motivation and ability to learn, which depend on physical and psychological health, education, developmental stage, and previous knowledge.

Domains of Learning

Learning occurs in three domains: cognitive (understanding), affective (attitudes), and psychomotor (motor skills); (Anderson & Krathwohl, 2001; Bloom, 1956). Any topic to be learned may involve one domain, all domains, or any combination of the three. For example, patients with diabetes must learn how diabetes affects the body and how to control blood glucose levels for better health (cognitive domain). They must also learn to accept the chronic nature of diabetes by learning positive coping mechanisms (affective domain). Finally, many patients with diabetes must learn to test their blood glucose levels at home. This requires learning how to use a glucose meter (psychomotor domain). By understanding each learning domain, you can select appropriate teaching methods (Box 20-4).

Cognitive Learning

Cognitive learning includes all intellectual behaviours and requires thinking (Anderson & Krathwohl, 2001). In the hierarchy of cognitive behaviours, the simplest behaviour is remembering, whereas the most complex is creating. Cognitive learning includes the following:

- Remembering: the ability to retrieve knowledge from long-term memory
- Understanding: the ability to construct the meaning of learned material

► BOX 20-4

Appropriate Teaching Methods Based on Domains of Learning

Cognitive

Discussion (One-on-One or Group)

May involve nurse and one patient or nurse with several patients
Promotes active participation and focuses on topics of interest to patient

Facilitates peer support

Enhances application and analysis of new information

Storytelling

Can involve individual or group

Facilitates cultural relevance and safety

Enhances application of new information to a familiar context

Lecture

Is more formal method of instruction because it is teacher controlled

Helps learner acquire new knowledge and gain comprehension

Question-and-Answer Session

Is designed specifically to address patient's concerns

Assists patient in applying knowledge

Role Play and Discovery

Encourages patient to actively apply knowledge in controlled situation

Promotes synthesis of information and problem solving

Independent Projects (e.g., Computer-Assisted Instruction) and Field Experience

Assists patient to assume responsibility for learning at own pace

Promotes analysis, synthesis, and evaluation of new information and skills

Affective

Role Play

Encourages expression of values, feelings, and attitudes

Discussion (Group)

Enables patient to acquire support from other people in group

Encourages patient to learn from other people's experiences

Promotes responding, valuing, and organizing

Discussion (One-on-One)

Facilitates discussion of personal, sensitive topics of interest or concern

Psychomotor

Demonstration

Provides presentation of procedures or skills by nurse

Encourages patient to model nurse's behaviour

Allows nurse to control questioning during demonstration

Practice

Enables patient to perform skills by using equipment in a controlled setting

Allows repetition

Return Demonstrations

Enables patient to perform skill as nurse observes

Provides excellent source of feedback and reinforcement

Independent Projects and Games

Require teaching method that promotes adaptation and initiation of psychomotor learning

Enable learner to use new skills

- Applying: the use of abstract, newly learned ideas in a practical situation
- Analyzing: the breaking down of information into organized parts and determining how the parts relate to one and other
- Evaluating: making judgements based on criteria and standards
- Creating: combining elements to form a coherent and functional whole

Affective Learning

Affective learning concerns expressions of feelings and acceptance of attitudes, opinions, or values. Values clarification (see Chapter 7) is an example of affective learning. The simplest behaviour in the affective learning hierarchy is receiving, and the most complex is characterizing (Krathwohl et al., 1964).

- Receiving: the willingness to attend to another person's words
- Responding: active participation through listening and reacting verbally and nonverbally
- Valuing: attachment of worth to an object, concept, or behaviour, demonstrated by the learner's actions
- Organizing: development of a value system by identifying and organizing values and resolving conflicts
- Characterizing: action and response with a consistent value system

Psychomotor Learning

Psychomotor learning involves acquiring skills that require the integration of mental and muscular activity, such as the ability to walk or to use an eating utensil. The simplest behaviour in the hierarchy is perception and the most complex is origination (Rankin & Stallings, 2005; Redman, 2007).

- Perception: awareness of objects or qualities through the use of sense organs
- Set: a readiness (mental, physical, or emotional) to take a particular action
- Guided response: the performance of an act under the guidance of an instructor, involving imitation of a demonstrated act
- Mechanism: a higher level of behaviour by which a person gains confidence and skill in performing a behaviour that is more complex or involves several more steps than does a guided response
- Complex overt response: the smooth and accurate performance of a motor skill that requires a complex movement pattern
- Adaptation: the ability to change motor response when unexpected problems occur
- Origination: use of existing psychomotor skills and abilities to perform a highly complex motor act that involves creating new movement patterns

Basic Learning Principles

Before nurses can teach, they must understand how people learn. Learning depends on the learning environment and on the individual's ability to learn, learning style, and motivation to learn. Learning takes place both in formal learning sessions, which involve planned learning activities, and in teachable moments, which allow you to spontaneously take advantage of teaching opportunities as they occur in the day-to-day contact with the patient.

Learning Environment

Patient education takes place in a variety of settings: the patient's home, community centres, classrooms, and hospital rooms. The ideal environment for learning is a well-lit, well-ventilated room with appropriate furniture and a comfortable temperature. A quiet setting with few distractions and interruptions helps concentration. You can provide privacy even in a busy hospital by closing cubicle curtains or taking the patient to a quiet spot. In the home, a bedroom might separate the patient from household activities. If the patient desires, family members or significant others may share in discussions. However, some patients may be reluctant to discuss their illness when other people, even close family members, are in the room. An ideal environment is not always achievable, however, and rather than miss a teachable moment, you can adapt the environment as much as possible to provide privacy and minimize distractions.

Ability to Learn

The ability to learn depends on emotional, intellectual, and physical capabilities and on developmental stage. If a patient's learning ability is impaired, you should modify or postpone teaching activities.

Emotional Capability. Emotions can aid or prevent learning. Mild anxiety may help a person focus. However, stronger levels of anxiety can be incapacitating, creating an inability to attend to anything other than to relieve the anxiety. The prospect of change makes many people anxious. Seriously ill people, who are faced with multiple losses, may be extremely anxious and distressed. Nurses must be sensitive to a patient's level of anxiety. If a person is incapacitated by anxiety, you need to find a way to alleviate the anxiety. This may mean teaching relaxation techniques before attempting to teach a task or a procedure.

Intellectual Capability. Patients have different levels of intellectual ability. You must assess the patient's knowledge and intellectual level before beginning a teaching plan. For example, measuring liquid or solid food portions requires the ability to perform mathematical calculations. Reading a medication label or discharge instructions requires reading and comprehension skills. Following directions when performing self-care in accordance with limitations requires comprehension and application skills.

Physical Capability. The ability to learn often depends on physical health. To learn psychomotor skills, a patient must possess the necessary strength, coordination, and sensory acuity. You should not overestimate the patient's physical ability. The following physical attributes are necessary for learning psychomotor skills:

- Size (height and weight adequate for performing the task or using the equipment, such as crutch walking)
- Strength (ability of the patient to follow a strenuous exercise program)
- Coordination (dexterity needed for complicated motor skills, such as using utensils, changing a bandage, or opening a medication container)
- Sensory acuity (visual, auditory, tactile, gustatory, and olfactory resources needed to receive and respond to messages taught)

Any physical condition (e.g., pain, fatigue, hunger) that depletes energy also impairs the ability to learn. For example, a patient in a weakened state who has just spent hours undergoing diagnostic tests is likely to be too fatigued to learn.

► BOX 20-5

Teaching Methods Based on Patient's Developmental Capacity

Infant

Maintain consistent routines (e.g., feeding, bathing).
Hold infant firmly while smiling and speaking softly, to convey sense of trust.
Have infant touch different textures (e.g., soft fabric, hard plastic).

Toddler

Use play to teach procedure or activity (e.g., handling examination equipment, applying bandage to doll).
Offer picture books that describe a story of children in a hospital or clinic.
Use simple words such as "cut" instead of "laceration," to promote understanding.

Preschooler

Use role playing, imitation, and play to make learning fun.
Encourage questions and offer explanations; use simple explanations and demonstrations.
Encourage several children to learn together through pictures and short stories about how to perform hygiene.

School-Age Child

Teach necessary psychomotor skills. (Complicated skills, such as learning to use a syringe, may take considerable practice.)
Offer opportunities to discuss health problems and answer questions.

Adolescent

Help adolescent learn about feelings and need for self-expression.
Collaborate with adolescent on teaching activities.
Let adolescent make decisions about health and health promotion (safety, sex education, substance abuse).
Use problem solving to help adolescent make choices.

Young or Middle-Age Adult

Encourage participation in teaching plan by setting mutual goals.
Encourage independent learning.
Offer information so that adult can understand effects of health problem.

Older Adult

Teach when patient is alert and rested.
Involve adult in discussion or activity.
Focus on wellness and the person's strength.
Use approaches that enhance sensorially impaired patient's reception of stimuli (see Chapter 47).
Keep teaching sessions short.

Nurses must assess the patient's energy level by noting the patient's willingness to communicate, the degree of activity initiated, and the patient's responsiveness to questions. You may halt teaching if the patient needs rest.

Developmental Stage. Age and stage of development affect the ability to learn (Box 20-5). Without proper biological, motor, language, and personal-social development, many types of learning cannot take place.

Learning in Children. As a child matures, intellectual growth progresses from concrete to abstract. Therefore, information should be understandable, and the expected outcomes should be realistic and based on the child's developmental



Figure 20-1 The nurse uses a developmentally appropriate toy syringe to teach about immunization to the school-aged children.

stage. Developmentally appropriate teaching aids should also be used (Figure 20-1).

Adult Learning. Many adults are independent, self-directed learners. However, they may become dependent in new learning situations. Adults typically learn more successfully when they are encouraged to use past experiences to solve problems. Adult patients and nurses should collaborate on educational topics and goals. Needs or issues that are important to the adult should be addressed early in the teaching-learning process. Ultimately, adults must accept responsibility for changing their own behaviours. Assessing what the adult patient currently knows, teaching what the patient wants to know, and setting mutual goals will improve the outcomes of care and education (Bastable, 2008).

Learning Style and Preference

People have different learning styles. Everyone processes information differently by seeing and hearing, reflecting and acting, reasoning logically and intuitively, and analyzing and visualizing. Some people are visual learners; they learn best by watching. Audiovisual presentations and visual demonstrations often work best for this type of learner. Other people are kinesthetic learners; they learn best when they are able to manipulate tools and find out how they work. Some people learn by taking detailed notes; others prefer to only listen. Some people need to be engaged in activities and discussion in order to learn effectively. Others may be too shy to enjoy this type of learning and prefer to learn from an orderly, structured presentation.

Environmental, social, emotional, psychological, and physical stimuli affect people differently. Some people prefer complete silence in the learning environment, whereas others prefer background sounds. Some prefer to learn in a group; others, on their own. Different people prefer different times of the day for learning experiences.

When developing teaching plans, you should assess the favoured learning style and preferences of the patient. With groups, it may not be possible to address every patient's preferences. However, including a combination of approaches to meet multiple learning styles can ensure that most people's learning preferences are met (Bastable, 2006). When the patient

is having difficulty with learning, you should consider a change to accommodate a different learning style.

Motivation to Learn

Motivation is a person's desire or willingness to learn, and it influences a person's behaviour (Redman, 2007; Box 20-6). If a person is not ready or does not want to learn, learning is unlikely to occur. The stimuli for motivation vary between

individuals and may be social, task mastery, or physical in nature. *Social motives* reflect a need for connection, social approval, or self-esteem. For example, the motivation to exercise may be linked to the social aspects of the exercise activities (Heading, 2008). *Task mastery motives* are driven by desire for achievement. For example, a high school student with diabetes begins to test blood glucose levels and determine insulin dosages before leaving home and establishing independence. The desire to live independently and manage the disease provides the motivation to master the task or skill. After succeeding at a task, a person is usually motivated to achieve more. *Physical motives* come from a desire to maintain and improve health. Patients motivated by the need to survive or overcome hardship are often more motivated than those who wish merely to improve their health (Rankin & Stallings, 2005). For example, a patient who has undergone a leg amputation may be extremely motivated to learn to use assistive devices, whereas a patient who is overweight but otherwise healthy may not be motivated to exercise.

Many people do not adopt new health behaviours or change unhealthy behaviours unless they perceive a disease as a threat, overcome barriers to changing health practices, and see the benefits of such changes (Pender et al., 2011). Thus, a patient with lung disease may continue to smoke. An obese patient may worsen a heart condition by refusing to follow a low-fat diet.

Motivation and Social Learning Theory. Health education often involves changing people's attitudes and values. Change can occur only when education plans and interventions are based on sound learning theories. A number of theories address the complex patient education process (Bastable, 2008; Redman, 2007). One of these is **social learning theory**, which helps educators understand learners and develop interventions that enhance motivation and learning (Bandura, 2001; Bastable, 2008; Wood, 2008).

When people believe that they can execute a particular behaviour, they are more likely to perform the behaviour consistently and correctly (Bandura, 1997). *Self-efficacy*, a social learning theory concept, is a person's perceived ability to successfully complete a task. Beliefs about self-efficacy arise from four sources: verbal persuasion, vicarious experiences, enactive mastery experiences, and physiological and affective states (Bandura, 1997). Understanding these sources lets nurses develop appropriate interventions. For example, a nurse teaching a boy with asthma to use an inhaler expresses positive reinforcement (verbal persuasion), by encouraging him to use the inhaler himself. The nurse then demonstrates to the boy how to use the inhaler (vicarious experience). The boy successfully uses the inhaler by himself (enactive mastery experience). As the boy is able to control his asthma by using the inhaler, the nurse gives him positive feedback, which further enhances his confidence to use the inhaler (physiological and affective states). Interventions such as these enhance perceived self-efficacy, which in turn improves the achievement of desired outcomes.

Motivation and Transtheoretical Model of Change.

Health education may involve changes in behaviour. Behavioural change is often challenging and difficult. It involves a process that occurs over time through a series of stages. By identifying the patient's stage of change and focusing learning activities to match the patient's stage, you facilitate the learner's motivation to change and his or her transition from one stage to the next. Five stages have been identified and used in

BOX 20-6 NURSING STORY

"To Take or Not to Take"

In preparation for a trip to Vietnam and Cambodia, Mr. and Mrs. Bennet visited a travel clinic, which recommended that they update their immunization (diphtheria-pertussis-tetanus, hepatitis A, typhoid) and take antimalarial drugs for the Cambodia portion of the trip (atovaquone/proguanil [Malarone], one pill daily starting one day before stay and continuing during stay and one week after). When they came in for their immunizations, they expressed some concerns about taking the antimalarial drugs. They had been talking to friends who told them these antimalarial drugs had severe side effects and caused hallucinations. They had investigated several Internet sites that their friends had recommended; these sites indicated that antimalarial drugs were not required for where they were going. Mrs. Bennet e-mailed the Cambodian Consulate in Canada and was told that malaria was not a concern where they were going.

Assessment

- Concerned about health but received mixed messages about the need for antimalarial drugs
- Concerned about serious side effects of drugs
- Motivated to learn

Plan

- Discussed with Mr. and Mrs. Bennet criteria evaluating Web sites for health information (author, age, conflict of interest, whether evidence informed rather than opinion based)
- Provided list of reliable travel health sites (Health Canada, World Health Organization, US Centers for Disease Control and Prevention)
- Identified other measures to reduce risk of contracting malaria (using mosquito repellent, limiting time outside at night, staying in air-conditioned rooms or mosquito nets, wearing protective clothing)
- Discussed various drugs used for malaria and the incidence and type of side effects
- Explored the risk of not taking medication and implications of contracting malaria
- Identified other resources of information (travel agents, pharmacists)

Outcome

Mr. and Mrs. Bennet visited several reliable sources on the Internet and talked to their pharmacist. They identified several strategies to minimize exposure to mosquitoes on their travels. Mr. Bennet learned that the risk of side effects from the Malarone was minimal and decided to take the drug. Mrs. Bennet also recognized that the risk for side effects was minimal; however, because of her concern about those side effects, she decided not to take the Malarone. She was more comfortable taking the risk because she understood that if she developed a high fever and flu-like illness at any time up to a year after the trip, she had to seek immediate medical attention.

smoking cessation activities (Prochaska & DiClemente, 1992; Stephenson & Allen, 2007):

- Precontemplation: is unaware of need for change and has no intention of changing behaviour
- Contemplation: is aware of need for change and intends to change behaviour sometime in the future
- Preparation: alters behaviour in minor ways with the intention to make substantive changes in the immediate future
- Action: modifies behaviour and experiences in order to make sustainable change
- Maintenance: focuses on not reverting to previous behaviour and on solidifying new behaviours

Integrating the Nursing and Teaching Processes

The nursing and teaching processes are related (Redman, 2007) and usually take place concurrently. Like the nursing process, the teaching process requires assessment, nursing diagnosis, planning, implementation, and evaluation. However, the processes are not exactly the same: the nursing process is broader. For example, determining a patient's health needs requires assessing all data sources. The teaching process is focused on data sources that reveal the patient's learning needs, willingness and ability to learn, and available teaching resources. The teaching process is especially useful for teaching large groups, where individual learning needs and styles may vary. Table 20-1 compares the teaching and nursing processes.

The teaching process requires assessment. The patient's ability to learn, motivation, and needs should be assessed and analyzed. A diagnostic statement specifies the information or skills that the patient requires. You set specific **learning objectives** (i.e., what the learner will be able to do after successful instruction) and implement the teaching plan by using teaching and learning principles to ensure that the patient acquires knowledge and skills. Finally, the teaching process requires an evaluation of learning; this evaluation is based on learning objectives.

❖ Assessment

During assessment, you determine the patient's health care needs (see Chapter 12). The patient may reveal a need for health care information, or you may identify a need for education. Learning needs identified by both the patient and the nurse determine the content to be learned. By performing an effective assessment, you can individualize instruction for each patient (Polzein, 2007). Ask specific questions to assess a patient's unique learning needs (Box 20-7).

Learning Needs

Most patients can identify at least some of their own learning needs. Effective questioning and assessment tools help you determine a patient's perceived learning needs. By listening carefully and using open-ended and closed-ended questions (see Chapter 17), nurses can often find out what a patient's needs are. Because a patient's health status is dynamic, assessment is an ongoing activity. Assess the following:

- Information or skills needed by the patient to perform self-care and to understand the implications of a health problem. (Health care team members anticipate learning needs related to specific health problems. For example, you teach an adolescent boy to perform testicular self-examination.)

► TABLE 20-1

Comparison of the Nursing and Teaching Processes

Basic Steps	Nursing Process	Teaching Process
Assessment	Collect data about patient's physical, psychological, social, cultural, developmental, and spiritual needs from patient, family, diagnostic tests, medical record, health history, learning style, and literature.	Gather data about patient's learning needs, motivation, ability to learn, and teaching resources from patient, family, learning environment, medical record, health history, and literature.
Nursing diagnosis	Identify appropriate nursing diagnoses based on assessment findings, including deficits.	Identify patient's learning needs on basis of three domains of learning.
Planning	Develop individualized care plan. Set diagnosis priorities on the basis of patient's immediate needs. Collaborate with patient on care plan.	Establish learning objectives, stated in behavioural terms. Identify priorities regarding learning needs. Collaborate with patient on teaching plan. Identify type of teaching method to use.
Implementation	Perform nursing care therapies. Include patient as active participant in care. Involve family or significant other in care as appropriate.	Implement teaching methods. Actively involve patient in learning activities. Include family or significant other in participation as appropriate.
Evaluation	Identify success in meeting desired outcomes and goals of nursing care. Alter interventions as indicated when goals are not met.	Determine outcomes of teaching-learning process. Measure patient's ability to achieve learning objectives. Reinforce information as needed.

- Patient's experiences that influence the need to learn.
- Information that the family members or significant others require to support the patient's needs. (The amount of information needed depends on the extent of the family's role in helping the patient.)

► BOX 20-7 Nursing Assessment Questions**Ask Patients**

What do you want to know?
 What do you know about your illness and your treatment plan?
 How does (or will) your illness affect your current lifestyle?
 What barriers currently exist that are preventing you from managing your illness the way you would like to manage it?
 What cultural or spiritual beliefs do you have regarding your illness and the prescribed treatment?
 What experiences have you had that are similar to what you are experiencing now?
 Together we can choose the best way for you to learn about your disease. How can I best help you?
 What role do you believe your health care provider should take in helping you manage your illness or maintain health?
 When you learn new information, do you prefer to have the information given to you in pictures or written down in words?
 When you give someone directions to your house, do you tell the person how to get there, write out the instructions, or draw a map?
 How involved do you want your family to be in the management of your illness?

Ask Family Members

When are you available to help, and how do you plan to help your loved one?
 Your spouse needs some help. How do you feel about learning how to assist him [her]?

Ability to Learn

The ability to learn can be impaired by many factors, including body temperature, electrolyte levels, oxygenation status, and blood glucose level. Several factors may influence a patient at one time. You assess the patient's ability to learn by considering the following:

- Physical strength, movement, dexterity, and coordination (you determine the patient's ability to perform skills)
- Sensory deficits that may affect the ability to understand or follow instruction (see Chapter 47)
- Reading level (reading level can be difficult to assess because functional illiteracy is often easy to conceal; one way to assess a patient's reading level and level of understanding is to ask the patient to read instructions from a teaching brochure and then explain its meaning)
- Developmental level (developmental level influences teaching approaches [see Box 20-5])
- Cognitive function (cognitive function includes memory, knowledge, association, and judgement)

Motivation to Learn

You ask questions that identify a patient's motivation level, which help you determine whether the patient is prepared and willing to learn. You assess the patient's motivation by studying the following:

- Behaviour (e.g., attention span, tendency to ask questions, memory, and ability to concentrate during the teaching session)
- Health beliefs and perception of a health problem and the benefits and barriers to treatment (e.g., you ask a patient with coronary artery disease, "Explain how heart disease

will affect you over time. What is the value of eating a low-fat diet?")

- Perceived ability to complete a required healthy behaviour
- Desire to learn
- Attitudes about health care providers (e.g., role of patient and nurse in making decisions, such as your asking, "In what way can I best help you?")
- Knowledge of information to be learned (the patient must play an active role in seeking health-related information)
- Pain, fatigue, anxiety, or other physical symptoms that can interfere with the ability to maintain attention and participate (in acute care settings, a patient's physical condition can easily detract from learning)
- Sociocultural background (a patient's beliefs and values about health and various therapies may be influenced by sociocultural norms or tradition [see Chapter 9]; educational efforts can be especially challenging when patients and educators do not speak the same language)
- Learning style preference (patients who learn better by seeing and hearing may benefit from a video; patients who learn best by reasoning logically and intuitively may learn better if presented with written material that they can analyze and discuss with others)

Teaching Environment

You assess the following factors when choosing a teaching environment:

- Distractions or persistent noise (a quiet area should be set aside for teaching)
- Comfort of the room, including ventilation, temperature, lighting, and furniture
- Room facilities and available equipment

Resources for Learning

Assessment of resources includes a review of available teaching tools. If a patient requires family support, you evaluate the readiness and ability of family and friends to learn to care for the patient, and you review resources in the home. You assess the following:

- Patient's willingness to have family members involved in the teaching plan and care (information about the patient's health care is confidential unless the patient chooses to share it)
- Family members' perceptions and understanding of the patient's illness and its implications (family members and patients' perceptions should match; otherwise, conflicts may arise in the teaching plan)
- Family's willingness and ability to participate in care (family members must be responsible, willing, and able to assist in care activities, such as bathing or administering medications)
- Resources in the home (these resources include health care equipment, access to technology, and a suitable rearrangement of rooms)
- Teaching tools, including brochures, audiovisual materials, or posters. Printed material should present current and easy-to-understand information that matches the patient's reading level.

❖ Nursing Diagnosis

After assessing the patient's ability and need to learn, you interpret data to form an accurate diagnosis. This diagnosis

ensures that teaching will be goal directed and individualized. If a patient has several learning needs, the nursing diagnoses guide priority setting. By classifying diagnoses according to the three learning domains, you can focus on subject matter and teaching methods. Examples of nursing diagnoses that indicate a need for education include the following:

- *Ineffective health maintenance*
- *Health-seeking behaviours*
- *Impaired home maintenance*
- *Deficient knowledge*
- *Ineffective therapeutic regimen management*
- *Ineffective community therapeutic regimen management*
- *Ineffective family therapeutic regimen management*

When health care problems can be managed through education, the diagnostic statement is *deficient knowledge*. For example, an older adult may be unable to manage a medication regimen because of the number of medications that must be taken at different times of the day. Education may improve the patient's ability to schedule and take the medications.

Some nursing diagnoses also indicate that teaching is inappropriate. You may identify conditions that hinder learning (e.g., nursing diagnosis of pain or activity intolerance). In these cases, you should delay teaching until the nursing diagnosis is resolved or the health problem is controlled.

❖ Planning

After identifying a patient's learning needs and making a nursing diagnosis, you develop a teaching plan, set goals and expected outcomes, and work with the patient to select a teaching method (Box 20-8). Expected outcomes or learning objectives determine which teaching strategies and approaches are appropriate. Patient participation is essential.

Developing Learning Objectives

Learning objectives identify the expected outcome of instruction and establish learning priorities. Objectives help you manage time and resources.

Objectives are either for a short term or a long term. Short-term objectives meet the patient's immediate learning needs, such as needing knowledge about an upcoming test. Long-term objectives, which are often broader, help a patient adapt to a long-term challenge. Learning objectives, which will guide the teaching plan, include the same criteria as outcomes in a nursing care plan:

- Singular behaviours
- Observable or measurable content
- Timing or conditions under which the objective is measured
- Goals mutually set by the nurse and patient

Each objective focuses on a single behaviour that will determine the patient's ability to meet health care outcomes. A behavioural objective contains an active verb, describing what the learner will do after the objective is met (e.g., "*will administer an injection*"). Behavioural objectives are measurable and observable and indicate how learning will be evidenced (e.g., "*will perform three-point crutch gait*"). The objective describes precise behaviours and content. Nurses should avoid vague or nonspecific objectives that do not explain what the learner is to do.

An objective is more precise when it describes the conditions or timing under which the behaviour occurs. Conditions

and time frames should be realistic and designed for the learner's needs (e.g., "*will identify the side effects of medication by discharge*"). It also helps to consider conditions under which the patient or family will perform the behaviour (e.g., "*will walk from bedroom to bathroom, using crutches*"). You set criteria for acceptable performance on the basis of the desired level of accuracy, success, or satisfaction. For example, "*a patient undergoing therapy for a fractured leg will walk on crutches to the end of the hall within three days.*" Criteria are more acceptable when the teacher and learner establish them mutually. However, you serve as a resource in setting the minimum criteria for success.

After formulating objectives, you and the patient establish a teaching plan. You integrate basic teaching principles and develop a well-timed, organized teaching plan.

Setting Priorities

The teaching plan is prioritized according to the patient's immediate needs, nursing diagnoses, learning objectives, main concerns, anxiety level, and the time available to teach.

Timing

When is the right time to teach? Before a patient is hospitalized? When a patient enters a clinic or a long-term care facility? At discharge? At home? All of these times are correct because patients continue to have learning needs and opportunities as long as they stay in the health care system. You should plan to teach when a patient is most attentive, receptive, and alert. However, timing can be difficult, particularly in an acute care setting, because the focus is on an early discharge. By the time the patient is ready to learn, discharge may already be scheduled. Therefore, you need to anticipate a patient's educational needs.

The length of teaching sessions also influences learning. Concentration decreases with prolonged sessions. You should assess a patient's level of concentration by observing nonverbal cues such as poor eye contact or slumped posture. Teaching sessions should be held often enough to document the patient's learning progress. The frequency of sessions depends on the learner's abilities and the complexity of the material. For example, a child in whom diabetes has been newly diagnosed will require more visits to an outpatient centre than will an older adult who has been managing diabetes for 15 years. Intervals between teaching sessions should not be so long that the patient might forget information.

Organizing Teaching Material

An outline helps organize information into a logical sequence. Material should progress from simple to complex. A person must learn simple facts and concepts before learning associations or complex concepts.

Essential content should be taught first because people are more likely to remember information that is taught early. Repetition reinforces learning. Summarizing key points helps the learner remember important information (Bastable, 2008).

Maintaining Attention and Promoting Participation

Active participation is key to learning. People learn better when more than one of the body's senses is stimulated. Nurses should engage the patients' interest by changing the tone and intensity of their voice, making eye contact, using gestures, asking questions, and encouraging participation with activities such as role playing.

► BOX 20-8 NURSING CARE PLAN

Learning Needs

Assessment

Connie, a nurse in a surgeon's office, is preparing Mr. Holland for a colon resection, which is scheduled in one week. Mr. Holland, aged

75, has recently received a diagnosis of colorectal cancer. Connie's assessment focuses on Mr. Holland's readiness to learn, available resources, and factors that might affect his ability to understand the procedure and related postoperative care.

Assessment Activities

Assess Mr. Holland's readiness to learn, and ask what the surgeon has already told him about the surgery.

Findings and Defining Characteristics

Mr. Holland responds, "I can't remember what the doctor told me at my last appointment. My surgery is scheduled for next week."

Ask Mr. Holland to explain postoperative care, including performing a return demonstration of deep breathing and coughing.

Mr. Holland is unable to describe postoperative care or provide a return demonstration of deep breathing and coughing.

Assess Mr. Holland's visual acuity.

Mr. Holland says he has difficulty reading small print.

Nursing Diagnosis: Deficient knowledge related to lack of recall and exposure to information

Planning

Goal (Nursing Outcomes Classification)*

Mr. Holland will describe preoperative and postoperative care to nurse before surgery.

Expected Outcomes*

Knowledge of Treatment Procedures

Mr. Holland will verbalize understanding of surgical procedure and related care on the day of surgery.

Mr. Holland will participate in postoperative care during hospitalization.

Mr. Holland will demonstrate deep breathing and coughing; he will advance his level of activity after his surgery.

*Outcome labels from Moorhead, S., Johnson, M., Maas, M. L., & Swanson, E. (Eds.). (2008). *Nursing outcomes classification (NOC)* (4th ed.). St Louis, MO: Mosby.

Interventions (Nursing Interventions Classification)[†]

Learning Readiness Enhancement

Determine readiness to learn and what the patient perceives as important to know.

Rationale

Adult patients' learning is enhanced when they are ready to learn and the information is perceived as important (Bastable, 2008).

Learning Facilitation

Give patient large-print brochure describing preoperative and postoperative care during educational session.

Providing patients with educational methods that use multiple senses is effective in educating older adults. Large fonts with contrasting colours are easier for older adults to visualize (Chubaty et al., 2009).

Provide patient with Internet address associated with clinic to access patient information and instructional video clips.

Explain postoperative care, demonstrate deep breathing and coughing, and have patient perform return demonstration.

Improving self-efficacy by using role modelling and by having the patient perform behaviours enhances the successful adoption of healthy behaviours (Bandura, 1997).

[†]Intervention classification labels from Bulechek, G. M., Butcher, H. K., & Dochterman, J. M., (Eds.). (2008). *Nursing interventions classification (NIC)* (5th ed.). St Louis, MO: Mosby.

Evaluation

Nursing Actions

Ask Mr. Holland what he can expect before and after surgery.

Patient Response and Finding

Mr. Holland is able to state understanding of preoperative and postoperative care.

Achievement of Outcome

Mr. Holland's anxiety level has decreased, and he reports that he is ready for surgery.

Observe patient as he demonstrates deep breathing and coughing and advances his activity postoperatively.

Mr. Holland is able to cough and breathe deeply postoperatively, but he is hesitant to advance his activity level after surgery.

Outcome of advancing activity postoperatively has not been totally achieved. Address and manage barriers inhibiting attainment of this outcome (e.g., pain), and continue to encourage and educate patient.

Building on Existing Knowledge

An effective teacher presents information that builds on a learner's existing knowledge. For example, a patient who has had multiple sclerosis must begin a new medication that is given subcutaneously. On assessment, you ask the patient

about experience with injections. The patient explains that she gave her father insulin injections for many years. You then individualize the teaching plan by building on the patient's previous knowledge and experience with insulin injections.

Selecting Teaching Methods

A teaching method is the way that the teacher delivers information. It is based on the patient's learning needs. More than one method may be used for instruction. For example, a patient who learns best in the psychomotor domain will benefit from demonstrations and supervised practice. The patient masters skills by manipulating equipment and practising manual skills. Discussions, question-and-answer sessions, and formal lectures can all be effective methods, depending on the patient's needs and learning style. When choosing appropriate teaching methods, you should encourage the patient to offer suggestions (Box 20-9).

Selecting Resources

You are responsible for ensuring that patients' educational needs are met. Sometimes patients' needs are highly complex.

BOX 20-9 PATIENT TEACHING

Teaching Strategies

- Establish trust with the patient before beginning the teaching-learning session.
- Limit teaching objectives.
- Use simple terminology to enhance the patient's understanding.
- Avoid medical jargon. If necessary, explain medical terms by using basic one- or two-syllable words.
- Schedule short teaching sessions at frequent intervals; minimize distractions during teaching sessions.
- Begin and end each teaching session with the most important information.
- Present information slowly, pacing to provide ample time for the patient to understand the material.
- Repeat important information.
- Provide many examples that have meaning to the patient; for example, relate new material to a previous life experience.
- Build on existing knowledge.
- Use visual cues and simple analogies when appropriate.
- Ask the patient for frequent feedback to determine whether the patient comprehends information.
- Demonstrate procedures such as measuring dosages; ask for return demonstrations (which provide opportunities to clarify instructions and time to review procedures).
- Provide teaching materials that reflect the reading level of the patient; use material that is written with short words and sentences, large type, and simple format (in general, information written on a Grade 5 reading level is recommended for adult learners).
- Provide teaching materials that reflect health literacy of the patient; use material that avoids jargon, acronyms, and unnecessary medical terminology and defines medical terms that are necessary.
- Model appropriate behaviour and use role playing to help patient learn how to ask questions and ask for help effectively.
- Pace the delivery of material so that patients can progress at their own speed.
- Include family members or other caregivers in the education process.



In these cases, you identify appropriate health education resources within the health care system or the community. Examples of resources for patient education are diabetes education clinics, cardiac rehabilitation programs, prenatal classes, and support groups. You obtain a referral if necessary, encourage patients to attend these sessions, and reinforce information taught.

Writing Teaching Plans

In all health care settings, nurses develop written teaching plans for use by colleagues. The nurse responsible for developing the teaching plan incorporates all pertinent information into the plan, including topics for instruction, resources (e.g., equipment, teaching booklets, and referrals to education programs), recommendations for involving family, and objectives of the teaching plan. A plan may be detailed or in outline form.

In an acute care setting, plans are concise and focused on the primary learning needs of the patient because time for teaching is limited. A home care teaching plan or outpatient clinic plan may be more comprehensive because nurses may have more time to instruct patients, and patients are often less anxious in outpatient settings.

A plan should provide continuity of instruction, particularly when several nurses are involved in a patient's care. The more specific the plan is, the easier it is to follow.

Implementation

Implementing a teaching plan depends on your ability to analyze assessment data when identifying learning needs and developing the teaching plan (see Box 20-8). You evaluate the learning objectives and determine the best teaching and learning methods to help the patient to meet expected goals and outcomes. You use a diversified approach to create an active learning environment (Box 20-10).

Teaching Approaches

A teaching approach is different from a method. Because a learner's needs and motives can change over time, you must be ready to modify teaching approaches.

Telling. The telling approach is useful when limited information must be taught (e.g., preparing a patient for an emergency diagnostic procedure). You outline the task to be done and the patient's role and give instructions—for example, explaining the insertion of an IV and the need for the patient to remain still. This method provides no opportunity for feedback.

Selling. The selling approach entails two-way communication. You pace instruction according to the patient's response. Specific feedback is given to the patient who learns successfully. For example, when the patient learns a step-by-step procedure for changing a dressing, first the patient learns to remove the old dressing, then to clean the wound, and finally to apply a new dressing.

Participating. Participating involves setting objectives and becoming involved in the learning process together. The patient helps decide content, and you guide and counsel the patient with pertinent information. Opportunities are provided for discussion, feedback, mutual goal setting, and revision of the teaching plan. For example, a patient's request for information about improving physical fitness leads to a discussion with the patient in which you identify key areas of interest, such as weight loss and improving cardiovascular fitness.

Data from Bastable, S. (2008). *Nurse as educator: Principles of teaching and learning for nursing practice*. Sudbury, MA: Jones & Bartlett; Lowenstein, A. J., Foord-May, L., & Romano, J. C. (Eds.). (2009). *Teaching strategies for health education and health promotion: Working with patients, families and communities*. Sudbury, MA: Jones & Bartlett.

► BOX 20-10

**Example of Nursing Interventions
Based on Patient's Learning Needs****Assessment Data**

Mr. Kennedy, aged 67, has a 15-year history of type 2 diabetes. He is in the hospital because of an infected foot ulcer that necessitates frequent dressing changes. Mr. Kennedy used to take oral hypoglycemic agents to control his blood glucose levels. However, he now needs to start home insulin injections because of the infection and wound. He must also learn how to change his dressings. Mr. Kennedy is anxious about his discharge and requests information about a local diabetes support group and Internet resources. The case manager indicates that Mr. Kennedy will be discharged soon.

Cognitive Interventions

- Ask Mr. Kennedy about what he believes he needs to know before his discharge.
- Encourage Mr. Kennedy to help establish learning outcomes and goals.
- Provide Mr. Kennedy with teaching materials regarding insulin preparation, administration, and how to recognize and manage hypoglycemia and hyperglycemia.
- During teaching sessions, give Mr. Kennedy examples of what problems he might experience at home and ask him how he would respond to the situations (e.g., "If the wound's drainage increases and it looks like there is pus, what would you do?").
- Provide Mr. Kennedy with the Web address for the Canadian Diabetes Association.

Affective Interventions

- Encourage Mr. Kennedy to attend a support group meeting if possible to facilitate learning from others' experiences.
- Encourage Mr. Kennedy to verbalize his feelings and fears about this change in his health status.
- Have Mr. Kennedy role play how he will respond to his friends when they ask him about his health status.
- As he acquires new skills and behaviours, provide Mr. Kennedy with feedback and positive reinforcement.

Psychomotor Interventions

- Demonstrate insulin preparation and injection techniques.
- Demonstrate use of blood glucose meter and recording of blood glucose measurements.
- Demonstrate dressing changes.
- Ask Mr. Kennedy to perform return demonstrations of insulin preparation and injection, blood glucose testing, and dressing changes.



Figure 20-2 Using the administration of medication to assess a patient's knowledge about medications and provide additional information as needed.

desired behaviour is likely to repeat the behaviour. People usually respond better to positive reinforcement (Bastable, 2008). The effects of negative reinforcement, such as criticizing, can decrease an undesired response but are less predictable and often undesirable. Feedback is a common form of reinforcement.

Three types of reinforcers are social, material, and activity. Most nurses use social reinforcers (e.g., encouraging words) to acknowledge a learned behaviour. Examples of material reinforcers are food, toys, and music. These reinforcers work best with young children. Activity reinforcers are based on the principle that people are motivated to engage in an activity if after its completion they are able to engage in a more desirable activity. For example, patients with dementia may be more willing to bathe if they can go for a walk with you afterward. Activity reinforcers work when a patient is self-motivated. Choosing an appropriate reinforcer requires attention to individual preferences. Observing behaviour often helps reveal the best reinforcer to use. Reinforcers should never be used as threats and are not effective with every patient.

Incorporating Teaching Into Nursing Care

Many nurses teach effectively while delivering nursing care. This activity becomes easier as you gain confidence in clinical skills. For example, while hanging a blood bag, you explain why the blood is needed, and you describe the symptoms of transfusion reactions that should be reported immediately. When you follow a teaching plan informally, the patient feels less pressure to perform, and learning becomes more of a shared activity. Teaching during routine care is efficient and cost-effective (Figure 20-2).

Together with the patient, you identify goals and learning strategies.

Entrusting. The entrusting approach provides the patient with the opportunity to manage self-care. You observe the patient's progress and remain available to assist without introducing more new information. For example, a patient with metabolic syndrome has decided to make lifestyle changes (e.g., improve diet and exercise) to improve his or her health. You provide resources and recommend other sources of information. You meet with the patient on a regular basis to check progress and provide additional information.

Reinforcing. Reinforcement is the use of a stimulus that increases the probability of a response. A person who receives positive reinforcement before or after learning a

Implementing Teaching Methods

Your choice of teaching methods depends on the patient's learning needs, the time available for teaching, the environment, the resources, and the nurse's own comfort level with teaching. Skilled teachers are flexible in altering teaching methods according to the learner's responses and in using teaching tools that work best with a particular method. Various teaching tools are detailed in Table 20-2.

One-on-One Discussion. In one-on-one discussion, you present information informally, providing the patient with the opportunity to ask questions or share concerns. During the discussion, you can use various teaching aids such as models or diagrams, depending on the patient's learning needs.

Group Instruction. Groups are an economical way to teach several patients at once. Patients interact and learn from other's experiences. Groups can also foster positive attitudes that help patients meet learning objectives (Rankin & Stallings, 2005).

Group instruction often involves both lecture and discussion. Lectures are highly structured and help patients learn standard content. However, they do not encourage active thinking; thus, discussion and practice sessions are essential (Rankin & Stallings, 2005).

Preparatory Instruction. Patients are often anxious about unfamiliar tests or procedures. By providing information about procedures, you help patients anticipate what will

► TABLE 20-2 Teaching Tools for Instruction

Description of Tool

Printed Material

Written teaching tools such as pamphlets, booklets, and brochures

Implications for Learning

Material must be easily readable for learner.
Information must be accurate and current.
Method is ideal for understanding complex concepts and relationships.

Programmed Instruction

Written sequential presentation of learning steps requiring that learners answer questions and that teachers tell them whether their answers are right or wrong

Instruction is primarily verbal, but teacher may use pictures or diagrams.
Method requires active learning, giving immediate feedback, correcting wrong answers, and reinforcing right answers.
Learner works at own pace.

Computer Resources

Computer Programs

Programmed instruction format in which computers store response patterns for learners and select further lessons on basis of these patterns (programs can be individualized)

Method requires reading comprehension, psychomotor skills, and familiarity with computer.

Internet Resources

Provides access to instructional resources which might not be available locally and which may be interactive and include demonstrations, video clips, self-directed modules, Web-based learning

Method requires access to the Internet, psychomotor skills, and familiarity with computer.

Audiovisual Materials

Diagrams

Illustrations that show interrelationships by means of lines and symbols

Method demonstrates key ideas and summarizes and clarifies key concept.

Graphs (Bar, Circle, or Line)

Visual presentations of numerical data

Graphs help learner to grasp information quickly about single concept.

Charts

Highly condensed visual summaries of ideas and facts that may highlight series of ideas, steps, or events

Charts demonstrate relationship of several ideas or concepts.
Method helps learners know what to do.

Pictures

Photographs or drawings used to teach concepts in which the third dimension of shape and space is not important

Photographs are more desirable than diagrams because they more accurately portray the details of the real item.
Drawings are pertinent for removing the superfluous detail present in real objects.

Physical Objects

Use of actual equipment, objects, models or simulation to teach concepts or skills

Models are useful when real objects are too small, large, or complicated or are unavailable.
Learners can manipulate objects that are to be used later in skill.

Other Audiovisual Materials

Slides, audiotapes, television, and videotapes used with printed material or discussion

Materials are useful for patients with reading comprehension problems and visual deficits.

happen. Guidelines for giving preparatory explanations are as follows:

- Describe physical sensations during the procedure, but do not evaluate them. For example, when you draw a blood specimen, explain that the patient will feel a sticking sensation as the needle punctures the skin.
- Describe the cause of the sensation to prevent misinterpretation of the experience. For example, explain that a needle stick burns because the alcohol used to cleanse the skin enters the puncture site.
- Prepare patients only for aspects of the experience that are common to other patients. For example, explain that it is normal for a tight tourniquet to cause a person's hand to tingle and feel numb.

Demonstrations. Demonstrations help teach psychomotor skills such as preparing a syringe, bathing an infant, walking with a crutch, or measuring a pulse. Patients are able to observe a skill before practising it. Demonstrations are most effective when patients first observe you and then perform a **return demonstration** to practise the skill. A demonstration should be combined with discussion to clarify concepts and feelings. An effective demonstration requires advanced planning:

- Position the patient to provide a clear view of the demonstration.
- Review the rationale and steps of the procedure.
- Assemble and organize equipment. Make sure it works.
- Perform each step in sequence while analyzing the knowledge and skills involved.
- Determine when to give explanations, considering the patient's learning needs.
- Adjust speed and timing of the demonstration according to the patient's abilities and anxiety level.

You demonstrate the steps of a procedure in the same order in which the patient will perform them. The demonstration involves the following:

- Performing each step slowly and accurately
- Encouraging the patient to ask questions so that each step is understood
- Explaining the rationale for each step
- Allowing the patient to observe each step
- Providing the patient with the opportunity to handle equipment and practise the procedure under supervision

The patient demonstrates the procedure to ensure that learning has occurred. The demonstration should occur under the same conditions that will be experienced at home or in the place where the procedure is to be performed. For example, for a patient learning to walk with crutches, you simulate the home environment. If short, narrow steps lead to the patient's bedroom, the patient should learn to climb similar stairs in the hospital.

Analogies. Learning occurs when a teacher translates complex language or ideas into words or concepts that the patient understands. **Analogies** aid learning by supplementing verbal instruction with familiar images that make complex information simpler and understandable. For example, to explain arterial blood pressure, an analogy is the flow of water through a hose. To use analogies, follow these general principles:

- Be familiar with the concept.
- Know the patient's background, experience, and culture.
- Keep the analogy simple and clear.

Role Playing. Role playing helps teach new ideas and attitudes. During role playing, patients play themselves or

someone else and rehearse a desired behaviour. For example, you can teach a parent to respond to a child's behaviour by pretending to be a child having a temper tantrum. This role playing provides the parent with the opportunity to practise responding in this situation. You evaluate the parent's response and determine whether an alternative approach would be more appropriate. Role playing helps patients learn skills and feel confident in their ability to perform them independently.

Simulation. Simulation helps teach problem solving, application, and independent thinking. During individual or group discussion, a nurse poses a problem or situation for patients to solve. For example, patients with heart disease are asked to plan a low-fat meal. You ask the patients to present their diet, providing an opportunity to identify mistakes and reinforce correct information.

Paying Attention to Learning Barriers. Many situations or conditions present a barrier to learning. For example, the patient may have a low reading level (functionally illiterate), a learning disability, a sensory alteration, or depression; may be suffering the effects of prescribed medications or adjusting to life changes or transitions; or may have a poor memory. Patients understand fewer medical words than health care providers predict. Unfortunately, health care providers often use medical terminology and jargon, which prevents patients from understanding the written health information they are given (Sand-Jecklin, 2007). Professionals should pay special attention to the learning needs of patients who have reading problems, learning disabilities, and sensory alterations and of those whose first language is not English or French.

Illiteracy and Learning Disabilities. A 2005 survey on literacy rates in Canada (Statistics Canada & Organisation for Economic Cooperation and Development, 2005) revealed that about 15% of Canadian adults fall within the lowest level of literacy. These people have only rudimentary reading and writing skills; for example, they are not able to read and understand a label on a medicine container. An additional 27% of Canadians can read only material that is simple and familiar. Therefore, almost half of Canadians have problems with reading materials encountered in everyday life. To compound this problem, the readability of printed material ranges from elementary school level to college level. Researchers have found that printed educational material is consistently written above most patients' reading level (Cutilli, 2005; Demir et al., 2008). Health care providers need to screen materials for readability and clarity.

Some people have learning disabilities, which are disorders that may impair ability to acquire, organize, remember, understand, or apply information (Learning Disabilities Association of Canada, 2002). The ability to learn or use oral or written language, mathematics, or both may be poor. Teaching strategies need to be adapted to accommodate their learning needs. For example, patients with attention deficit-hyperactivity disorder may have difficulty recalling information and staying focused during educational sessions; they may also have a low threshold of frustration (Bastable, 2008). Teaching activities should be kept short in an environment with minimal competing stimuli.

Health Literacy. Health literacy refers to a patient's ability to find, access, read, and understand reliable health information and to use that information to make informed decisions about their health. Many patients have difficulty accessing and understanding health information (Squellati,

2010). Aspects of health literacy of particular note are the ability to identify and access reliable information. Patients no longer depend solely on their health care provider. They are bombarded with health related advertisements and may seek information on the Internet, some of which is incomplete or inaccurate. They can be either well-informed about their health or misinformed about their health, depending on their health literacy. Patient information needs to be presented clearly, avoiding medical terminology, jargon, and acronyms that the patient may not be familiar with.

Sensory Alteration and Other Barriers. Some patients, including many older adults, have sensory deficits (see Chapter 47). Sensory changes such as visual and hearing deficits necessitate teaching methods that enhance functioning. For example, you face a patient with hearing problems and speak in a low tone of voice during discussions (lower tones are easier to hear than are higher tones). Clearly written materials should be provided. Patients with visual problems can benefit from large-print materials. Patients with slower cognitive function and reduced short-term memory (such as some older adults and patients who have had strokes) learn and remember effectively if the learning is paced properly and the material is relevant to the learner's needs and abilities.

Language

The diverse backgrounds of Canadians can challenge you to provide culturally sensitive care (see Chapter 9). Patients may not understand instructions that are not in their native language (see Chapter 17). You need to ascertain a patient's

fluency in English or French before you choose teaching methods or tools.

Cultural Diversity

You need to have knowledge of patients' cultural background, values, and beliefs (see Chapter 9), as well as the patient's ability to understand both verbal and written material (Cutilli, 2006). When educating patients of cultural groups different from your own, you need to be aware of the distinctive aspects of their cultures and develop teaching strategies that are respectful of cultural beliefs, values, and behaviours.

Needs of Patients With Severe Illness

Adapting to serious illness or disability is difficult for most people. They need to grieve. The grieving process gives them time to adapt psychologically to the emotional and physical implications of illness. People experience grief (see Chapter 28) at different rates and sequences, depending on their self-concept before illness, the severity of the illness, and the changes and losses caused by the illness. Sensitivity is required to educate patients while they are grieving and adjusting to their illness.

Readiness to learn is related to the grieving stage (Table 20-3). Patients cannot learn when they are unwilling or unable to accept the reality of illness. However, properly timed teaching can help a patient to adjust to illness or disability. You must identify the patient's stage of grieving on the basis of the patient's behaviours. When the patient enters the stage of acceptance, the stage compatible with learning, you can

► **TABLE 20-3 Relationship Between Learning and Psychosocial Adaptation to Illness**

Stage	Patient's Behaviour	Nursing Activities	Rationale
Denial or disbelief	Patient avoids discussion of illness ("Nothing is wrong with me"), withdraws from others, and disregards physical restrictions. Patient suppresses and distorts information that has not been presented clearly.	Provide support, empathy, and careful explanations of all procedures while they are being done. Let patient know you are available for conversation. Explain situation to family or significant other if appropriate. Teach in present tense (e.g., explain what patient needs to know to be discharged).	Patient is not prepared to deal with problem; attempts to teach patient will result in further anger or withdrawal. Provide only information that patient pursues or requires.
Anger	Patient blames, complains, and often directs anger toward nurse or others.	Do not argue with patient, but listen to concerns. Teach in present tense. Reassure family of the normality of patient's behaviour.	Patient needs opportunity to express feelings and anger. Patient is still not prepared to face future.
Bargaining	Patient offers to live better life in exchange for promise of better health (e.g., "If God lets me live, I promise to manage my disease better").	Continue to introduce only reality and teaching in present tense.	Patient is still unwilling to accept limitations.
Resolution	Patient begins to express emotions openly, realizes that illness has created changes, and begins to ask questions.	Encourage expression of feelings. Begin to share information needed for future, and set aside formal times for discussion.	Patient begins to perceive need for assistance and is ready to accept responsibility for learning.
Acceptance	Patient recognizes reality of condition, actively pursues information, and strives for independence.	Focus on future skills and knowledge required. Continue to teach in present tense. Involve family in planning and teaching for discharge.	Patient is more easily motivated to learn. Acceptance of illness reflects willingness to deal with its implications.

introduce a teaching plan. Continuous assessment of the patient's behaviours determines the stages of grieving.

❖ Evaluation

Patient education is not complete until you evaluate outcomes of the teaching-learning process (see Box 20-8). You must determine whether patients have learned the material. Evaluation reinforces correct behaviour, helps learners realize how they should change incorrect behaviour, and helps you determine the adequacy of the teaching (Redman, 2007). Success depends on the patient's ability to meet the established outcome and goals by which you can evaluate success. The following checklist helps evaluate patient education (Rankin & Stallings, 2005):

- Were the objectives clearly stated in a way that allowed patient behaviours to be observed?
- Were the patient's goals or outcomes realistic?
- Were the learner's needs assessed thoroughly?
- Did the patient perceive the education as important, and did the patient state a willingness to change behaviour?
- What obstacles or problems were encountered that provided barriers to change?
- Were educational goals set mutually between the nurse and the patient?
- Were the interventions individualized to help the patient meet the learning objectives?
- Was the patient's behavioural change measured and documented accurately?
- Does the patient continue to have a skill deficiency? If so, what changes in interventions should be made to enhance skill attainment?
- Does any follow-up or reassessment need to be performed?

Measurement Methods

Under direct observation, the patient should demonstrate the behaviours described in the learning objectives. If the evaluation process indicates a deficit in knowledge or skill, you must repeat or modify the teaching plan. By watching patients demonstrate behaviours, you can see whether correct techniques are used. However, a patient may behave differently later. Therefore, observation works best in real-life situations.

Oral and written questioning are other useful evaluation methods. Questions are best used for behaviours that are not easily demonstrated. You should phrase questions to ensure that the learner understands them and that objectives are truly measured.

Another form of evaluation includes self-reports (oral and written) and self-monitoring (written). An example is a patient's written log of the foods eaten in a specific time period, in comparison with a new diet. You rely on the patient's honesty and memory in self-reporting.

Patient Expectations

Evaluations of nursing care and teaching sessions help determine whether a patient's needs and expectations have been met. At the end of the session, you ask the patient whether he or she has questions; in this way, you can identify information that was missing and should have been covered. Patients may also fill out written evaluations of a teaching session or course. Anonymous written evaluations may be more truthful than are face-to-face evaluations.

Evaluation may reveal new learning needs or new factors that are interfering with learning, in which case you should try alternative teaching methods. When a patient has difficulty in an acute care setting, you may make a referral to resources, such as home care or an outpatient clinic, for further education and evaluation.

Documentation

Because patient teaching often occurs informally, it is difficult to document it consistently. You are legally responsible for providing accurate, timely information that promotes continuity of care; therefore, it is essential to document the outcomes of teaching. Rankin and Stallings (2005) suggested documenting the following with regard to patient education:

- *Assessment data and reassessment of learning needs.* Such data and evaluation provide important information needed when the teaching plan is developed.
- *Nursing diagnoses, patient needs, and educational priorities.* These provide support for goals and outcomes that are established.
- *Interventions planned.* A specific plan, including the methods to be used in instruction, enhances continuity of care. When viewing the planned interventions, you can determine what information needs to be provided to the patient.
- *Interventions provided.* Specifically describing the subject matter enables other nurses to follow up and reinforce teaching (e.g., "Explained side effects of Inderal" or "Demonstrated umbilical cord care"). Note the date, time, and specific patient or patients taught. Avoid generalizations (e.g., "medications taught"). Resources used, such as pamphlets or audiovisual materials, are documented in the patient's record.
- *Patient's response and outcomes of care.* In documenting evidence of learning (e.g., a return demonstration or the ability to verbalize the purpose and side effects of a medication), you inform staff about the patient's progress and determine information that must still be taught.
- *Ability of patient, family, or both to manage needs after discharge.* An evaluation of remaining educational needs on discharge helps identify the need for outpatient or home health care follow-up. If referrals are appropriate, the patient, family, or both are often able to meet their needs.

❖ KEY CONCEPTS

- The nurse ensures that patients, families, and communities receive information needed to maintain optimal health.
- Health education is aimed at the promotion, restoration, and maintenance of health.
- Teaching is most effective when it is responsive to the learner's needs.
- Teaching is a form of interpersonal communication, with the teacher and student actively involved in a process that increases the student's knowledge and skills.
- The ability to learn depends on a person's physical and cognitive attributes.
- The ability to attend to the learning process depends on physical comfort and anxiety levels and on the presence of environmental distraction.
- A person's health beliefs influence the willingness to gain knowledge and skills necessary to maintain health.
- Teaching must be timed to coincide with the patient's readiness to learn.

- Patients of different age groups require different teaching strategies as a result of developmental capabilities.
 - The patient should be an active participant in a teaching plan: agreeing to the plan, helping choose instructional methods, and recommending times for instruction.
 - Learning objectives describe what a person is to learn in behavioural terms.
 - A combination of teaching methods improves the learner's attentiveness and involvement.
 - A teacher is more effective when presenting information that builds on a learner's existing knowledge.
 - Nurses should assess which learning materials, methods, and approaches will be most effective for each patient, on the basis of each patient's individual abilities and challenges.
 - A nurse evaluates a patient's learning by observing performance of expected learning behaviours under desired conditions.
 - Effective documentation describes the entire process of patient education, promotes continuity of care, and demonstrates that educational standards have been met.
2. You should plan to teach a patient about the importance of exercise
 1. When visitors are in the room
 2. When the patient's pain medications are effectively managing pain
 3. Just before lunch, when the patient is most awake and alert
 4. When the patient is talking about current stressors in his or her life
 3. A patient with newly diagnosed cervical cancer is going home. The patient is avoiding discussion of her illness and postoperative orders. In teaching the patient about discharge instructions, you should
 1. Teach the patient's spouse
 2. Focus on knowledge the patient will need in a few weeks
 3. Provide only the information the patient needs to go home
 4. Convince the patient that learning about her health is necessary

❖ CRITICAL THINKING EXERCISES

1. Mrs. S. has a 10-year history of hypertension and a 5-year history of diabetes. Recently, her hypertension has worsened and she has received a diagnosis of depression. Her medications, which have recently been changed, include 25 mg of captopril (Capoten) three times a day; 240 mg of diltiazem (Cardizem CD) every morning; 1500 mg of metformin (Glucophage XR) before the evening meal; and 100 mg of sertraline (Zoloft) by mouth at bed time. You identify the priority nursing diagnosis as *deficient knowledge related to change in medications*. You want to develop a plan of care in which the three domains of learning are used. What are the patient's teaching priorities? Which learning needs would necessitate a cognitive method? Which needs would be more appropriate to satisfy through affective or psychomotor methods?
 2. You are caring for a patient who is being discharged after an appendectomy. He takes medication to treat attention deficit-hyperactivity disorder. Which teaching strategies should you use when providing discharge information to this patient?
 3. A 23-year-old man has recently sustained a spinal cord injury after being involved in a diving accident that has left him paralyzed from the waist down. He verbally abuses the staff and expresses anger toward his family and friends when they come to visit. He needs to begin learning transfer techniques. Which stage of grieving is this patient experiencing? What approach should you take in planning education for this patient?
 4. A 65-year-old woman is taking her 72-year-old husband home after surgery. Which strategies should you use in helping this couple make the transition to home smoothly?
4. You are a community health nurse about to teach a Grade 12 health class about nutrition. To achieve the best learning outcomes, you should
 1. Provide information by using a lecture
 2. Use simple words to promote understanding
 3. Complete an extensive literature search focusing on eating disorders
 4. Develop topics for discussion that necessitate problem solving
 5. You are going to teach a patient how to perform a breast self-examination. The behavioural objective that would best measure the patient's ability to perform the examination is as follows:
 1. The patient will verbalize the steps involved in breast self-examination within one week.
 2. You will explain the importance of performing breast self-examination once a month.
 3. The patient will perform breast self-examination correctly before the end of the teaching session.
 4. You will demonstrate breast self-examination on a breast model provided by the Canadian Cancer Society.
 6. A patient who is having chest pain is about to undergo an emergency cardiac catheterization. Which of the following is the most appropriate teaching approach in this situation?
 1. Telling
 2. Selling
 3. Entrusting
 4. Participating

❖ REVIEW QUESTIONS

1. A patient must learn to use a walker. Acquisition of this skill will require learning in which domain?
 1. Cognitive
 2. Affective
 3. Psychomotor
 4. Attentional
7. You are teaching a parenting class to a group of pregnant adolescents and have given the adolescents baby dolls to bathe and talk to. This is an example of
 1. Discovery
 2. An analogy
 3. Role playing
 4. A demonstration

8. A patient with a learning disability is starting to take a new antihypertensive medication. In teaching the patient about the medication, you should
 1. Demonstrate measuring dosages and ask for a return demonstration
 2. Provide only written material
 3. Present the information once
 4. Expect the patient to understand the information quickly
9. A patient must learn how to administer a subcutaneous injection. You know the patient is ready to learn when the patient
 1. Has been given written instructions
 2. Expresses the importance of learning the skill
 3. Can see and understand the markings on the syringe
 4. Has the dexterity needed to prepare and inject the medication
10. A patient who is hospitalized has just received a diagnosis of diabetes. He needs to learn how to give himself injections. The best teaching method would be
 1. Demonstration
 2. Group instruction
 3. One-on-one discussion
 4. Simulation

❖ RECOMMENDED WEB SITES

Public Health Agency of Canada: <http://www.phac-aspc.gc.ca/index-eng.php>

This Web site provides information and resources on a variety of public health issues and topics, including health promotion, healthy living, diseases, and injury prevention.

Health Canada: <http://www.hc-sc.gc.ca>

This Web site provides many resources on a variety of health issues and topics to assist in patient education:

Canadian Public Health Association: <http://www.cpha.ca/en/default.aspx>

This Web site provides both national and international information and resources on public health issues and services.

National Institutes of Health: <http://health.nih.gov/>

Prepared by the National Institutes of Health in the United States, this Web site provides a great many resources for patient education.

Review Question Answers

1. 3; 2. 2; 3. 3; 4. 4; 5. 3; 6. 1; 7. 3; 8. 1; 9. 2; 10. 1

Rationales for the Review Questions appear at the end of the book.

Developmental Theories

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Canadian content written by Nicole Letourneau, RN, PhD

objectives

Mastery of content in this chapter will enable you to:

- Define the key terms listed.
- Identify basic principles of growth and development.
- Discuss factors influencing growth and development.
- Identify five major traditions that underlie modern developmental theories.
- Name and describe the major developmental theories associated with each tradition.
- Describe and compare the mechanisms that underlie the major developmental theories.
- Discuss nursing implications associated with the application of developmental principles to patient care.

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<http://evolve.elsevier.com/Canada/Potter/fundamentals/>

- Audio Chapter Summaries
- Examination Review Questions
- Glossary
- Student Learning Activities
- Weblinks

media resources

key terms

- Accommodation, p. 313
- Assimilation, p. 313
- Attachment, p. 319
- Autonomous stage, p. 314
- Biophysical developmental theories, p. 311
- Bowlby's attachment and separation theory, p. 319
- Bronfenbrenner's bioecological theory, p. 321
- Cognitive developmental theories, p. 313
- Contextual tradition, p. 321
- Conventional stage, p. 314
- Developmental health, p. 322
- Dialectic tradition, p. 322
- Differentiation, p. 312
- Dynamic maturational model of attachment, p. 319
- Ego, p. 316
- Epigenesis, p. 319
- Erikson's theory of eight stages of life, p. 317
- Exosystem, p. 321
- Freud's psychoanalytic model of personality development, p. 315
- Havighurst's developmental tasks, p. 320
- Id, p. 316
- Individuation, p. 315
- Kohlberg's theory of moral development, p. 315
- Libido, p. 316
- Macrosystem, p. 322
- Maturation, p. 312
- Mechanisms of development, p. 310
- Mechanistic tradition, p. 321
- Mesosystem, p. 321
- Microsystem, p. 321
- Moral developmental theories, p. 313
- Organicism, p. 311
- Piaget's theory of cognitive development, p. 313
- Piaget's theory of moral development, p. 314
- Population health approach, p. 322
- Premoral stage, p. 314
- Protective processes, p. 323
- Psychoanalytic and psychosocial tradition, p. 315
- Resilience, p. 323
- Separation, p. 315
- Superego, p. 317
- Temperament, p. 312
- Vulnerability processes, p. 323
- Zone of proximal development, p. 322

All people progress through phases of growth and development, from the simple to the complex, at a highly individualized rate. Understanding typical growth and development helps nurses to predict, prevent, and detect any changes from patients' expected patterns and to develop approaches and programs that can further enhance the developmental well-being of individuals (Berk, 2006; Bukatko & Daehler, 2004). Understanding the impact of early experience on development in adulthood provides the foundation for nurses to advocate for appropriate developmental care for vulnerable children and families (McCain et al., 2007). Developmental theories also help nurses to assess and treat a patient's response to an illness. Understanding the process of human development helps caregivers to plan appropriate individualized care for patients (Berk, 2008; Edelman & Mandle, 2006).

For many years, human growth and development have been described as orderly, predictable processes beginning with conception and continuing until death. This view is increasingly being recognized as overlooking differences in gender, culture, and sexuality. Today, it is no longer assumed that all people progress through universal linear phases of growth and development. Human growth and development are now seen as processes in which sociocultural, biological, and psychological forces interact with the individual over time (Berk, 2008). As a result, theorists have changed focus from describing growth and development to explaining it. How do humans develop? What are the mechanisms, or explanatory components, that underlie human growth and development?

In this chapter, five broad traditions of human development are introduced, and the mechanisms of development espoused by key theorists are outlined. Examples of implications for the nursing process that follow from the mechanisms are offered. Detailed descriptions of human development appear in Chapters 22, 23, and 24.

Growth and Development

Growth and development are synchronous processes that are interdependent in the healthy individual. Growth and development depend on a sequence of endocrine, genetic, constitutional, environmental, and nutritional influences (Edelman & Mandle, 2006).

Physical Growth

Growth is the quantitative, or measurable, aspect of an individual's increase in physical measurements. Measurable growth indicators include changes in height, weight, teeth, skeletal structures, and sexual characteristics. For example, children generally double their birth weight by 5 months of age and their birth height by 36 months. Physical growth is not only genetic but is also affected by other contextual factors such as socioeconomic status.

Development

Development is a progressive and continuous process of change leading to increased skill and capacity to function. Development is the result of complex interactions between biological and environmental influences (Salkind, 2004). These changes are qualitative in nature and difficult to measure in exact units. Developmental changes have certain predictable characteristics: they proceed from simple to complex, from general to specific, from head to toe (cephalocaudal), and from the trunk to the extremities (proximodistal). For example, a

child's progressions from rolling over to crawling to walking are developmental changes.

Factors Influencing Growth and Development

Three major categories of factors influence human growth and development: (1) genetic or natural forces within the person, (2) the environment in which the person lives, and (3) the interaction that takes place between these two factors (Table 21-1). You apply knowledge of these factors when selecting approaches to promote typical growth and developmental progression. It is important, for example, that as part of planning for a patient's pregnancy, you consider the patient's genetic endowment, age, socioeconomic status, culture (Box 21-1), available support system, and preconceived state of health.

Traditions of Developmental Theories

A theory is an organized, often observable, logical set of statements about a subject. Human developmental theories are models intended to account for how and why people develop as they do (Thomas, 1997). All of the theories of development discussed in this chapter make different contributions to our understanding of the developmental process.

To help you understand the number of developmental theories, this chapter has been grouped into five traditions of (or ways of thinking about) theory development: organicism, psychoanalytic and psychosocial, mechanistic, contextualism, and dialecticism. The areas of learning and spiritual development are covered in Chapters 20 and 27, respectively.

Each tradition of developmental theory emphasizes different underlying developmental mechanisms. **Mechanisms of development** are the explanatory components of each theory, or the means by which the developmental tasks are achieved. They are the processes or factors that underlie the developmental process within each theory, and they enable developmental progression. These underlying mechanisms are proposed to be universal and to function across the lifespan, not just in childhood. Although developmental theories are often presented within a framework of stagelike progressions, what the stages actually represent are the outcomes produced by these mechanisms at each specific age.

► BOX 21-1

Cultural Aspects of Care: Canadian First Nations People

You need to assess the cultural background of each patient and be prepared to change your practice so that it is congruent with the patient's beliefs and values concerning growth and development. For example, within many Aboriginal cultures, the concept of a circle or cycle is a fundamental theme (Smylie, 2001) and can be applied to human development. Human states and concepts are considered to be part of the life cycle of the earth, which also includes plants, animals, and seasons (Smylie, 2000). For Aboriginal people, this life cycle may be described as a continuum of age-related roles and qualities of being, including physical, mental, emotional, and spiritual well-being. All aspects of human development are viewed as being in harmony with the cycle of life in nature. As in nature, each part of the cycle needs to be balanced with the other parts. Roles and expectations related to developmental age reflect traditional values of respect, honour, balance, and harmony. Figure 21-1 represents the circle of life, or the medicine wheel, as applied to the human life cycle.

► **TABLE 21-1** Major Factors That Influence Growth and Development

Categories	Implications
Genetic or Natural Factors	
Heredity	Genetic endowment determines sex, skin, hair and eye colour, physical growth, stature, and, to some extent, psychological uniqueness.
Temperament	Temperament is the characteristic psychological mood with which the child is born; it influences interactions between an individual and the environment.
Environmental Factors	
Family	Family purposes are to protect, teach, and nurture its members. Family functions include means for survival, security, assistance with emotional and social development, assistance with maintenance of relationships, instruction about society and world, and assistance in learning roles and behaviours.
Peer group	Family influences through its values, beliefs, customs, and specific patterns of interaction and communication. Peer group provides a new and different learning environment. Peer group provides different patterns and structures of interaction and communication, necessitating a different style of behaviour. Functions of peer group include allowing individual to learn about success and failure; to validate and challenge thoughts, feelings, and concepts; to receive acceptance, support, and rejection as a unique person apart from family; and to achieve group purposes by meeting demands, pressures, and expectations.
Health environment	Level of health affects an individual's responsiveness to environment and responsiveness of others to the individual.
Nutrition	It determines availability and accessibility of resources to support health. Growth is regulated by dietary factors. Adequacy of nutrients influences whether and how physiological needs, as well as subsequent growth and development needs, are met.
Rest, sleep, and exercise	The availability of quality nutrients also affects growth. Balance between rest, sleep, and exercise is essential for rejuvenating the body.
Living environment	Disturbances diminish growth, whereas equilibrium reinforces physiological and psychological health. Factors affecting growth and development include season, climate, community life, socioeconomic status, and quality of the physical environment (air, water, land). An embryo may be exposed to teratogenic substances (e.g., alcohol, chemicals, or radiation) that cause abnormal development.
Political and policy environment	Municipal, provincial, and federal policies directly affect the health and well-being of individuals, families, and communities.
Interacting Factors	
Life experiences	Individuals develop by applying what has been learned through experience to their current situation. Experiences emerge from both biological and environmental sources. The individual deduces meaning from these experiences and bases further actions on them.
Prenatal health	Biological and maturational factors (genetics; maternal age; medical problems) and environmental factors (maternal health; stress, nutrition; use of tobacco, drugs, and alcohol; use of prenatal services) together affect fetal growth and development.
State of health	Health is a product of both intrinsic (biology) and extrinsic (quality of environment, availability of resources for health) factors. Changes to health status such as illness or injury may cause inability to cope with and respond to underlying processes and demands of development.

Organicism

Organicism refers to a theoretical focus on the organism itself. According to theories in this tradition, development is a result of biologically driven behaviour and the person's adaptation to the environment. Biophysical and cognitive-moral theories of development are included in this tradition.

Biophysical Developmental Theories

Biophysical developmental theories describe and explain how the physical body grows and changes. The changes that occur as a person grows from fetus, to neonate, to child and

finally adult can be quantified and compared against established norms; however, regional and cultural differences may exist, as may differences related to the availability of resources in the environment for adequate growth.

How does the physical body age? What are the triggers that change the body's physical characteristics from childhood through adolescence to adulthood? Biological influences on development include many factors such as genetics and exposure to teratogens (e.g., maternal diseases, drugs, X-rays, or other hazardous substances that interfere with the normal development of the fetus). All biophysical developmental theories give some credence to the roles of nature (genetics) and

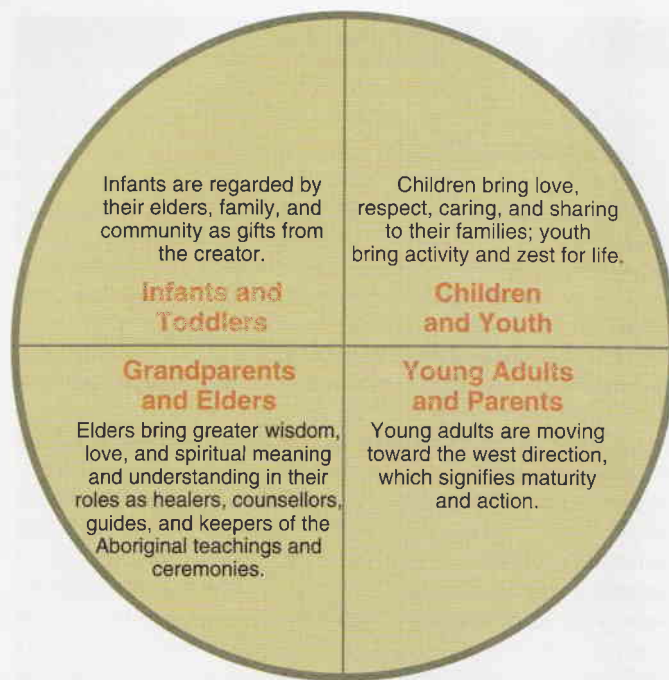


Figure 21-1 An Aboriginal perspective on human development: the circle of life, or the medicine wheel, as applied to the human life cycle. **Source:** Redrawn from Smylie, J. (2001, January). A guide for health professionals working with Aboriginal peoples: Health issues affecting Aboriginal peoples. *Journal SOGC*, 100, 55.

nurture (caregiving environment and resources). However, the theories differ sharply on how much influence individual and environmental forces have on development (Berk, 2006).

Gesell's Theory of Maturation Development.

Arnold Gesell (1880–1961) was a psychologist who obtained his medical degree to help him explain the physiological processes he observed in the behaviour of children. Through extensive observations in the 1940s, he developed behavioural norms that serve as a primary source of information for childhood development today.

Fundamental to Gesell's theory of development is the notion that the pattern of growth and development is directed by the activity of the genes, although at that time, the genetic mechanism was unknown to him. He believed that environmental factors can support, change, and modify the pattern but do not generate the progressions of development (Gesell, 1948). Gesell proposed that the pattern of maturation follows a fixed developmental sequence in all humans and that critical periods exist in which the presence or absence of particular experiences makes a biological system functional or nonfunctional (Keating & Hertzman, 1999). For example, if a child's visual defect is not identified until the start of school, usual message pathways in the brain may not become fully developed, and long-term vision may be impaired (Cynader & Frost, 1999).

Sequential development is seen in fetuses, in which the order of development of the various organ systems is specific (Crain, 2005). After birth, children grow according to their genetic blueprint and gain skills in an orderly manner, but at each individual's own pace. For example, most children learn first how to hold a cup with digital grasp at about 15 months of age and later how to lift, drink from, and replace the cup at 21 months of age. Gesell clarified that not every child develops

those skills at exactly the same ages. He pointed out that the environment does play a part in the development of the child but that it does not have any part in the sequence of development. Gesell believed that children could not be pushed to develop faster than their own unique timetables permitted. He also proposed that the biological body determines behavioural development. Researchers continue to use Gesell's theories today, probing for gene–environment interactions in human development (Cicchetti, 2007).

Mechanisms of Maturation Development. **Maturation** is the biological internal regulatory mechanism that governs the emergence of all new skills and abilities that appear with advancing age (Nelson et al., 2006). Maturation involves an individual's biological ability, physiological condition, and desire to learn more mature behaviour. To mature, the individual may have to relinquish previous behaviour and learning, integrate new patterns into existing behaviour, or both. Maturation influences the sequence and timing of the changes associated with growth and development. For example, the child relinquishes crawling for walking because walking permits greater investigation of the environment and more learning. However, the child cannot walk until the biological ability and structures to perform the action (i.e., increased muscle cells and tone) have developed.

Differentiation is the process by which cells and structures become modified and refine their characteristics. Development of activities and functions progresses from simple to complex. Embryonic cells begin as vague and undifferentiated and develop into complex, highly diversified cells, tissues, and organs.

Nursing Implications of Maturation Development.

As a nurse, you consider maturational development in your care planning when you help mothers sequence play activities appropriate for learning of sitting, rolling, creeping, crawling, and walking. You consider sequential development of fetuses and critical periods when you counsel expectant mothers about environmental teratogens during the first trimester of pregnancy. You support development during critical periods when you develop early intervention programs for parents.

Chess and Thomas's Theory of Temperament Development. **Temperament** is a physical and emotional response style that affects a child's interactions with others (Hockenberry & Wilson, 2007). It is the way a person adjusts to life experiences, and it is thought to originate within the person's genetic makeup. A child's temperament influences how others respond to the child and to his or her needs. Knowledge of temperament helps parents to have a clearer perspective of their child and enables health care providers to guide them appropriately (Hockenberry & Wilson, 2007).

Psychiatrists Stella Chess (1914–2007) and Alexander Thomas (1915–2003) conducted a landmark 20-year longitudinal study of development that included children from a range of populations, including children of middle-income parents and intellectually disabled children of lower-income parents. The breadth of the data allowed them to look at the behaviour of people from childhood to early adulthood as they interacted with their environment. Their work defined the concept of temperament (Chess & Thomas, 1995), and they proposed that temperament is biologically derived.

Chess and Thomas (1995) described three common categories of temperament, but individual variation meant that approximately 30% of children cannot be classified in any of these groups:

- The *easy child* is easygoing and even-tempered, regular and predictable in his or her habits, and open-minded and adaptable to change. Mood expressions are mild to moderately intense and typically positive.
- The *difficult child* is highly active, irritable, and irregular in habits. Negative withdrawal from other people is typical, and the child requires a highly structured environment. He or she adapts slowly to new routines, new people, or new situations. Mood expressions are usually intense and primarily negative.
- The *slow-to-warm-up child* typically reacts negatively and with mild intensity to new stimuli. He or she adapts slowly with repeated contact unless pressured and responds with mild but passive resistance to novelty or changes in routine.

Mechanisms of Temperament Development. According to temperament theory, biologically derived temperament characteristics drive children's interaction with the environment. Chess and Thomas (1995) proposed that it is through "goodness of fit" between the individual and the immediate environment that human development is modulated. This proposal places significant responsibility for child development outcomes within the family. For instance, the difficult child who has trouble making the transition from one activity or environment to a new one functions best in a family that maintains routine and has a slow, easy attitude toward the introduction of change. The same child in a family that has few routines has much more difficulty moving from one activity (such as play) to the next activity (such as sleep). The first scenario is an example of "goodness of fit" between the temperament of the child and the family environment. However, recent research suggests that temperament may be a function of fetal exposures to, for example, excessive maternal stress hormones during pregnancy or birth complications (de Weerth et al., 2003; de Weerth & Buitelaar, 2007).

Nursing Implications of Temperament Development. Nurses can help families identify the unique characteristics of their infants and children. For instance, a parenting program called "Keys to Caregiving" (Sumner, 1995) that consists of professional self-educational videos and parent pamphlets assists nurses in helping new parents identify their infants' usual behaviour and communication styles. Keys to Caregiving teaches new parents about infant cues and behaviours that signify needs (e.g., hunger, desire for playful attention), infant states and how to modulate infant states (e.g., helping soothe a fussy baby), and optimal parenting practices that promote sensitive, nurturant relationships between caregivers and infants. This information helps families adapt their habits and routines to match their children's temperaments. You can also consider temperament styles when working with adults and families in teaching or support situations.

Cognitive Developmental Theories

Cognitive developmental theories focus on reasoning and thinking processes, including the changes in how people perform intellectual operations. These operations are related to the ways people learn to understand the world in which they live. Mental processes, including perceiving, reasoning, remembering, and believing, affect certain types of emotional behaviour. For example, a child will have a different emotional reaction to the death of a grandparent than to the death of an older sibling or a parent.

Unlike biophysical developmental theories, cognitive developmental theories emphasize that although the developmental

process originates with the person, it is greatly influenced by interactions between the person and the environment. Therefore, theories of cognitive development emphasize the active role that the individual plays in the developmental process. Cognitive theories are considered to be within the organicism tradition because development is still viewed as originating within the organism.

Piaget's Theory of Cognitive Development. Jean Piaget (1896–1980), a Swiss biologist and philosopher, studied how people come to know their world. **Piaget's theory of cognitive development** addresses the development of children's intellectual organization and how they think, reason, perceive, and make meaning of the physical world. His theory includes four periods, each of which subsumes a number of stages (Table 21-2). He recognized that people move through these specific periods at different rates but in the same sequence or order (Berk, 2006; Crain, 2005). Piaget also theorized that this would be true in all cultures. He acknowledged that biological maturation plays a role in this developmental theory but believed that rates of development depend on the intellectual stimulation and challenge in the environment of the person. Piaget found that children acquire knowledge through acting on the environment. In other words, the individual plays an active role in his or her development.

Mechanisms of Cognitive Development. Although it is helpful to be aware of the stages, the importance of Piaget's theory is that development is considered a spontaneous process in which individuals play an active role in their own development. Environmental challenges are internalized through the mechanisms of assimilation and accommodation. **Assimilation** is the process of making sense of new information in comparison with what is already known. **Accommodation** is the process of adapting ways of thinking to a new experience or new information. Together, these processes reflect adaptation to new information or experience. In a health care situation, a person who has a headache can evaluate it as an everyday or usual experience. In this process, the person is assimilating it to what he or she knows already as the experience of his or her body; that is, the person occasionally has headaches. When headaches become extreme or constant, then the person needs to understand the headache pain differently in the experience of his or her body. For instance, the person may learn to see himself or herself as a person who has migraines or as a person with a brain tumour who requires surgery.

The mechanisms of cognitive development apply across the lifespan and to all patient situations. Thus, they also apply to the moral theories and theories of adult development that are described in the following sections.

Nursing Implications of Cognitive Development. Most patients need to know about new ways of adjusting or behaving with regard to their health. Assimilation and accommodation represent adaptation of the patient to new health challenges. You need to support this process by providing information and support as patients come to terms with new health situations. You must also offer positive feedback when patients successfully adapt to their challenges.

Moral Developmental Theories

Moral developmental theories are a subset of cognitive theory and describe the development of moral reasoning. *Moral reasoning* is how people think about the rules of ethical or moral conduct, but it does not predict what a person would actually

► TABLE 21-2 Piaget's Theory of Cognitive Development

Stage	Description	Nursing Implications
Period 1: Sensorimotor (birth to 2 years of age)	The infant develops the schema or action pattern for dealing with the environment (Berk, 2006; Singer & Revenson, 1996). These schemas may include mouthing, looking, vocalizing, grasping, or hitting (Figure 21-2). Schemas become self-initiated activities; for example, the infant who learns that mouthing or sucking achieves a pleasing result generalizes the action to suck fingers, blanket, or clothing. Successful achievement leads to greater exploration. In the second year, children are able to form primitive mental images as they acquire object permanence. Before this, they do not realize that objects out of sight exist. When a 6-month-old is shown a toy before it is hidden, he or she will not search for it. At 18 months, the child can understand that even if it cannot be seen, it still exists and will search for it.	Educate parents about the need to promote infants' exploration of the environment. Such education supports development of action patterns that help the children achieve motor and cognitive skills. Observe parents during interactions with their infants. Reinforce parents' sensitivity and responsiveness to infant behaviours.
Period 2: Preoperational (2 to 7 years of age)	Children learn to think with the use of symbols and mental images. Still egocentric, the child sees objects and people from only one point of view: the child's own. Play is the initial method of nonlanguage use of symbols. This is a time of parallel play. Parallel play can be observed as children engage in activities side by side without a common goal. Imitation and make-believe play are ways to represent experience (Berk, 2006; Singer & Revenson, 1996). Later, language develops and broadens possibilities for thinking about the past or the future. Children can now communicate about events with others. As the language fits into a logical form, it mirrors the thinking process at the time.	Recognize the use of play as the way the child understands the events taking place. Parents can be assisted in the use of play materials such as toy thermometers and stethoscopes to encourage children to communicate feelings about health care procedures. Parents can also be encouraged to read and use rich language with their children to promote literacy and language development.
Period 3: Concrete operations (7 to 11 years of age)	Children achieve the ability to perform mental operations. For example, the child can think about an action that before was performed physically. At the earlier stage, the child could count to 10, but at this stage, he or she can count and understand what each number represents. Children can describe a process without actually performing it. At this stage, they are able to coordinate two perspectives. In other words, they can appreciate the difference between their perspective and that of a friend. Reversibility is the primary characteristic of concrete operational thought. Children can mentally reverse the direction of their thoughts. Children can mentally classify objects according to their quantitative dimensions, known as seriation. Another major accomplishment of this stage is conservation, or the ability to see objects or quantities as remaining the same despite a change in their physical appearance (Berk, 2006; Singer & Revenson, 1996). Children can begin to cooperate and share with new information about the acts they perform.	Encourage parents to guide the child to perform helpful activities within the home, such as doing chores in exchange for privileges (television or computer time, play with friends). Parents can encourage children to take another person's perspective or to plan ahead in school work deadlines.
Period 4: Formal operations (11 years to adulthood)	The individual's thinking moves to abstract and theoretical subjects. Thinking can venture into such subjects as achieving world peace, finding justice, and seeking meaning in life. Adolescents can organize their thoughts in their minds. They have the capacity to reason with regard to possibilities. New cognitive powers allow the adolescent to achieve more far-reaching problem solving. This thinking matures, and the depth of understanding increases with experience.	Include the adolescent in decision making about his or her own health care that is based on his or her ability to think abstractly.

do in a given situation. *Moral development* is the ability of an individual to distinguish right from wrong and to develop ethical values on which to base his or her actions (Berk, 2006). Although various theorists have addressed moral development, Piaget and Kohlberg proposed the most comprehensive theories of moral development. These theories are within the organicism tradition because they are grounded in cognitive development theory and development is seen as originating from within the individual. The mechanisms of cognitive development and the general nursing interventions also apply to the moral development theories because they emerged from the original work of Piaget.

Piaget's Theory of Moral Development. Piaget believed that moral development goes through a series of successive stages, just as cognition and learning do. **Piaget's theory of moral development** presents three stages of morality: the **premoral stage**, the **conventional stage**, and the **autonomous stage**. In the premoral stage, the child feels no obligation to follow rules. In the conventional stage, children follow the rules set up by people in authority, such as their parents, teachers, clergy, or police. When a person reaches the stage of autonomous morality, moral judgements are based on mutual respect for the rules. A person also considers the consequences of a moral decision. In making moral judgements that involve



Figure 21-2 Successfully achieving action patterns, such as grasping, leads to learning and more exploration.

others, the person at this stage starts to consider information related to the subjective intent (Berk, 2006).

Piaget believed that children initially follow the rules without understanding them. Children see these rules as fixed and handed down by adults or by God and therefore think they cannot change them. Young children base their moral decisions on the extent of the consequences to the action, not necessarily on the action itself. For example, a young child will not eat a cookie before supper, not because the mother said not to but because the child is afraid of the punishment that would result if he or she did. Around 10 or 11 years of age, children's cognitive ability matures and the rules they follow are understood within the context of community life. Children understand that the rules can be modified "by legal channels" if everyone agrees to change the rules (Singer & Revenson, 1996). Moral maturity is the internalization of the principles: that is, the desire to weigh all of the relationships and circumstances before making a decision.

Kohlberg's Theory of Moral Development. Lawrence Kohlberg (1927–1987) expanded on Piaget's moral developmental theory. From a series of moral dilemmas presented to boys aged 10, 13, and 16 years, he identified six stages of moral development occurring at three levels (Kohlberg, 1981; Table 21-3). Kohlberg found a link between moral development and Piaget's cognitive development theory. He theorized that a child's moral development does not advance if the child's cognitive development does not also mature. In this way, **Kohlberg's theory of moral development** follows Piaget's cognitive developmental theory. According to Kohlberg, levels and stages do not occur at specific ages, and people attain different levels of moral development.

Kohlberg's Critics. Although Kohlberg is recognized as a leader in moral developmental theory, critics have questioned the applicability of his study beyond the study population of male adolescents of the Western philosophical tradition.

Research attempting to support Kohlberg's (1981) theory with people raised in the Eastern philosophies found that those study participants never proceeded beyond stages 3 or 4 of Kohlberg's model. Does that mean that they have not reached as high a level of moral development as most of the adults raised in the Western traditions? Or is it that Kohlberg's research design did not allow a way to measure moral development in people raised within a different culture?

Kohlberg's (1981) study has also been criticized for age and gender biases. Gilligan (1982), an associate, concentrated on the differences in Kohlberg's findings that could have been related to gender. According to Gilligan, all developmental theories are subject to gender bias, and only since the 1990s have scholars researched and recognized the differences between men and women in the way they think and how they have been raised to make decisions (Kail, 2002).

Gilligan's Theory. Carol Gilligan (1936–present) proposed that Kohlberg's (1981) theory is biased in favour of men. She believed that men and women develop in parallel ways, with one not being superior to the other. Gilligan's argument is basically that the developmental difference between women and men is in relationships and issues of dependency (Berk, 2006; Crain, 2005; Gilligan, 1982). Separation and individuation are critically tied to male development. **Separation** refers to the boy's recognition of biological distinctness and is based on his emergence from a dependent relationship with his mother. This separation from the mother is essential for the boy in his development of masculinity. Girls do not need to separate from their mothers to achieve feminine identity; it is through this attachment to their mother that their identity is formed. In most developmental theories, the achievement of increasing separation is a developmental norm. When women are measured against this norm as it relates to their need to maintain relationships, they are seen as failures or as less evolved developmentally. **Individuation** is based on the child's awareness of differences in will, viewpoint, and needs. This process enables the individual to gradually assume a more independent role and identity.

Male moral development may focus on logic, justice, and social organization, whereas female moral development focuses on interpersonal relationships. Of interest is that in studies whose research design is based on Gilligan's critique, findings have been inconclusive. As a result, Gilligan's position remains controversial (Cavanaugh & Blanchard-Fields, 2006).

Psychoanalytic and Psychosocial Tradition

Theories in the **psychoanalytic and psychosocial tradition** describe the development of personality, thinking, behaviour, and emotions. This development is thought to occur with varying degrees of influence from internal biological forces and external societal and cultural forces.

Sigmund Freud

The first scholar to provide a formal, structured theory of personality development was Sigmund Freud (1856–1939). His goal was to promote successful participation in society through the development of balance between pleasure-seeking drives and societal pressures. In **Freud's psychoanalytic model of personality development**, he asserted that mature adults should have a strong sense of conscience that allows for the experience of pleasure within the boundaries of society. He

► TABLE 21-3 Kohlberg's Moral Development Theory

Level and Stage	Description	Nursing Implications
Level I: Preconventional level	The person reflects on moral reasoning based on personal gain. The person's moral reason for acting, the "why," relates to the consequences that the person believes will occur. These consequences can occur in the form of punishment or reward. Therefore, children may view illness as a punishment for fighting with their siblings or disobeying their parents.	As a nurse, you should be aware of this thinking and reinforce teaching that the child cannot become ill because of wrongdoing.
Stage 1: Punishment and obedience orientation	Response to a moral dilemma is in terms of absolute obedience to authority and rules. Avoidance of punishment or the unquestioning deference to authority is characteristic behaviour. The child will do something because an authority figure tells him or her to do it.	
Stage 2: Instrumental relativist orientation	The person recognizes that more than one view may be correct. The decision to do something morally correct is based on satisfying one's own needs and occasionally the needs of others.	
Level II: Conventional level	The person sees moral reasoning based on his or her own personal internalization of societal and others' expectations. A person wants to fulfill the expectations of the family, group, or nation; develop loyalty to the dominant order; and actively maintain, support, and justify the order. Moral decision making at this level moves from "What's in it for me?" to "How will it affect my relationships with others?"	You may observe this level of moral development when family members make end-of-life decisions for their loved ones. Grief support will involve an understanding of the level of moral decision making of each family member (see Chapter 28).
Stage 3: Good boy–nice girl orientation	The individual wants to please others and win approval by "being nice," which means having good motives, showing concern for others, and keeping mutual relationships through trust, loyalty, respect, and gratitude.	
Stage 4: Society-maintaining orientation	Focus expands from relationships with others to societal concerns. Correct behaviour is doing one's duty, showing respect for authority, and maintaining the social order. Adolescents in this stage may choose not to attend a party at which drugs will be used, not because they are afraid of getting caught but because they know that using drugs is not healthy.	
Level III: Postconventional level	The person finds a balance between basic human rights and obligations and societal rules and regulations. Individuals reject moral decisions based on authority or conformity to groups in favour of defining their own moral values and principles. Individuals at this stage start to envision an ideal society.	You focus not only on your individual practice but also on social determinants that affect the well-being of a community, such as poverty and homelessness.
Stage 5: Social contract orientation	An individual follows the laws but recognizes the possibility of changing the law to improve society. The individual also recognizes that different social groups may have different values but believe in basic rights, such as liberty and life.	
Stage 6: Universal ethical principle orientation	"Right" is defined by the decision of conscience in accord with self-chosen ethical principles. These principles, such as the Golden Rule, are abstract and appeal to logical comprehensiveness, universality, and consistency (Kohlberg, 1981). Whereas stage 5 emphasizes the basic rights and the democratic process, stage 6 defines the principles by which agreements will be most just.	

believed that two internal biological forces essentially drive psychological change in the child: sexual (**libido**) and aggressive energies. Motivation for behaviour is to achieve pleasure and avoid pain created by these forces. These forces come into conflict with the reality of the world as maturational changes occur.

Freud's theory accounts for five psychosexual developmental stages, each associated with different pleasurable zones that serve as the foci for gratification and bodily pleasure (Berk, 2006; Kliegman et al., 2007; Table 21-4). Freud's theory has been soundly criticized for gender and cultural biases and for an extreme focus on sexuality in development. Freud's critics contend that people are more influenced by their life experiences than by their sexual energies. Despite these criticisms, Freud provided a basis for observation of emotion,

behaviour, and sexuality that has been very influential in the development of many other psychoanalytic theories. Indeed, many agree that development is an ongoing process of resolving conflict between issues of biological maturation and societal expectations.

Mechanisms of Freud's Theory. Components of personality emerge through Freud's developmental stages. The mechanisms of Freud's personality development theory are the **id**, the **ego**, and the **superego**. Freud believed that the functions of these mechanisms regulate behaviour. The **id**—basic instinctual impulses and drives to achieve pleasure—is the most primitive part of the personality and originates in the infant. The **ego** represents the reality mechanism mediating conflicts between the environment and the forces of the **id**. The **ego** helps us judge reality accurately, regulate impulses, and

▶ TABLE 21-4 Freud's Five Stages of Psychosexual Development

Stage	Description	Nursing Implications
Stage 1: Oral (birth to age 12–18 months)	Initially, sucking and oral satisfaction is not only necessary for living but also extremely pleasurable in its own right. Late in this stage, the infant begins to realize that the mother or parent is something separate from self. Disruption in the physical or emotional availability of the parent (e.g., inadequate bonding or chronic illness) could have an impact on the infant's development.	For an infant, feeding and sucking produces pleasure and comfort and promotes self-regulation. Teach parents that feedings should be offered whenever the infant requires them. As well, encourage parents to help their infants self-soothe by making the infant's hands available for sucking.
Stage 2: Anal (ages 12–18 months to 3 years)	The focus of pleasure changes to the anal zone. Children become increasingly aware of the pleasurable sensations of this body region with interest in the products of their effort. Through the toilet-training process, the child is asked to delay gratification in order to meet parental and societal expectations.	Teach the parents that toilet training should be as positive an experience as possible. Praise helps the child achieve a sense of control. Development is not always a smooth, uninterrupted process of moving forward to more advanced stages. Teach parents to understand that successes are often accompanied by failures in the normal progression of development. Assure parents that a child's identifying with the parent of the same sex is a normal developmental phase.
Stage 3: Phallic or Oedipal (ages 3–6 years)	The genital organs become the focus of pleasure. The boy becomes interested in the penis; the girl becomes aware of the absence of the penis, known as <i>penis envy</i> . This is the time of exploration and imagination as the child fantasizes about the parent of the opposite sex as his or her first love interest, known as the <i>Oedipal complex</i> (in boys) or <i>Electra complex</i> (in girls). By the end of this stage, the child attempts to reduce this conflict by identifying with the parent of the same sex in a way to win recognition and acceptance.	Encourage the child to pursue physical and intellectual challenges that will provide opportunities to explore and develop abilities and competencies.
Stage 4: Latency (ages 6–12 years)	Sexual urges from the earlier Oedipal stage are repressed and channelled into productive activities that are socially acceptable. Within the educational and social worlds of the child, much is to be learned and accomplished. The child places energy and effort into these worlds.	Educate parents that the child needs to be encouraged to be independent and make his or her own decisions, within safe limits. Help parents to empathize and identify with their growing adolescent. As parent-child conflicts associated with increasing adolescent independence arise, empathy will help the parent to understand the adolescent's point of view.
Stage 5: Genital (puberty through adulthood)	This is a time of turbulence when earlier sexual urges reawaken and are directed toward an individual outside the family circle. Unresolved prior conflicts surface during adolescence. Once conflicts are resolved, the individual is then capable of having a mature adult sexual relationship.	

make good decisions. The third mechanism, the **superego**, performs regulating, restraining, and prohibiting actions. Often referred to as the *conscience*, the superego is influenced by the standards of outside social forces (parent, teacher).

Nursing Implications of Freud's Theory. The functions of the id, ego, and superego form the historical basis of many, if not all, subsequent theories of personality and social emotional development. You need to remember that according to Freudian theory, mature human personality is the product of conflict between instinctual drives to achieve pleasure and the restraints of adaptive human society. When activities associated with basic pleasure (e.g., eating, sexual activity, and elimination) are altered by illness or disability, knowledgeable and empathetic nursing care is required.

Erikson's Theory of Eight Stages of Life

Erik Erikson (1902–1994) expanded Freud's psychoanalytic stages into a psychosocial model that covered the whole lifespan, not just childhood and adolescence (Erikson, 1993, 1997; Kliegman et al., 2007). He broadened the factors responsible for influencing development to include socialization.

According to **Erikson's theory of eight stages of life**, each person goes through eight stages of development (Table 21-5). In each stage, the person needs to accomplish a particular task before moving on to the next stage. Each task is framed with opposing conflicts that the person must balance. For example, an adolescent needs to develop a sense of personal identity despite many conflicting societal choices (stage 5, identity versus role confusion). Each stage builds upon the successful resolution of the previous developmental conflict. Readiness for the task is necessary for success. Once mastered, tasks are challenged and tested during new situations or at times of conflict (Hockenberry & Wilson, 2007). For example, the infant's trust is built through consistent, reliable caregiving, and the concept of trust is tested when an infant is hospitalized or after the birth of a new sibling.

Mechanisms of Erikson's Theory. *Maturation* and *ego* activity are the primary mechanisms of development in Erikson's theory of eight stages of life. The ego mediates the conflicts between the biological needs and societal norms, and maturation establishes the timeline of this mediation. The developmental result of these mechanisms is described as an

► **TABLE 21-5** Erikson's Theory of Eight Stages of Life

Stage	Description	Nursing Implications
1. Trust versus mistrust (infancy: birth to age 1 year)	The infant learns to trust others. Trust is achieved when the infant will let the caregiver out of sight without undue distress. Key to this stage is consistent caregiving. The question answered at this stage is "Can I trust the world?"	The parent's struggle with building competence can be assisted by your use of anticipatory guidance and other educative interventions. The parent may need guidance to understand the importance of a safe, nurturing environment when meeting the child's needs.
2. Autonomy versus sense of shame and doubt (toddler years: ages 1–3 years)	The toddler learns to be independent and develops self-confidence. Not learning independence creates feelings of shame and self-doubt. Independence is accomplished through self-care activities, including walking, feeding, and toileting. Toddlers also develop autonomy by making choices. The question answered at this stage is "Can I control my own behaviour?"	Nurses can use empathetic guidance to offer support for and understanding of the challenges of this stage. Parents can be taught to use nonviolent disciplinary methods with their children that promote safety, yet discipline. Teach parents to offer children a limited number of choices, so as not to overwhelm, but to promote children's developing sense of self-efficacy and competence.
3. Initiative versus guilt (preschool years: ages 3–6 years)	The child learns to initiate his or her activities. Accomplishing this task teaches the child to seek challenges in later life. Children use fantasy and imagination to explore their environment. Conflicts often arise between the child's desire to explore and the limits placed on his or her behaviour. These conflicts may lead to feelings of frustration and guilt. The question answered during this stage is "Can I become independent of my parents and explore my limits?"	Teaching impulse control and cooperative behaviours to the child are necessary at this stage. Children can be shown appreciation for independent behaviours that demonstrate prosocial skills such as sharing, kindness to others, and helping with household chores.
4. Industry versus inferiority (middle childhood: ages 6–11 years)	The child develops a sense of competence in physical, cognitive, and social areas. Not learning new skills may lead to a sense of inadequacy and inferiority. Successfully achieving this task leads to positive attitudes toward work in adulthood (Erikson, 1993). The question answered at this stage is "Can I master the skills necessary to survive and adapt?"	You can encourage parents to offer the child many opportunities to pursue new interests and challenges in extracurricular activities such as sports, music, and art.
5. Identity versus role confusion (adolescence: ages 12–18 years)	The task of adolescence is to try out several roles and form a unique identity. Dramatic physiological changes associated with sexual maturation also mark this stage. Acquiring a sense of identity is essential for making later adult decisions such as vocation or marriage partner. New social demands, opportunities, and conflicts arise in relation to the emergent identity and separation from family. The question answered at this stage is "Who am I, and what are my beliefs, feelings, and attitudes?"	You can provide education and anticipatory guidance for the parent about the changes in and challenges to the adolescent. You can also assist hospitalized adolescents in dealing with their illness by giving them enough information to allow them to make decisions about their treatment plan.
6. Intimacy versus isolation (young adulthood: ages 18–35 years)	The primary task of young adulthood is to form close, personal relationships. This is the time to become fully active in the community. If young adults have not achieved a sense of personal identity, they may be unable to form meaningful attachments, and they experience feelings of isolation. The question answered during this stage is "Can I give of myself fully to another?"	Understand that during hospitalization, young adults may benefit from the support of their partners or significant others because this support helps fulfill their need for intimacy.
7. Generativity versus self-absorption and stagnation (middle adulthood: ages 35–65 years)	The task of middle adulthood is to help younger people. The ability to expand one's personal and social involvement is crucial for this stage of development. Middle-aged adults should be able to see beyond their needs and accomplishments and view the needs of society. Dissatisfaction with one's achievements often leads to self-absorption and stagnation. The question answered during this stage is "What can I offer succeeding generations?"	You can assist adults in choosing creative ways to foster social development. Middle-aged people may find a sense of fulfillment from volunteering some time in a local school, hospital, or place of worship.
8. Integrity versus despair (old age: age 65 years and older)	Older adults reflect on their life and feel satisfaction or disappointment. By suffering physical and social losses, such as those through retirement or illness, the adult may also suffer loss of status and function. The person may also have internal struggles, such as the search for meaning in life. Meeting these challenges creates the potential for growth and wisdom (Figure 21-3). The question answered during this stage is "Has my life been worthwhile?"	You can contribute to the valuing of people at all ages and stages in their communities. For example, by promoting older adults' involvement in volunteer activities, such as youth mentoring, that you display value for the skills and experience of older people, and such mentoring helps the younger generation feel important.



Figure 21-3 Maintaining independence is important to a person's self-esteem.

epigenesis (successive gradual change). If the process is adaptive, then a person has successive positive outcomes.

Nursing Implications of Erikson's Theory. The theory of the eight stages of life implies that the quality of early developmental work is important. For instance, children who live in environments in which violence is common and trust has not been attained are at greater risk of experiencing poor intimate relationships. The mechanism of epigenesis implies that the original required trust elements cannot be retrieved; at best, such a person can learn only to live with the fear and anger associated with this mistrust. You therefore need to practice within the health promotion model to build the familial, community, and societal supports necessary for growing, vulnerable children to achieve successful transitions at each stage (e.g., trust, autonomy, initiative).

John Bowlby

John Bowlby (1907–1990) was a child psychiatrist interested in children's mental health. According to **Bowlby's attachment and separation theory**, the conflict between attachment and separation needs to be resolved to produce healthy social and emotional developmental outcomes across the lifespan. **Attachment** means a bond or tie between an individual and another person, such as a parent or caregiver. A basic premise of the theory is that the quality of attachment relationships stems from interactions between infants and caregivers. These interactions reflect the degree to which infants can rely on their caregivers to provide proximity and companionship, a safe haven in the presence of threat or anxiety, and a secure base from which to explore. Failure to achieve secure attachment results in an inability throughout the lifespan to separate from

BOX 21-2 NURSING STORY

Jonathan is five years old. His mother has brought him to the pediatrician at the advice of his kindergarten teacher. You are the clinic nurse, charged with taking Jonathan's history. His mother removes Jonathan's winter coat and collects his mittens. She takes time to locate crayons and paper for Jonathan during the office visit. However, Jonathan does not settle for long. As you begin your assessment, you observe Jonny, as she calls him, spend a minute with the crayons before breaking one and then moving on to examine the stethoscope and then the next item in the office that intrigues him more. Jonny rips the paper and his mother makes no move to correct him. He smiles at you and seems content to move chaotically about in the office.

As you proceed through your assessment, you learn that Jonny accomplished typical milestones (walking, talking, toilet training) on time and had a few ear infections but no other physical health problems. His weight and height are normal. He gets along well with the other kids, except for the occasional skirmish over a toy. His mother notes that he does not sit still for very long, but, she says, Jonny loves to be read to and can curl up for half an hour easily during story time with her. The mother tells you that since her military husband was deployed three months ago, she rarely has individual time for Jonny or her other children. His dad could "make him mind" and so since his dad's deployment, she has given up on trying to make him sit still in church, leaving him instead in a supervised playroom. She adds that her kids miss their dad but Jonny's older siblings grew accustomed to his absences over time. As she begins to talk about Jonny's dad, Jonny climbs into his mother's lap and starts playing a shooting game with a car on the counter. Jonny's mom gently "shoo's" him away. Jonny slides to the floor but returns with a book held out to his mother. She says, "Sorry, not now, Jonny," and tells you the teacher's concern about his activity level, inability to hold a pencil properly, and failure to pay attention to learning tasks in class. The mother relays the teacher's concern that he may have attention deficit-hyperactivity disorder. You wonder whether Jonny's activity level has anything to do with his father's deployment (separation from his dad) and the decreased time that Jonny's mother has for him (separation anxiety and lack of secure base). The mother wonders whether medication would help Jonny have an easier time in kindergarten, and she asks you for your opinion.

caregivers and reconnect to new relationships (including work, friendship, and intimate relationships) in a healthy way.

Mechanisms of Bowlby's Theory. Early in life, two complementary behavioural systems, attachment and caregiving, combine into a self-regulating system that supports people in their healthy attachments to and separations from others. The child's experiences within this self-regulating system cause the child to develop a cognitive working model (or "map") of self, other, and the relationship between them. The ability to regulate emotion and behaviour (Box 21-2) are influenced by this working model at each developmental stage throughout life.

Patricia Crittenden

Psychologist Patricia Crittenden (1945–present) was heavily influenced by the work of attachment theorists Bowlby and Ainsworth (1979) in developing her **dynamic maturational model of attachment** (Crittenden, 2008; Crittenden & Claussen, 2003). In this model, behavioural and psychiatric developmental disorders are considered within the context of family

attachment relationships. Unlike the previous work of attachment theorists, the model considers the impact of intimate relationships on development over the lifespan.

Mechanisms of the Dynamic Maturational Model.

The interaction between brain development and experiences with caregivers is central in the development of self-protective strategies that individuals use over their lifespan (Box 21-3).

BOX 21-3 RESEARCH HIGHLIGHT

Toxic Stress and Development

In response to stressors such as difficult and challenging experiences, humans physiologically respond by increasing the capacity to think and act. Energy stores are mobilized and heart rate and blood pressure are increased to enable more attention, awareness, and responsiveness to the environment. When stress is controllable, short-lived, and predictable, it can help us learn to be adaptive and resilient. This is a good form of stress. Some forms of stress are tolerable even though they challenge our abilities to cope. The death of a loved one or moving to a new city are examples of inevitable forms of adverse events that are made tolerable by support from our social network and by the fact that many other people have faced similar experiences. But what if the challenges we face are uncontrollable, unpredictable, and pervasive? This is toxic stress.

Toxic stress is a form of stress that results in chronic activation of the biological stress response system with harmful consequences for child development. Experiences that are chronically disruptive, abusive, neglectful, or unpredictable flood the brain with chemicals that, in large persistent doses, impair neuronal growth and ultimately make it harder for the brain to form healthy connections. In this way, toxic stress leaves a lasting biological fingerprint of damage on brain structure and function.

For example, parents suffering from mental illness, addictions to substances of abuse, or domestic violence are less able to respond sensitively to their infants to meet their needs, placing the infants at risk for unpredictable, neglectful, or abusive parenting. As infants are completely reliant on their parents to have their basic needs met, these situations chronically activate infants' stress systems and produce changes to the structure and function of some brain regions.

Two major brain regions that are known to be affected by toxic stress are the hippocampus and the prefrontal cortex. These brain regions are particularly important to the development of memory and self-regulation—the foundations of school and social success. Over time, the effects of toxic stress on brain structure and function can lead to shifts in patterns of behaviour from more organized to more habitual with the result that children become more rigid and less capable of independent problem solving.

The effects of toxic stress are particularly worrisome in early childhood because the brain is exquisitely sensitive to experience during this phase of rapid brain development. As well, children's future brain development builds upon current and past brain development. Thus, changes in brain structure and function due to toxic stress produce cumulative changes—affecting not only current aspects of development for a given stage, but also the next stage that builds upon previous growth. To summarize, it seems that the common adage “what doesn't kill you will make you stronger” is true of good stress but when it comes to toxic stress “what doesn't kill you now may kill you later.”

Reference: Letourneau, N., & Giesbrecht, G. (2011). Toxic stress in early caregiving and child health. *DMM News*, 11, 1–2.



Attachment strategies are employed to promote safety and security in relationships (Crittenden & Claussen, 2003; Crittenden & Landini, 2011). Patterns of attachment are dominated by “cognitive” and “affective” strategies and may be categorized as types A and C, respectively. People with type A patterns tend to minimize awareness of negative feelings, compulsively perform what they expect will be reinforced, and avoid doing what will be punished (Crittenden & DiLalla, 1988). People with type C patterns rely on feelings as guides to behaviour because they lack confidence in what will happen next. When familial relationships fail to protect the child (or adult parent), type A and type C coping strategies become more extreme. For example, a child reared by an unresponsive caregiver may learn that “acting out” elicits a needed response from the caregiver. As the child grows and becomes an adult, he or she may seek attention by extreme emotional outbursts, acting coercively or aggressively in other adult relationship (type C) (Crittenden & Kulbotten, 2007). Another pattern, type B, is characterized by a tendency to use a balance of type A and type C strategies.

Nursing Implications of the Dynamic Maturational Model. You need to design approaches that address both the quality of the attachment system and the caregiving system. Crittenden (2008) asserted that recognizing patients' attachment strategies is crucial for providing helpful treatments and reducing the risk of inappropriate treatment. For instance, in the situation in which a young child is hospitalized, you would need to consider the security of the child and to provide high-quality substitute care, including making developmentally appropriate efforts to keep the child attached to his or her primary caregiver (e.g., using pictures, phone calls, liberal visiting hours, parent sleepovers). If you are working in mental health care, you need to recognize that patients' apparently maladaptive coping strategies (e.g., obsessive-compulsive disorder, anxiety) may be strategies developed to cope with adverse relationships with attachment figures. Alternatively, in working with parents in impoverished environments, you need to support the caregivers through the provision of material, social, and educational resources that will promote safety and security of both adults and children. You need to advocate for appropriate support resources for families in which caregiving may be compromised as a result of stress associated with parental poverty, mental illness, or lack of education (Middlebrooks & Audage, 2008; Mustard, 2006).

Havighurst's Developmental Tasks

Robert Havighurst (1900–1991) was influenced by Erikson's work and observations of the developmental tasks crucial for healthy development. Havighurst defined a series of age-specific essential tasks, such as learning to walk, getting ready to read, learning social and gender roles, developing independence, selecting a mate, rearing children, and, finally, adjusting to decreasing physical strength and health. The essential tasks arise from predictable internal and external pressures, such as increasing physical maturity, cultural pressure of society, and the individual's personal goals and aspirations.

According to Havighurst's developmental tasks, several sources of pressure may be present at the same time. Increasing physical maturity is associated with the development of skills such as walking, talking, or eating. Cultural pressure creates the conditions necessary to learn social behaviours and ethical norms. An adolescent girl may be physically able to bear a child, but the preparation and timing for the onset of

► TABLE 21-6 Developmental Theorists for Adult Stages

Adult Stages	Erikson's Description	Havighurst's Description
Early-early adult (ages 16–22 years)	Intimacy versus isolation	Early adulthood stage
Middle-early adult (ages 22–28 years)	Ability to form intimate relationships	Selecting a mate Learning to live with a marriage partner Starting a family Rearing children Getting started in an occupation Taking on civic responsibilities Finding a congenial social group
Early-middle adult (ages 28–45 years)	Generativity versus self-absorption and stagnation Ability to expand personal and social involvement	Middle age Assisting teenage children to become responsible adults Achieving adult social and civic responsibility Reaching and maintaining satisfactory performance in one's occupation Developing adult leisure-time activities Relating to one's spouse as a person Accepting and adjusting to the physiological changes of middle age Adjusting to aging of parents
Late adult–old age (age 45 years and older)	Integrity versus despair, disgust Ability to adapt to changes in lifestyle, functional level, and family structure	Later maturity Adjusting to decreasing physical strength and health Adjusting to retirement and reduced income Adjusting to death of a spouse Establishing an affiliation with one's age group Adopting and adapting social roles in a flexible way Satisfactory physical living space

parenthood can also be considered from a perspective of pressure from both the youth and adult cultures.

Havighurst believed that at certain critical periods, the individual is most receptive to the learning necessary to achieve success in performing these tasks. Effective learning and achievement of tasks during one period lead to happiness and success with later tasks. Failure leads to unhappiness, disapproval by society, and difficulty with later tasks. An example is the struggle that adolescents might experience in preparing for a work career after having failed to develop fundamental skills in reading and math.

Havighurst's theory is limited in its cultural application, according to critics who believe that it describes developmental milestones from the perspective of middle-class norms within the United States. It would be difficult to fit all cultural or ethnic mores within this theoretical framework.

Mechanisms and Nursing Implications of Havighurst's Theory. Havighurst's work built on that of Freud and Erikson. Therefore, the mechanisms and nursing implications from Freud and Erikson also apply to Havighurst's developmental tasks (Table 21-6).

Mechanistic Tradition

According to the **mechanistic tradition**, the organism is similar to a machine. Development depends on the level of stimulation, the kind of stimulation, and the history of stimulation from the environment. The environment is considered to activate human development (Bornstein & Lamb, 1999), and behaviour is seen as responsive to environmental forces rather than driven only by internal causes such as maturation. Social learning theory follows from this tradition and is presented in Chapter 20.

Contextualism

The way that human development is described and explained is increasingly tied to the understanding of environment and context. Developmental theories within the **contextual tradition** focus on the relationship between the individual and his or her social context. Within this tradition, the individual and the environment are viewed as mutually influential, acting on one another in dynamic interaction (Bornstein & Lamb, 1999). Human development is the process of continuously adapting to changing environments.

Bioecological Theory

Urie Bronfenbrenner (1917–2005), a developmental psychologist at Cornell University, developed a theory that stresses the importance of the interaction between the developing individual and his or her surrounding social environments. **Bronfenbrenner's bioecological theory** involves considering multiple “layers” of the environment:

- The **microsystem** consists of the immediate settings, activities, and personal relationships of the individual. Examples are family, classroom, workplace, and recreation group.
- The **mesosystem** is made up of the relationships between the different settings in which the person spends time. Examples are relationships between families and schools, between workplaces and schools, and between families and spiritual organizations (church parish, mosque, temple), and spiritual organizations and schools.
- The **exosystem** is a set of specific social structures that do not directly contain the individual but exert direct and indirect influence on individual development. Examples are the health care system, the education system, the justice system, and religious institutions.

- The **macrosystem** consists of all of the elements contained in the individual's microsystem, mesosystem, and exosystem, as well as the general underlying philosophy, cultural orientation, and values by which the person lives (Salkind, 2004). Examples are overarching dimensions such as political orientation, economic model, and cultural values.

Mechanisms of the Bioecological Theory. Lev Semenovich Vygotsky (1896–1934) introduced a concept called the **zone of proximal development**, which is the key developmental mechanism of ecological theories. This zone is the space between the individual's potential and his or her actual developmental status. For instance, a toddler may have a 10-word vocabulary but potentially could have a repertoire of hundreds of words. Activity that links those two states promotes development. For instance, parents who use joint referencing (looking at things that their toddlers are looking at and naming them) promote toddler vocabulary development within the zone of proximal development.

Bronfenbrenner's modern conception of developmental processes expands upon Vygotsky's idea of the zone of proximal development. In language acquisition, developmental support processes occur in all levels of the system. At the macrosystem level, a process supporting language development in young children would be the adoption of a national child care policy to support working parents. Such a policy would inform regulations concerning issues such as education level of child care workers, ratio of children to workers in child care centres, and space requirements per child.

Nursing Implications of the Bioecological Theory.

An appropriate goal of nursing practice is to influence wellness by promoting health in all layers of the bioecological system. The ecological model applies to nursing practice beyond the individual level of health promotion to higher levels of the social context. Therefore, Bronfenbrenner's theory fits well with the current emphasis on primary health care (Box 21-4).

Dialecticism

In the **dialectic tradition**, all developmental theories are considered mutually interactive. Developmental theorists are increasingly proposing that change or development can occur within the framework of multiple theories. A key element of the dialectic tradition is the ability to incorporate multiple contexts. An example of a dialectic approach from the biomedical sciences is the theory of gene expression. The theory of gene expression links genetics, the environment, and their influences on human behaviour and disease. In the human development disciplines, examples of dialectical thinking include the growing awareness of the effect of the economic environment on human development at the population level. Resilience theory is an approach in which the interaction between two processes, previously studied separately, is examined.

Keating and Hertzman's Population Health Theory

Human development has historically been considered an individual characteristic. According to Daniel P. Keating (1949–present) and Clyde Hertzman's (1953–present) **population health approach**, human development is a population phenomenon. These Canadian developmental theorists referred to the strong association between the health of a population, developmental outcomes, and the social and economic forces affecting the larger society. They based their developmental

*** BOX 21-4**

FOCUS ON PRIMARY HEALTH CARE

Bronfenbrenner's Ecological Theory and Primary Health Care

Three principles of primary health care are to (1) foster public participation, (2) educate the patient in order to promote health and prevent illness, and (3) foster intersectoral collaboration. Bronfenbrenner's ecological model of human development fits well with these principles. At each environmental layer, nurses can initiate actions to promote health:

- **Microsystem**, which includes the individual and his or her immediate setting (e.g., family, school, workplace, neighbourhood). You can help the individual develop personal skills, healthy lifestyles and activities, and supportive environments. For example, you can help teach family members caring for an elderly parent how to balance family care and self-care to keep themselves healthy.
- **Mesosystem**, which consists of relations among the individual's various immediate settings. To strengthen the mesosystem, you can work toward strengthening community action. You can link the family to community supports such as adult respite services and older adults' activities groups.
- **Exosystem**, which comprises relations among structures, sectors, services, and policies. The exosystem is strengthened when nurses promote healthy public policy. You are practising at this level when you help develop links between typically separate services such as the health care system and the social service system. For example, you can volunteer to be on planning committees and other decision-making bodies.
- **Macrosystem**, which consists of societal values. To promote optimum health at the macrosystem level, the nurse can be an advocate for social change. For example, if you believe that more value should be placed on older adults in society, you may advocate for higher standards and staff-to-resident ratios in long-term care facilities. Such advocacy might include writing letters to the editor, joining community or national advocacy groups, and lobbying politicians.



theory on epidemiological evidence that improved literacy (one marker of human development) is related to improvements in family economic status, in school community economic status, and in national economic status (Hertzman, 2011).

Keating and Hertzman (1999) proposed that health, behaviour, and cognitive functions are largely set in early life and are then influenced further by succeeding events in the socioeconomic environment. **Developmental health** is defined as the physical and mental health, well-being, coping, and competence of human populations. Developmental health is primarily a function of the overall quality of the social environment, including the national socioeconomic environment, civil society, and social network. Keating and Hertzman's population approach to human development is outlined in Figure 21-4.

Mechanisms of the Population Health Theory.

Keating and Hertzman (1999) proposed three interrelated regulatory systems as the mechanisms for human population development: emotional regulation, attention regulation, and social regulation. Each regulatory system develops in interaction between the individual's biological processes and his or

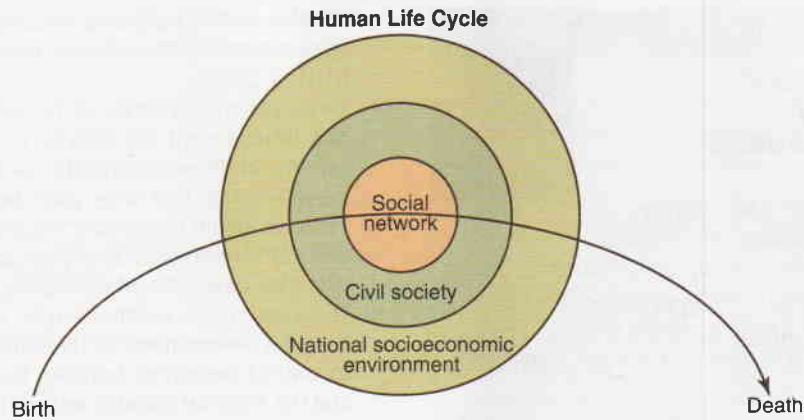


Figure 21-4 Framework for human development and the social determinants of health. **Source:** Redrawn from Keating, D. P., & Hertzman, C. (Eds.). (1999). *Developmental health and the wealth of nations: Social, biological and educational dynamics* (p. 30). New York: Guilford Press.

her multiple socioeconomic environments. *Emotional regulation*, which involves the modulation of emotional reactions, plays an important role in competent social functioning. *Attention regulation*, which involves regulation of arousal and reactivity of the brain, contributes to the ability to pursue goals and respond to challenges to those goals. *Social regulation* involves regulation of social interactions, including aspects such as mutual affection and warmth, particularly in nurturing relationships. Together, these three regulatory systems are thought to influence later competence as individuals interact reciprocally with their socioeconomic environments.

Nursing Implications of the Population Health Theory. Nurses have typically focused on the health and well-being of patients. To promote well-being, health providers need to implement practices that take into account the impact of the socioeconomic context on the health of the individuals in society. The ecological levels of health promotion activities are directly applicable to the population health approach. A population health approach helps identify these socioeconomic factors and provides direction for designing nursing interventions that address them.

Resilience Theory

Resilience is defined as the maintenance of positive adjustment under challenging life conditions (Cicchetti & Curtis, 2007). This approach arose in the field of child psychiatry when clinicians observed that some children and adolescents were able to thrive in severely adverse conditions (e.g., poverty, maternal depression, and paternal criminality), whereas others faltered (Luthar, 2003).

Mechanisms of Resilience. Resilience theory focuses on the interaction between protective processes and vulnerability processes. **Vulnerability processes** (physical illness, psychological stresses, social risk) and **protective processes** (self-efficacy, good parenting and problem solving, social support acquisition and maintenance) are examined together to understand and explain human growth and development. Individual factors found to promote resilience include self-efficacy, positive attitude, literacy, social competence, and a history of success. Family-level processes that protect from adversity include coherent response to crisis, social supports, stability, flexibility, effective parenting, and responsibilities outside the home (Rutter, 2005). Community-level processes

that promote resilience include control over policy, collaborative and cooperative organization, widespread citizen participation in community, and volunteerism.

Resilience and family adaptation theory has been used to design interventions to support children and families at risk, focusing on protective processes within the context of key risk situations, usually defined by factors such as poverty, chronic illness, and civil conflict. This emphasis is a progression from the previous emphasis on only pathological processes, but the challenge is to design research that enables scholars to study both protective processes and vulnerability processes as they occur together.

Nursing Implications of Resilience. The focus of nursing practice is directly on the individual, family, and community factors that promote health. Nursing practice is usually used in situations that are stressful and challenging for individuals and families, such as illness and loss. Resilience theorists acknowledge the complexity of these moments and ask what nurses can use from these challenging situations that help the family succeed (Box 21-5). For example, a young single woman dealing with the birth of her first child will benefit from nursing interventions that focus both on protective processes (linking to support group, learning parenting skills) and on vulnerability processes (ensuring adequate health care, arranging for financial support).

Developmental Theories and Nursing

The diverse set of theories included in this chapter suggest that human behaviour is truly complex. No single theory successfully describes human growth and development in all its complexity. Theorists demonstrate their own values and beliefs in their focus and the subjects chosen for their work, and they work within cultural and historical perspectives. The theories described in this chapter are meant to provide the basis for meaningful thought and observation of an individual's pattern of growth and development and the role of environments in it. This observation and reflection provide you with a framework within which you can predict human responses to health and illness and recognize deviations from the norm.

Patterns of growth and development help determine future patterns of adjustment to life (Edelman & Mandle, 2006). A clear understanding of these patterns and of the contexts

BOX 21-5 RESEARCH HIGHLIGHT

Supporting Parents: Can Intervention Improve Parent-Child Relationships?

Research Focus

Healthy child development has been identified as one of the key determinants of health and resiliency in adulthood. In two studies reported by Letourneau et al. (2001), researchers examined interventions aimed at improving the parent-child relationship and enhancing resiliency among children considered to be at risk because of poverty or parents' young age, inexperience, or lack of education.

Research Abstract

These two pilot studies were randomized control trials designed to test the effects of two support interventions. In the first intervention, Keys to Caregiving, a family-centred approach, was used to provide parents with tools necessary for high-quality interactions with their infants. A post-test experimental design was used to study 16 adolescent mothers and their infants. The second intervention, Natural Teaching Strategies, focused on developing mutually satisfying methods for parents to communicate with their preschoolers. A pretest-post-test design was used to study 29 families of children enrolled in Head Start programs. In both groups, parent-child interactions were enhanced in the treatment groups. Results of both interventions revealed the potential effect of supportive intervention on parent-child interactions over time.

Evidence-Informed Practice

- Helping parents develop realistic expectations of their child's development and improving the quality of parent-child relationships are important support mechanisms for families at risk.
- Parent training and support has the potential to positively alter the style of interactions between parents and children.

Reference: Letourneau, N., Drummond, J., Fleming, D., Kysela, G., McDonald, L., & Stewart, M. (2001). Supporting parents: Can intervention improve parent-child relationships? *Journal of Family Nursing*, 7(2), 159-187.



within which they occur assists you in planning questions for health screening and health history and in health teaching for patients of all ages. You need to consider an individual's development within the context of his or her families, social relationships, communities, and the larger society.

Developmental theories help you use critical thinking skills when you consider how and why people respond as they do. Your assessment of a patient requires a thorough analysis and interpretation of data to form accurate conclusions about a patient's developmental needs. To accurately identify patients' needs, you need the ability to consider developmental theory in data analysis. Typical developmental behaviours are compared with those projected by the developmental theory.

❖ KEY CONCEPTS

- Nurses provide care for individuals and families throughout their lives. Developmental theories provide a basis for nurses to assess, interpret, and understand the responses seen in their patients.
- Development continues throughout life.
- Individuals have unique patterns of growth and development within broad limits.

- Development is not just a series of distinct linear tasks; it is also a process that varies across and within individuals (Hartup, 2002).
- Three major categories of factors influence human growth and development: (1) genetic or natural forces within the person, (2) the environment in which the person lives, and (3) the interaction that takes place between these two.
- Theories within the organic tradition explore how individuals develop when mostly biological components are believed to stimulate developmental progress.
- Theories in the psychoanalytic and psychosocial tradition describe development of the human personality with regard to conflict resolution between the internal biological forces and the external societal and cultural forces.
- According to the mechanistic approach, human development and behaviour are responses to environmental forces rather than driven by internal causes such as maturation.
- Within the contextual tradition, the individual and the environment are viewed as mutually influential, acting on one another in dynamic interaction.
- In the dialectical tradition, the complete complexity of development is acknowledged. Theorists who work in this tradition strive to combine divergent ways of viewing human development.

❖ CRITICAL THINKING EXERCISES

1. A 50-year-old woman is anxious because her children, 20 and 23 years of age, are no longer living at home. Her husband is still working full-time but planning to retire in two years. She is concerned that she is not needed, and she is bored with her life. Identify the developmental task of Erikson's theory that best fits this woman's situation. How will you assist this patient in changing her lifestyle while understanding her developmental tasks?
2. A public health nurse conducting a routine assessment of an 18-month-old is concerned about the child being underweight for his age. Upon further discussion, the father reveals that he is not working at present and the family is having financial troubles. Using your knowledge of Bronfenbrenner's bioecological theory, what approach and subsequent strategies would be helpful for these parents?
3. Two 11-year-old girls are spending the day together at the mall. They exit one store, and one of the girls shows her friend a small purse that she stole from the store. Her friend is upset and wonders how she should respond. Use moral development theory to discuss this issue.
4. A woman visits her nurse practitioner at her local health clinic. The woman is struggling with depression and seeking to increase her medication dosage. She also reveals that she is struggling to cope with her eight-year-old son's problem behaviours, such as refusing to do homework and having tantrums when he fails to get his way. Using the dynamic maturational model of attachment, discuss how her mental health state could be influencing her child's behaviour.

❖ REVIEW QUESTIONS

1. Children generally double their birth weight by five months of age. This is an example of
 1. Development
 2. Heredity
 3. State of health
 4. Physical growth

2. _____ development is the ability of an individual to distinguish right from wrong and to develop ethical values on which to base his or her actions.
 1. Moral
 2. Cognitive
 3. Psychosocial
 4. Psychoanalytic
3. Theories in the _____ tradition hold that development is a result of biology and adaptation.
 1. Organicism
 2. Psychoanalytic and psychosocial
 3. Contextualism
 4. Dialecticism
4. Which of the following factors is considered an environmental factor that affects human development?
 1. Family
 2. Heredity
 3. State of health
 4. Genetics
5. The developmental theorist who believed his/her research described a sequential process that resolved conflict between the internal life (personality) of adults and their outer world (culture) was
 1. Erikson
 2. Crittenden
 3. Freud
 4. Havighurst
6. The zone of proximal development is
 1. The space between the individual's potential and his or her actual developmental status
 2. Where sensitive caregivers should operate to promote development of their young children
 3. A concept described by Vygotsky
 4. All of the above
7. According to Piaget's theory of cognitive development, during what stage does the individual's moral thinking move to abstract and theoretical subjects, such as achieving world peace, finding justice, and seeking meaning in life?
 1. Formal operations
 2. Concrete operations
 3. Sensorimotor
 4. Preoperational
8. The nurse who is working with a school committee to develop playground safety guidelines is focusing on which level of the bioecological model?
 1. Mesosystem
 2. Microsystem
 3. Exosystem
 4. Macrosystem
9. Which of the following nursing interventions is representative of a population health approach?
 1. Parent teaching
 2. Developing a clinical practice guideline
 3. Participating in a community coalition to improve community housing
 4. Assisting an individual in obtaining funding support for home care

10. A resilient individual is able to experience positive development despite challenging life circumstances. For a young single mother with two young children, access to high-quality day care represents the following:
 1. A vulnerability process
 2. A critical period
 3. Attachment
 4. A protective process

✦ RECOMMENDED WEB SITES

Canadian Institute of Child Health: <http://www.cich.ca>

The Canadian Institute of Child Health (CICH) is dedicated to improving the health of children and youth in Canada. Activities include research and policy recommendations and community development and resource building. CICH focuses on four key areas of activity: supporting healthy pregnancy and childbirth, fostering healthy child development, ensuring that the environment is safe for children, and monitoring the state of children's health.

Centre of Excellence for Early Childhood Development: <http://www.excellence-jeunesenfants.ca/home.asp?lang=EN>

The mandate of the Centre of Excellence for Early Childhood Development (CEECD) is to foster the dissemination of scientific knowledge about the social and emotional development of young children and about the policies and services that influence this development. The CEECD also formulates recommendations for the services needed to ensure optimum early childhood development. This page of the CEECD Web site lists a variety of issues and behaviours common to children younger than five years, with links to articles on the subjects written by leading researchers in the field.

Centre for Health Promotion (CHP): <http://www.phac-aspc.gc.ca/chhd-sdsh/index-eng.php>

The CHP uses a life stages approach and is responsible for implementing policies and programs that enhance the conditions conducive to healthy development. The CHP addresses the determinants of health and facilitates successful movement through the life stages. The CHP acts through programs addressing healthy child development, families, aging and lifestyles, public information, and education (Canadian Health Network), as well as on issues related to rural health and support of the voluntary sector.

Nursing Child Assessment Satellite Training (NCAST): <http://www.ncast.org/>

Based in the University of Washington, this organization aims to give professionals, parents, and other caregivers the knowledge and skills to provide nurturing environments for young children. NCAST disseminates and develops research-informed products and training programs for practitioners and researchers in many disciplines and settings, which can be used with typically developing children, with those at risk for developmental delays, and with those in whom special health care needs have been identified.

Review Question Answers

1. 4; 2. 1; 3. 1; 4. 1; 5. 4; 6. 4; 7. 1; 8. 2; 9. 3; 10. 4

Rationales for the Review Questions appear at the end of the book.

Conception Through Adolescence

Original chapter by Karen Balakas, RN, PhD, CNE

Canadian content written by Cynthia Murray, BN, MN, PhD

objectives

Mastery of content in this chapter will enable you to:

- Define the key terms listed.
- Discuss physiological and psychosocial health concerns during the transition of the child from intrauterine to extrauterine life.
- Describe characteristics of physical growth of the fetus and of the child from birth to adolescence.
- Describe cognitive and psychosocial development from birth to adolescence.
- Describe the interactions that occur between parent and child.
- Explain the role of play in the development of the child.
- Identify factors that contribute to self-esteem in youth.
- Describe the influence of the school environment on the development of the child.
- Plan culturally appropriate health promotion activities for children of all backgrounds.
- Discuss ways in which you can help parents meet their children's developmental needs.

evolve WEBSITE

<http://evolve.elsevier.com/Canada/Potter/fundamentals/>

- Audio Chapter Summaries
- Examination Review Questions
- Glossary
- Student Learning Activities
- Weblinks

media resources

key terms

- | | |
|-------------------------------------|--|
| Adolescence, p. 352 | Molding, p. 330 |
| Animism, p. 341 | Morula, p. 327 |
| Apgar score, p. 328 | Nagele's rule, p. 327 |
| Artificialism, p. 341 | Neonatal period, p. 327 |
| Blastocyst, p. 327 | Object permanence, p. 340 |
| Bonding, p. 328 | Organogenesis, p. 328 |
| Classification, p. 348 | Placenta, p. 327 |
| Concrete operations, p. 348 | Prematurity, p. 330 |
| Differentiation, p. 328 | Preoperational thought, p. 340 |
| Embryo, p. 327 | Preschool period, p. 341 |
| Estrogen, p. 352 | Preterm labour, p. 329 |
| Fertilization, p. 327 | Puberty, p. 345 |
| Fetus, p. 328 | Quickening, p. 328 |
| Fontanel, p. 330 | School-age, p. 345 |
| Formal operations, p. 354 | Sensorimotor period, p. 332 |
| Hyperbilirubinemia, p. 332 | Sexually transmitted infections (STIs), p. 357 |
| Immanent justice, p. 341 | Teratogens, p. 329 |
| Implantation, p. 327 | Testosterone, p. 352 |
| Inborn errors of metabolism, p. 332 | Toddlerhood, p. 339 |
| Infancy, p. 332 | Vernix caseosa, p. 328 |
| Lanugo, p. 328 | Zygote, p. 327 |
| Menarche, p. 354 | |

Human growth and development are continuous, intricate, complex processes that are divided into stages organized by age groups. This arbitrary, chronological division is used because it coincides with the timing and sequence of maturational changes that allow children to progress through a series of developmental stages and associated tasks (Box 22-1). This chapter focuses on the various physical, psychosocial, and cognitive changes. It also focuses on health risks and concerns during the various stages of growth and development. Major developmental theories are discussed in Chapter 21.

► BOX 22-1 Developmental Age Periods

Prenatal Period: Conception to Birth

Germinal: Conception to approximately 2 weeks

Embryonic: 2 to 8 weeks

Fetal: 8 to 40 weeks (birth)

Because of rapid growth rate and total dependency, this is one of the most mutable and vulnerable periods in the developmental process. The relationship between maternal health and certain manifestations of normalities and abnormalities in the newborn emphasizes the importance of adequate prenatal care to the health and well-being of the infant.

Infancy Period: Birth to Approximately 12 to 18 Months

Neonatal: Birth to 28 days

Infancy: 1 to approximately 12 to 18 months

The infancy period is one of rapid motor, cognitive, and social development. Through bonding with the parent or other caregiver, the infant establishes a basic trust in the world and the foundation for future interpersonal relationships. The critical first month of life, termed the **neonatal period**, although part of infancy, is often differentiated from the remainder of infancy because it is characterized by major physical adjustments to extrauterine existence and by the psychosocial adjustment of the parents to their new roles.

Early Childhood: 1 to 6 Years

Toddler: 1 to 3 years

Preschooler: 3 to 6 years

This period, which extends from the time children begin walking until school entry, is characterized by intense activity and discovery. It is a time of marked physical and psychosocial development. Motor development advances steadily. Children at this age acquire language and wider social relationships, learn role standards, gain self-control and skill mastery, develop increasing awareness of dependence and independence, and begin to develop a self-concept.

Middle Childhood: 6 to 12 Years

Frequently referred to as the *school age*, this period of development is one in which children expand relationships outside the family group and activities revolve around peer relationships. Physical, cognitive, and psychosocial development advances steadily, with emphasis on developing skill competencies. Social cooperation and early moral development take on more importance, with relevance for later life stages. This is a critical period in the development of a self-concept.

Adolescence: 12 to Approximately 19 Years

The period of rapid maturation and change known as adolescence is considered to be a transitional period that begins at the onset of puberty and extends to the point of entry into the adult world—in Canada, usually high school graduation. Biological and psychological maturation are accompanied by physical changes and emotional turmoil, and the self-concept is redefined. In the late adolescent period, children begin to internalize all previously learned values and to focus on an individual, rather than a group, identity.

Adapted from Hockenberry, M. J., & Wilson, D. (2011). *Wong's nursing care of infants and children* (9th ed.). St Louis, MO: Mosby.

children's needs are assessed and met by the plan. In a developmental approach, organized care is directed at an individual child's current level of functioning to motivate self-direction and health promotion; for example, you might instruct parents to encourage toddlers to feed themselves in order to advance their developing independence and promote their sense of autonomy. Understanding an adolescent's need to be independent should prompt you to negotiate with the adolescent to establish a contract about the care plan and its implementation. All care must be planned so that it is culturally safe (see Chapter 9), ethical and legal (see Chapters 7 and 8), and informed by the best evidence available (see Chapter 6).

Conception

From the moment of conception, human growth proceeds at a predictable and rapid rate. During the prenatal period, the embryo grows from a single cell to a complex, physiological being. All major organ systems develop in utero, and most function before birth.

Intrauterine Life

Intrauterine life that reaches full term usually lasts approximately 9 calendar months, or 40 weeks. The length of pregnancy is computed according to **Nagele's rule**, in which you count back 3 months from the first day of the pregnant woman's last menstrual period and then add 7 days. **Fertilization** occurs when a sperm penetrates the ovum and the material from both cell nuclei unites. The newly formed organism, known as a **zygote**, has its full genetic complement (1 pair of sex chromosomes and 22 pairs of autosomal chromosomes). The ovum and the sperm each contribute one chromosome to each pair. Through this mechanism, genetically determined characteristics (such as eye colour) are transmitted from parent to child and genetic conditions (such as Down syndrome) can result.

The zygote moves through the fallopian tube to the uterus within 3 to 4 days. During this time, the zygote continues to divide. Within 3 days, a solid ball of cells, the **morula**, has formed. The morula continues to develop and forms a central cavity, or **blastocyst**. Even at this early stage of development, cells begin to differentiate in structure and function. Cells at one end of the blastocyst develop into the **embryo**, and those at the opposite end form the **placenta**. Between days 6 and 10, some of the cells secrete enzymes that allow the blastocyst to burrow into the endometrium and become completely covered; this process is known as **implantation**. Chorionic villi—fingerlike projections that emerge from the outer sac surrounding the embryo—obtain oxygen and nutrition from the maternal blood supply and dispose of carbon dioxide and waste products.

The placenta produces essential hormones that maintain the pregnancy. It also provides nutrients to the developing fetus and removes wastes. Because the placenta is porous, noxious materials such as viruses and drugs can pass from mother to child. The effect of noxious agents on the fetus depends on the developmental stage in which exposure takes place; the embryonic stage (2 to 8 weeks after conception) is critical because the organ systems and the main external features are developing. The period of gestation is divided equally into three periods called *trimesters*.

First Trimester. During the first trimester, the first 3 calendar months, fetal cells continue to differentiate and develop into essential organ systems. As cellular change

Selecting a Developmental Framework for Nursing

Providing developmentally appropriate nursing care is easier when the care plan is based on a theoretical framework (see Chapter 21). An organized, systematic approach ensures that

(differentiation) and rapid organ growth (organogenesis) occur, each organ is vulnerable to conditions in the environment. Interference with growth can cause the congenital absence of an organ system or extensive structural or functional alterations. Because several organ systems develop at the same time, disruption of one system often occurs with disruption of others. Toward the end of the first trimester, it is possible to detect fetal heart tones by fetoscopy or ultrasonography.

Second Trimester. During the second trimester, from the end of the third month to the end of the sixth month, the height of the mother's uterus above the symphysis pubis is an indicator of fetal growth and approximate gestational age. Between 16 and 20 weeks, the mother begins to feel fetal movement. This feeling of life is referred to as **quickening**.

By the end of the sixth month, most of the fetal organ systems are complete and can function. The **fetus** is therefore considered viable, or capable of life outside the uterus, if given intensive environmental support. Fingers and toes are differentiated, rudimentary kidneys function, and the genitalia are defined. The fetus is covered with **vernix caseosa**, a cheeselike substance coating the skin. **Lanugo**, or fine hair, covers most of the body. These substances protect the thin, fragile skin and decrease in amount as the pregnancy nears its completion; thus, infants born before 38 weeks' gestation have more of these protective coverings than do full-term infants.

Third Trimester. During the last 3 months of gestation, the fetus grows to approximately 50 cm in length. Subcutaneous fat is stored, and weight increases to between 3.2 and 3.4 kg. The skin thickens, lanugo begins to disappear, and the fetal body becomes rounder and fuller.

A tremendous spurt in brain growth begins during this trimester and lasts well into the first few years of life. The central nervous system has established its total number of neurons and connections between neurons, and myelination of nerve fibres progresses at a rapid rate.

At the end of the third trimester, the normal fetus is physically able to make the transition from intrauterine to extrauterine life. The circulatory system, which bypasses the right side of the heart (which, in turn, supplies the lungs with oxygen), can change its circulation to include the lungs. The lungs are capable of maintaining the inflated state for gas exchange. The primitive temperature maintenance systems, reflexes, and sensory organs are ready for use.

Health Promotion

You can address many topics with a pregnant patient in order to protect her health and that of the fetus. Topics may vary, depending on the stage of pregnancy. Box 22-2 lists some of the many topics that you can address with pregnant women and their partners. You can make a significant difference in supporting the functions of young families. After an assessment of the couple's strengths and weaknesses, you can direct parents to available services to enhance their coping skills (Petch & Halford, 2008).

Transition from Intrauterine to Extrauterine Life

The transition from intrauterine to extrauterine life requires rapid changes in the newborn. You need to assess the newborn's ability to make these changes, and you should begin to plan before the birth for appropriate nursing interventions (Murray & McKinney, 2010). Circulatory, pulmonary, and

thermal changes all contribute to the infant's adaptation to neonatal life. Gestational age and development, exposure to depressant drugs before or during labour, and the newborn's own behavioural style also influence the adjustment to the external environment. Therefore, initial assessment encompasses a variety of physical and psychosocial elements. You can also provide early opportunities for the parents and infant to develop close emotional bonds.

Physical Changes

The most extreme physiological change occurs when the newborn leaves the in utero circulation and assumes independent respiratory functioning. Nursing care is directed at maintaining an open airway, stabilizing and maintaining body temperature, and protecting the newborn from infection. The most widely used assessment tool is the **Apgar score**, in which heart rate, respiratory effort, muscle tone, reflex irritability, and colour are rated in order to determine overall status. The Apgar assessment is generally conducted at 1 and 5 minutes after birth and may be repeated until the newborn's condition stabilizes. Table 22-1 outlines the scoring criteria of physiological functioning. A total score of 0 to 3 signifies severe distress, a score of 4 to 6 represents moderate difficulty, and a score of 7 to 10 indicates little difficulty in adjusting to extrauterine life. You can use the Apgar score to determine areas requiring further assessment and careful observation. In addition, you need to monitor and record the newborn's early elimination patterns (i.e., voiding and passage of meconium), as well as body temperature and other vital signs.

Psychosocial Changes

After conducting a physical evaluation and applying identification bracelets, promote the parents' and newborn's need for close physical contact. Early parent-child interaction encourages parent-child attachment or bonding. Physical factors (e.g., fatigue, hunger, and health) and emotional factors (e.g., needs for affection and for touch) are assessed.

Merely placing the family together does not promote closeness. The parents and newborn must be willing and able to respond to each other. Most healthy newborns are awake and alert for the first half-hour after birth. This is a good time for parent-child interaction to begin. Close body contact, often including skin-to-skin contact and breastfeeding, is a satisfying way for most families to start. If immediate contact is not possible, incorporate it into the care plan as early as possible, which may mean bringing the newborn to an ill parent or bringing the parents to an ill or premature child.

Bonding occurs when parents and newborn elicit reciprocal and complementary behaviour. Parental bonding behaviours include attentiveness and physical contact. Newborn bonding behaviour involves maintenance of physical contact with the parent. Preterm newborns, ill newborns, and ill mothers may have difficulty forming this bond if separation is prolonged; they need to be carefully assessed for any problems with attachment. The bonding process is further complicated if parents are unable to care for the infant. You should give the parents support throughout the early bonding process, particularly if the newborn or mother is ill or if the newborn is separated from the parents.

Health Risks

The removal of nasopharyngeal and oropharyngeal secretions with suction or a bulb syringe ensures airway patency.

* BOX 22-2 FOCUS ON PRIMARY HEALTH CARE

Health Promotion Topics for the Pregnant Patient

First Trimester Health Concerns

Nutrition

Mothers with good nutritional practices have fewer complications of pregnancy and childbirth and bear healthier babies than do mothers with poor nutritional intake (Murray & McKinney, 2010). Inadequate prenatal nutrition has been associated with lower birth weight (Oats & Abraham, 2010), and infants with low birth weight have an increased risk for learning disorders, temperament problems, neurological and motor impairment, and developmental delays. Folic acid (vitamin B₉) intake must be adequate before and during pregnancy; the recommended daily dose is 0.4 mg. Mothers should eat foods rich in folic acid, such as green leafy vegetables, liver, lentils, and asparagus. Folic acid intake is believed to be responsible for decreasing the incidence of neural tube defects (Health Canada, 2011). See Chapter 42 for a fuller description of the nutritional needs of the pregnant woman.

Teratogens

Agents capable of producing functional or structural damage to the developing fetus are called **teratogens**. You need to educate the mother about avoiding exposure to teratogenic agents. One such teratogen is the rubella virus, which can cause stillbirth or congenital anomalies, primarily when exposure occurs in the first trimester. Many drugs are teratogenic during the first trimester. You should assess the mother's past and current use of home remedies, medications (prescription and over-the-counter), and illegal drugs. The benefits of any drug needed to maintain the mother's health must be weighed against potential harm to the fetus.

Cigarette smoke and alcohol are also teratogens. Smoking during pregnancy has been shown to reduce birth weight and increase the incidence of premature birth, fetal death, and neonatal death (Murray & McKinney, 2010). It is also considered a risk factor for impaired growth and development among young children (Santrock, 2007). Alcohol consumed during pregnancy is known to cause fetal alcohol syndrome, fetal alcohol effects, and alcohol-related birth defects. Pregnant women must be educated about the risks of cigarette smoke and alcohol on the fetus.

Second Trimester Health Concerns

Preterm Labour

Preterm labour is labour that begins before the 37th week of pregnancy. With technological advances, it is possible for 500 g babies of

24 to 26 weeks' gestation to survive; however, the risk of morbidity and disability is significant. Causes of preterm labour are poorly understood and may be the result of maternal or fetal problems. Maternal risk factors include physiological stresses such as renal and cardiovascular disease, diabetes mellitus, and uterine and cervical abnormalities. Urinary tract infections greatly increase the risk of preterm labour. Because of dramatic changes occurring in the maternal renal system, it is possible for a mother to have an asymptomatic urinary tract infection. Voiding habits should be discussed with the mother during this time. Mothers living in poverty, smokers, and mothers receiving poor prenatal care are at higher risk for preterm labour (Kliegman et al., 2011). The presence of multiple fetuses and fetal infections are two of the potential fetal factors for preterm labour. Interventions to prevent preterm labour include medications, intravenous fluids, and bed rest.

Third Trimester Health Concerns

Choices of Birth Setting

In Canada, childbirth was gradually moved into hospital settings, starting in the early 1920s, and by 1950, approximately 76% of births occurred in hospitals (Mitchinson, 2002) because emergency backup was available in case of birth complications. Many hospitals have taken a family-centred approach to childbirth.

In some areas of the country, birthing centres are available for mothers who prefer a more homelike setting. Women delivering in this setting are required to attend childbirth classes, and the pregnancy must be considered low risk. Physicians and midwives with hospital privileges may attend births in these facilities. Mothers must understand that they may be transferred to a hospital if the conditions warrant.

A growing number of mothers choose to deliver at home when professional midwifery services are available. Control over the birth process and the desire for a more natural birth are common reasons why some mothers choose home births. Another reason is so that the entire family or other people close to the family can be part of the birth. You can support the mother by offering information and resources to help her choose the birth setting.



► TABLE 22-1 Apgar Scoring

Sign	Score 0	Score 1	Score 2
Heart rate	Absent	Slow, <100 bpm	>100 bpm
Respiratory effort	Absent	Irregular, slow, weak cry	Strong cry
Muscle tone	Limp	Some flexion of extremities	Strong flexion of extremities
Reflex irritability	No response	Grimace	Cry, sneeze
Colour	Blue, pale	Body pink, extremities blue	Completely pink

Adapted from Hockenberry, M. J., & Wilson, D. (2011). *Wong's nursing care of infants and children* (9th ed., p. 231). St Louis, MO: Mosby.

Newborns are susceptible to heat loss and cold stress (Kliegman et al., 2011). Because hypothermia increases oxygen needs, the newborn's body temperature must be stabilized and maintained. The newborn may be placed directly on the mother's abdomen and covered in warm blankets; dried and wrapped in warm blankets, with the head well covered; or

placed unclothed in an infant warmer with a temperature probe in place. For newborns unable to sustain adequate body temperature, isolettes and incubators, which supply radiant heat, are preferred.

Prevention of infection is a major concern in the care of the newborn, whose immune system is immature. Good

handwashing technique is the most important factor in protecting the newborn and yourself from infection. Once the blood and amniotic fluid have been removed from the infant's skin, you do not need to wear cover gowns while you provide care for the healthy newborn (Murray & McKinney, 2010). Other precautions include wearing gloves when touching mucous membranes or skin that is not intact (e.g., as a result of surgery or injury) and when drawing blood (e.g., heel stick).

The most commonly used prophylactic treatment against ophthalmic conjunctivitis is erythromycin (0.5%) because it prevents infections with *Neisseria gonorrhoeae* and other organisms, which can be transmitted during passage through an infected vaginal canal. This treatment should be applied during the newborn's initial assessment.

Vitamin K is administered in a single intramuscular injection shortly after birth. Vitamin K is important for the synthesis of prothrombin, necessary for clotting. Normally, the intestinal flora synthesizes vitamin K, and by about the third day, the infant should have enough intestinal flora to start to synthesize its vitamin K.

The stump of the moist umbilical cord is an excellent medium for bacterial growth. The cord should be cleansed with soap and water and dried at each diaper change. Until the stump dries and falls off, the diaper should be folded below the umbilicus to prevent accumulation of moisture.

Newborn

The neonatal period is the first month of life. During this stage, the newborn's physical functioning is mostly reflexive, and stabilization of the major organ systems is the body's primary task. Behaviour greatly influences interaction between the newborn and the environment and caregivers. For example, the average two-week-old newborn may smile and is able to regard the mother's face. The effect of these reflexive behaviours is generally a surge of feelings of love that prompt the mother to cuddle the baby.

You can apply your knowledge of this stage of growth and development to promote neonatal and parental health. If you understand, for example, that the newborn's cry is usually a response to an unmet need (such as hunger), you can assist parents in identifying ways to meet those needs, such as counselling the parents to feed their baby on demand rather than on a rigid schedule.

Physical Changes

A comprehensive nursing assessment is usually performed as soon as the newborn's physiological functioning is stable, generally within a few hours after birth. Measure the infant's height, weight, head circumference, temperature, pulse, and respirations, and observe general appearance, body functions, sensory capabilities, reflexes, and responsiveness.

The average newborn weighs 3400 g, is 50 cm in length, and has a head circumference of 35 cm. Up to 10% of birth weight is lost in the first few days after birth, primarily through fluid losses by respiration, urination, defecation, and low fluid intake. Birth weight is usually regained by the second week after birth, and a gradual pattern of increase in weight, height, and head circumference is evident. During the first month, weekly increases average 226 to 455 g in weight, 0.6 to 2.5 cm in length, and 2 cm in head circumference.

The newborn's heart rate ranges from 120 to 160 beats per minute. The average blood pressure is 85/54 mm Hg. The newborn's respiratory movements are primarily abdominal

and vary in rate and rhythm, with an average rate of 30 to 60 breaths per minute. The axillary temperature ranges from 36°C to 37.5°C and generally stabilizes within 24 hours after birth.

Normal physical characteristics include the continued presence of lanugo on the skin of the back; cyanosis of the hands and feet for the first 24 hours; and a soft, protuberant abdomen. Skin colour varies according to racial and genetic heritage and gradually changes during infancy. **Molding**, or overlapping of the soft skull bones, allows the fetal head to adjust to various diameters of the maternal pelvis and is a common occurrence with vaginal births. The bones readjust within a few days, producing a rounded appearance. The sutures and **fontanels** are usually palpable at birth. The diamond shape of the anterior fontanel and the triangular shape of the posterior fontanel between the unfused bones of the skull are shown in Figure 22-1.

To assess neurological function, observe the newborn's level of activity, alertness, irritability, responsiveness to stimuli, and reflexes. Normal reflexes include sucking, rooting, grasping, yawning, coughing, sneezing, hiccupping, blinking in response to bright lights, and startling (pulling arms and legs inward) in response to sudden, loud noises. An absence of any of these or other reflexes indicates **prematurity**, possible trauma, or central nervous system complications. Because the newborn depends largely on reflexes for survival and response to its environment, it is necessary to assess them. Figure 22-2 shows the tonic neck reflex: When newborns are lying supine, they reflexively turn the head to one side, extend the arm and leg on that side, and flex the opposite arm and leg.

Normal newborn behaviours include periods of sucking, crying, sleeping, and wakefulness. Movements are generally sporadic, but they are symmetrical and involve all four extremities. The relatively flexed fetal position of intrauterine life continues as the newborn attempts to maintain an enclosed, secure feeling. Newborns respond to sensory stimuli, particularly the primary caregiver's face, voice, and touch.

Except for the first hour after birth, when they are in a quietly alert state, newborns sleep almost continuously for the first 2 to 3 days to recover from the exhausting birth process. Thereafter, sleep periods vary from 20 minutes to 6 hours with little day-night differentiation.

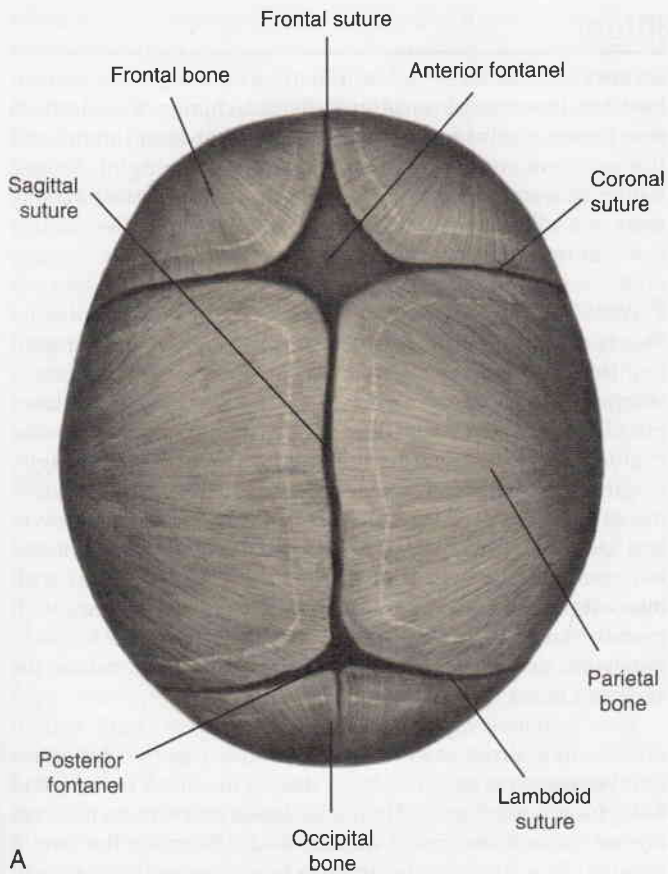
Cognitive Changes

Early cognitive development begins with innate behaviour, reflexes, and sensory functions. Newborns initiate reflex activities and learn behaviours and desires. For example, newborns reflexively turn to the nipple (rooting) and learn that crying results in parents' response of feeding, diapering, and cuddling.

Sensory functions contribute to cognitive development in the newborn. At birth, children can fixate on moving objects about 20 to 25 cm from their faces (Hockenberry & Wilson, 2011). A preference for the human face is apparent. Auditory and vestibular (i.e., equilibrium) systems function from birth. These sensory capabilities allow newborns to elicit stimuli rather than simply receive them. Parents should be taught the importance of providing sensory stimulation, such as talking to their newborns and holding them to see their faces. This allows infants to seek or take in stimuli, thereby enhancing learning and promoting cognitive development.

Psychosocial Changes

During the first month of life, parents and newborns normally develop a strong bond that grows into a deep attachment.



A



B

Figure 22-1 Fontanels and suture lines. **Source:** Adapted from Hockenberry, M. J., & Wilson, D. (2011). *Wong's nursing care of infants and children* (9th ed., p. 245, Fig. 8-7). St Louis, MO: Mosby.

Interactions during routine care enhance or detract from the attachment process. The processes of feeding, changing, bathing, and comforting an infant promote interaction and provide a foundation for deep attachments. Early on, older siblings should have the opportunity to be involved with the



Figure 22-2 Tonic neck reflex. **Source:** Courtesy Paul Vincent Kuntz, Texas Children's Hospital.



Figure 22-3 Siblings should be encouraged to visit with the newborn as soon as possible. **Source:** Courtesy Elaine Polan, RNC, BSN, MS.

newborn. Family involvement helps support growth and development and promotes nurturing (Figure 22-3).

If parents or newborns experience health complications after birth, bonding may be compromised. Infants' behavioural cues may be weak or absent, and caregiving may be less mutually satisfying. Tired, ill parents have difficulty interpreting and responding to their infants' cues. Children who have congenital anomalies are often too weak to be responsive to parental cues and require special supportive nursing care. For example, infants born with heart defects may tire easily during feedings. They may rest frequently after several bursts of

sucking. They may awaken frequently, crying because they are hungry again. Mothers may think that they are inadequate as mothers or that the infants are being fussy. Both infants and mothers may feel frustrated. In this case, bonding is not enhanced and may even be reduced unless nursing intervention breaks the sequence of events.

For newborns, crying is a means of communication and provides cues to parents (Santrock, 2007). Although it can be a sign of distress, such as from pain, crying is an adaptive response to extrauterine life. Babies may cry because their diapers are wet, they are hungry, they want to be held, or they need a change in position or activity. Their crying may frustrate the parents if no cause is apparent. With help, parents can learn to recognize infants' cry patterns and take appropriate action when necessary (Herman & Le, 2007).

Health Risks

Hyperbilirubinemia is a condition in which an excessive amount of bilirubin accumulates in the blood, and it is characterized by a yellowish colouring of the skin, or jaundice. The accumulation occurs when the infant's immature liver is unable to balance the destruction of red blood cells with the use or excretion of by-products. The balance can be further upset by prematurity, inadequate intake during breastfeeding, excess production of bilirubin, certain disease states, or a disturbance in the liver. Bilirubin at high levels is highly toxic to neurons, and affected newborns are at risk for brain injury. Phototherapy is used to help break down the bilirubin for easier excretion. During phototherapy, the infant's eyes must be shielded because they can be damaged by the light. Because excretion of the extra bilirubin can cause watery stools, adequate fluid balance in the infant must be maintained.

Health Concerns

Screening. Coordinate screening tests and other laboratory tests as needed. Blood tests can determine **inborn errors of metabolism**. This term applies to genetic disorders caused by the absence or deficiency of a substance, usually an enzyme, essential to cellular metabolism that results in abnormal protein, carbohydrate, or fat metabolism. Although inborn errors of metabolism are rare, they account for a significant proportion of health problems in children. Neonatal screening can detect phenylketonuria (PKU), hypothyroidism, and galactosemia and thus allow appropriate treatment that can prevent permanent intellectual disability and other health problems. Routine screening of newborns for PKU is recommended (Kliegman et al., 2011). Other screening (e.g., for cystic fibrosis or hemophilia) may be necessary, depending on the family history.

Circumcision. Circumcision is controversial in this country and is not recommended as a routine procedure by the Canadian Paediatric Society (2011). The controversy surrounds the risks and benefits, especially with regard to pain control. Risks have been identified as hemorrhage, infection, adhesions, and meatal stenosis. Benefits include prevention of penile cancer, prevention of urinary tract infections, and preservation of male body image to be consistent with that of peers when circumcision is part of the culture (Hockenberry & Wilson, 2011). Parents must give informed consent before the procedure. Care of the circumcised site depends on the type of method used for the procedure. Circumcised newborns should be checked frequently for evidence of swelling, oozing, excessive bleeding, and the ability to void.

Infant

Infancy, the period from 1 month to 1 year of age, is characterized by dramatic physical growth and change. Psychosocial development advances, and interaction between infants and the environment, are greater and more meaningful. Infants who giggle and roll over in response to tickling are interacting more with their social environments than when they merely smile in response to a hug.

Physical Changes

Steady and proportional growth of the infant is more important than absolute growth values. The infant's growth can be compared with charts of normal age- and gender-related growth measurements. Using growth charts, you can also evaluate an infant's growth patterns by recording weight, length, and head circumference at selected intervals. Measurements recorded over time are the best way to monitor growth and identify problems. An infant with a growth problem may have measurements generally below the expected norms at all intervals or may experience an acute, brief interference with growth. An infant with a feeding problem or a genetic condition such as cystic fibrosis may have a weight below the expected norm.

Size increases rapidly during the first year; birth weight doubles in approximately 5 months and triples by 12 months. On average, weight gain is 680 g during the first 5 months and 340 g for months 7 to 12. Height increases an average of 2.5 cm during each of the first 6 months and 3.8 cm for the next 6 months. This 50% increase in birth height occurs primarily in the trunk, with the chest diameter approximating that of the head by the first birthday (Hockenberry & Wilson, 2011). The fontanels become smaller; the posterior fontanel closes at about 2 months.

Physiological functioning stabilizes, and by the end of the first year, the heart rate is 90 to 140 beats per minute, the blood pressure averages 95/65 mm Hg, and the respiratory rate is 30 to 35 breaths per minute. Patterns of body function also stabilize, as evidenced by predictable sleep, elimination, and feeding routines. Motor development proceeds steadily in a cephalocaudal direction (from the head toward the feet).

Cognitive Changes

The infant learns by experiencing and manipulating the environment. Developing motor skills and increasing mobility expand an infant's environment and, with developing visual and auditory skills, enhance cognitive development. For these reasons, Piaget (1952) named his first stage of cognitive development, which extends until around the third birthday, the **sensorimotor period** (see Chapter 21). Before the acquisition of language, the extraordinary development of the mind occurs through children's developing senses and motor abilities. Improved visual acuity and eye-hand coordination allow grasping and exploration of objects. In addition, rudimentary colour vision begins by 2 months and improves throughout the first year, making the environment more interesting to see and explore. Infants' hearing also improves, allowing localization and discrimination of sounds.

Infants need opportunities to develop and use their senses. Evaluate the appropriateness and adequacy of these opportunities. For example, ill or hospitalized infants may lack the energy to interact with their environments, and thus their cognitive development may be slowed. Infants need to be

stimulated according to their temperament, energy, and age. Use stimulation strategies that maximize development of infants while conserving their energy and orientation. An example of this approach is talking to an infant and encouraging him or her to suck on a pacifier while administering a tube feeding.

Language. Speech is an important aspect of cognition that develops during the first year. Infants proceed from crying, cooing, and laughing to imitating sounds, comprehending the meaning of simple commands, and repeating words with knowledge of their meaning. By age 1 year, children recognize their own names and have two- or three-word vocabularies, usually including “Da-Da,” “Ma-Ma,” and “no.” You can promote language development by encouraging mothers to name objects on which their infants’ attention is focused.

Psychosocial Changes

Separation. During their first year, infants begin to differentiate themselves from other people, understanding that they are separate beings capable of acting on their own. Initially, infants are unaware of the boundaries of self, but through repeated experiences with the environment, they learn where the self ends and the external world begins. As infants determine their physical boundaries, they begin to respond to others.

At 2 or 3 months of age, infants begin to smile responsively rather than reflexively. Similarly, they can recognize differences in people when their sensory and cognitive capabilities improve. By 8 months, most infants can differentiate a stranger from a familiar person and respond differently to the two. Close attachment to the primary caregivers, most often parents, is usually established by this age. Infants seek out these people for support and comfort during times of stress. The ability to distinguish self from others allows children to interact and socialize within their environments. By 9 months, for example, children play simple social games such as patty-cake and peek-a-boo. More complex interactive games such as hide-and-seek involving objects are possible by the age of 1 year. Erikson (1963) described the psychosocial developmental crisis for the infant as trust versus mistrust. If the infant’s physical and emotional needs are met, then the infant begins to develop a sense of security (see Chapter 21).

Assess the availability and appropriateness of experiences contributing to psychosocial development. Hospitalized infants may have difficulty establishing physical boundaries because of repeated bodily intrusions and painful sensations. Limiting these negative experiences and providing pleasurable sensations are interventions that support early psychosocial development. Extended separations from parents complicate the bonding process and increase the number of caregivers with whom the infant must interact. Ideally, the parents should provide the majority of care during hospitalization. When parents are not present, an attempt should be made to limit the number of caregivers who have contact with the infant and to follow the parents’ directions for care. These interventions will foster the infant’s continuing development of trust.

Play. Play is a meaningful set of activities through which individuals interact with their environment and relate to others. Play provides opportunities for the infant to develop many motor skills. Much of infant play is exploratory, inasmuch as infants use their senses to observe and examine their own bodies and objects of interest in their surroundings. For example, placing their toes in their mouths provides infants

with pleasure and information about their own body and helps form their early self-concept. Play becomes manipulative as children learn control of the hands. Adults can facilitate infant learning by planning activities that promote the development of milestones and by providing toys that are safe for infants to explore with the mouth and manipulate with the hands, such as rattles, blocks, stacking rings, and washable stuffed animals. Infants most frequently engage in solitary (one-sided) play but do enjoy watching others, particularly siblings. Infants need to be played with and stimulated through interactions with others.

Health Risks

Sudden Infant Death Syndrome. Sudden infant death syndrome (SIDS) is the sudden and unexpected death of an apparently healthy infant. SIDS is rare before 1 month of age, but its incidence peaks among infants between 2 and 4 months of age, and it can occur in infants up to a year old. Three babies die of SIDS every week in Canada (Canadian Foundation for the Study of Infant Deaths, 2010). The cause of SIDS is not understood, but the Public Health Agency of Canada (2011a) recommends the following precautions:

- Infants should sleep on their backs on a firm, flat surface alone (i.e., sharing any sleeping surface with another person is hazardous to the infant).
- A smoke-free environment should be provided before and after birth.
- A baby’s crib must be free of such clutter as toys, bumper pads, pillows, blankets, and other loose bedding.
- The crib should be placed next to the adult’s bed for the first six months.
- The infant should be dressed lightly to avoid overheating.
- Mothers should breastfeed if possible.

Accidental Injury. Injury is a major cause of death in children 6 to 12 months old. An understanding of the major developmental accomplishments during this period helps you plan for injury prevention. Box 22-3 lists the main types of injuries occurring in this age group and possible prevention strategies.

Child Maltreatment. You need to be aware that child maltreatment can occur during any stage of a child’s life, beginning in infancy. *Child maltreatment* refers to violence, emotional or sexual mistreatment, or neglect of a child or adolescent. More children suffer from neglect than from any other type of maltreatment. Many suffer from more than one type of child maltreatment. Approximate numbers of reported cases of child maltreatment of children in Canada, not including Quebec, show that for every 1000 children there were six cases of neglect, five cases of physical maltreatment, three cases of emotional maltreatment, and one case of sexual maltreatment (Trocmé et al., 2005). Protection of children from maltreatment comes under the jurisdiction of a province or territory. If you suspect any type of maltreatment of children, you are legally required to report it. Box 22-4 includes possible signs and symptoms of child maltreatment. These indications apply to children from infancy through adolescence.

A combination of signs and symptoms or a pattern of injury should arouse suspicion. It is important for you to be aware of certain birthmarks (e.g., Mongolian spots, which are flat, dark birthmarks that may look like bruises) and cultural practices (e.g., coining, in which the skin is rubbed or scratched with a coin to improve circulation or restore balance) that may mimic signs of maltreatment.

► BOX 22-3 Injury Prevention During Infancy

Age: Birth to 4 Months

Major Developmental Accomplishments

Involuntary reflexes, such as the crawling reflex, may propel infant forward or backward, and the startle reflex may cause the body to jerk.

The infant may roll over.

Eye-hand coordination improves, and the voluntary grasp reflex increases.

Injury Prevention

Aspiration

Aspiration is not as great a danger in this age group as in others, but you should begin to practise safeguarding early (see "Age: 5 to 7 Months" section).

Never shake baby powder directly on the infant; place powder in your hand and then on infant's skin. Store container closed and out of the infant's reach.

Hold the infant for bottle feeding; do not prop the bottle.

Know emergency procedures for choking.

Use pacifiers with one-piece construction and loop handle.

Suffocation and Drowning

Keep all plastic bags stored out of the infant's reach; discard large plastic garment bags after tying them in a knot.

Do not cover the infant's mattress with plastic.

Use a firm mattress; use no pillows or loose bedding.

Make sure crib design follows federal regulations and mattress fits snugly; crib slats should be no farther than 6 cm apart.

Position the crib away from other furniture and away from radiators.

Do not tie a pacifier on a string around the infant's neck.

Remove bibs at bedtime.

Never leave the infant alone in a bath.

If the infant is younger than 12 months, do not leave him or her alone on an adult- or youth-sized mattress or on "beanbag"-type pillows.

Falls

Always raise crib rails.

Never leave the infant on a raised, unguarded surface.

When in doubt as to where to place the child, use the floor.

Restrain the child in an infant seat, and never leave him or her unattended while the seat is resting on a raised surface.

Avoid using a high chair until the child can sit well with support.

Poisoning

Poisoning is not as great a danger in this age group as in others, but you should begin to practise safeguards early (see "Age: 5 to 7 Months" section).

Burns

Install smoke detectors in the home.

Use caution when warming formula in a microwave oven; always shake the bottle and check temperature of liquid before feeding.

Check bath water temperature.

Do not pour hot liquids when the infant is close by (e.g., sitting on your lap).

Do not smoke cigarettes around the child.

Do not leave infant in the sun for more than a few minutes; keep exposed areas covered.

Wash flame-retardant clothes according to label directions.

Use cool-mist (rather than hot-mist) vaporizers.

Do not leave the child in a parked car.

Check the surface heat of the car restraint before placing the child in it.

Motor Vehicles

Transport the infant in a federally approved, rear-facing infant seat, in the back seat* (Figure 22-4).

Never place an infant seat in the front passenger seat with an air bag.*

Do not place the child in a carriage or stroller behind a parked car.

Do not leave infant in a vehicle on a warm day.

Bodily Damage

Avoid sharp, jagged objects.

Keep diaper pins closed and away from the infant.

Never shake a baby (which can cause shaken baby syndrome); advise caregivers to seek help if they feel irritated or overwhelmed by a baby's crying.

Age: 5 to 7 Months

Major Developmental Accomplishments

The infant rolls over.

The infant sits momentarily.

The infant grasps and manipulates small objects.

The infant picks up a dropped object.

The infant has well-developed eye-hand coordination.

The infant can focus on and locate very small objects.

The infant's tendency to put objects in his or her mouth is very prominent.

The infant can push up on hands and knees.

The infant crawls backward.

Injury Prevention

Aspiration

Keep buttons, beads, syringe caps, and other small objects out of the infant's reach.

Keep the floor free of any small objects.

Do not feed the infant hard candy, nuts, food with pits or seeds, or whole or circular pieces of hot dog.

Exercise caution when giving the infant teething biscuits, because large chunks may be broken off and aspirated.

Do not feed the infant while he or she is lying down.

Inspect toys for removable parts.

Suffocation

Keep all latex balloons out of the child's reach.

Remove all crib toys that are strung across the crib or playpen when the child begins to push up on hands or knees or is five months old.

Keep baby powder and baby oil, if used, out of the child's reach.

Falls

Restrain the child in a high chair.

Keep crib rails raised to their full height.

Do not use baby walkers (baby walkers are no longer sold in or imported to Canada because of the high rate of injuries that they cause).

Poisoning

Make sure that paint for furniture or toys does not contain lead.

Hang plants, or place them on high surfaces rather than on the floor.

Store coinlike batteries and any toxic substances, such as cleaning fluid, paints, and pesticides, out of the reach of babies on a high shelf or in a locked cabinet.

Discard used containers of poisonous substances.

Do not store toxic substances in food containers.

*Further information available from Transport Canada (2011) and Health Canada (2010b).

► BOX 22-3 Injury Prevention During Infancy—cont'd

Store medication in a locked cabinet and keep cosmetic and personal products out of the child's reach.

Know the telephone number of the local poison control centre (usually listed in the beginning of telephone directories).

Burns

Keep faucets out of reach.

Place hot objects (candles, incense) on high surfaces.

Limit the child's exposure to sun; apply sunscreen.

Motor Vehicles

See "Age: Birth to 4 Months" section.

Bodily Damage

Give the child toys that are smooth and rounded, preferably made of natural wood or plastic.

Avoid long, pointed objects as toys.

Avoid toys that are excessively loud.

Keep sharp objects out of the infant's reach.

See also the "Age: Birth to 4 Months" section.

Age: 8 to 12 Months

Major Developmental Accomplishments

The child crawls and creeps.

The child stands, holding on to furniture.

The child stands alone.

The child cruises around furniture.

The child walks.

The child climbs.

The child pulls on objects.

The child throws objects.

The child is able to pick up small objects and has pincer grasp.

The child explores objects by putting them in his or her mouth.

The child dislikes being restrained.

The child explores away from parents.

The child's understanding of simple commands and phrases increases.

Injury Prevention

Aspiration

Keep small objects out of the reach of children.

Feed very small pieces of solid table food.

Do not use beanbag toys or allow the child to play with dried beans.

See also the "Age: 5 to 7 Months" section.

Suffocation and Drowning

Keep doors of appliances (ovens, dishwashers, refrigerators, coolers, and front-loading clothes washers and dryers) closed at all times.

If you are storing an unused appliance, such as a refrigerator, remove the door.

Supervise contact with inflated balloons; immediately discard popped balloons, and keep uninflated balloons out of children's reach.

Fence in swimming pools.

Always supervise the child when near any source of water, such as baths, cleaning buckets, drainage areas, and toilets.

Keep bathroom doors closed.

Eliminate unnecessary pools of water.

Keep one hand on the child at all times when he or she is in the tub.

Falls

Fence stairways at the top and bottom if the child has access to either end.

Dress the child in safe shoes (soles that do not "catch" on the floor, tied shoelaces) and clothing (pant legs that do not touch the floor).

Ensure that furniture is sturdy enough for the child to hold while pulling himself or herself to a standing position and cruising.

Poisoning

Never call medications "candy."

Do not administer medications unless they are prescribed by a practitioner.

Put away medications and poisons immediately after use; put child-protector caps on properly.

Keep phone number for poison control centre readily available.

Burns

Place guards in front of or around any heating appliance, fireplace, or furnace.

Keep electrical wires hidden or out of the child's reach.

Place plastic guards over electrical outlets; place furniture in front of outlets.

Keep hanging tablecloths out of reach (the child may pull down hot liquids or heavy or sharp objects).

Adapted from Hockenberry, M. J., & Wilson, D. (2011). *Wong's nursing care of infants and children* (9th ed., pp. 510–511). St Louis, MO: Mosby.

Health Concerns

Nutrition. The quality and quantity of nutrition influence the infant's growth and development. Help parents select a nutritionally adequate diet for their infant. Nutrition is affected by many variables (e.g., culture, food preferences, slow eating, or food allergies), and no diet is effective for all children or for one age group.

Feeding Alternatives. Supplying essential nutrients to the infant is an important goal. Support the parents' choice of feeding methods and facilitate a successful feeding process (Box 22-5). Breastfeeding is considered the most complete nutritional source until the infant is about six months of age. Breast milk contains protein, fats, and carbohydrates, as well as immunoglobulins that bolster the infant's ability to resist infection. Breastfeeding has been associated with enhanced cognitive development and a decreased frequency of respiratory tract illnesses, type 2 diabetes, gastroenteritis, otitis media, and food allergies (Health Canada, 2007a; Hockenberry & Wilson, 2011).



Figure 22-4 Federally approved infant car restraint. Note that the seat is rear facing in the back seat. **Source:** Courtesy Elaine Polan, RNC, BSN, MS.

► BOX 22-4 Clinical Manifestations of Potential Child Maltreatment**Physical Neglect****Suggestive Physical Findings**

Failure to thrive (infants), signs of malnutrition (e.g., unhealthy looking skin and hair, sunken eyes or cheeks), evidence of poor health care

Poor personal hygiene, especially of teeth; unclean or inappropriate dress

Frequent injuries resulting from lack of supervision

Suggestive Behaviours

Dull and inactive (infants)

Self-stimulatory behaviours, such as finger sucking or rocking

Begging or stealing food, vandalism, or shoplifting

Absenteeism from school

Drug or alcohol addiction

Emotional Maltreatment and Neglect**Suggestive Physical Findings**

Failure to thrive

Feeding disorders, such as rumination

Enuresis (bed wetting after toilet training has been established)

Sleep disorders

Suggestive Behaviours

Self-stimulatory behaviours such as biting, rocking, sucking

Stranger anxiety and lack of social smile (infants)

Withdrawal and unusual fearfulness

Antisocial behaviour, such as destructiveness, stealing, cruelty

Extremes of behaviour, such as overcompliance, passivity, aggressiveness, or being demanding

Lags in emotional and intellectual development, especially language

Suicide attempts

Physical Maltreatment**Suggestive Physical Findings**

Bruises and welts on face, lips, mouth, back, buttocks, thighs, or areas of torso

Regular patterns on skin that are descriptive of certain objects, such as belt buckle; hand; wire hanger; chain; wooden spoon; squeeze or pinch marks; round cigar or cigarette burns; burns in the shape of an iron, radiator, or electric stove burner

Burns, injuries, fractures, lacerations, or bruises in various stages of healing on soles of feet, palms of hands, back, or buttocks

Presence of symmetrical burns in the absence of "splash" marks

Unusual symptoms, such as abdominal swelling, pain, and vomiting from punching

Marks such as those resembling human bites, or pulling out of hair

Unexplained repeated poisoning or unexplained sudden illness

Suggestive Behaviours

Wariness of physical contact with adults

Apparent fear of parents or of going home

Lying very still while surveying environment, lack of reaction to frightening events

Inappropriate reaction to injury, such as failure to cry from pain

Apprehensiveness when hearing other children cry

Indiscriminate friendliness and displays of affection, superficial relationships

Acting-out behaviour, attention-seeking behaviours

Withdrawn behaviour

Sexual Maltreatment**Suggestive Physical Findings**

Bruises, bleeding, lacerations, or irritation of external genitalia, anus, mouth, or throat

Torn, stained, or bloody underclothing

Pain on urination or pain, swelling, and itching of genital area; penile discharge; unusual odour in the genital area

Sexually transmitted infection, nonspecific vaginitis, venereal warts, or presence of sperm

Difficulty in walking or sitting

Recurrent urinary tract infections

Pregnancy in a young adolescent

Suggestive Behaviours

Sudden emergence of sexually related problems, including excessive or public masturbation, age-inappropriate sexual play, promiscuity, or overtly seductive behaviour

Withdrawn behaviour, excessive daydreaming, preoccupation with fantasies, especially in play

Poor relationships with peers

Sudden changes, such as anxiety, loss or gain of weight, clinging behaviour

In incestuous relationships, a child's excessive anger at one parent for not protecting the child from the other parent

Regressive behaviour, such as bed-wetting or thumb-sucking

Sudden onset of phobias or fears, particularly fears of the dark, men, strangers, or particular settings or situations (e.g., undue fear of leaving the house, of staying at the day care centre, or of staying at the babysitter's house)

Running away from home

Substance abuse, particularly of alcohol or mood-elevating drugs

Profound and rapid personality changes, especially extreme depression, hostility, and aggression (often accompanied by social withdrawal)

Rapidly declining school performance

Suicidal attempts or ideation about suicide

Adapted from Hockenberry, M. J., & Wilson, D. (2011). *Wong's nursing care of infants and children* (9th ed., p. 636). St Louis, MO: Mosby.

If breastfeeding is not possible or not desired by the parent, an acceptable alternative is commercially prepared formula that is fortified with iron. Formulas are convenient, contain standard ingredients, and are also fortified with vitamins and minerals. Cow's milk and imitation milks are not recommended in the first year, because infants are not able to properly digest the contained fat. Cow's milk also contains more sodium and protein and less iron and essential nutrients than does formula (Hockenberry & Wilson, 2011). Because cow's milk has low levels of iron and high levels of calcium and

phosphorus, absorption of iron may be decreased, causing anemia.

The average 1-month-old infant takes approximately 540 to 630 mL of breast milk or formula per day. This amount increases slightly during the first 6 months and decreases when solid foods are introduced. The amount of formula per feeding and the number of feedings vary among infants.

Developmentally, infants are not ready for solid food until 6 months of age. Before 6 months, the infant's gastrointestinal tract cannot handle the complex nutrients in solid food, and

* BOX 22-5 RESEARCH HIGHLIGHT

Breastfeeding

Research Focus

Fathers are a key source of breastfeeding support. You can play an important role in promoting breastfeeding by including fathers in breastfeeding education and interventions.



Research Abstract

Rempel and Rempel (2010) explored the role of involved fathers in breastfeeding families. The qualitative study was performed with a small sample of fathers ($n=21$) in two regions of Ontario. The researchers found that the fathers viewed breastfeeding as a team endeavour. The fathering role consisted of supporting breastfeeding by becoming breastfeeding savvy, using their knowledge of breastfeeding to encourage and assist mothers in breastfeeding, valuing the breastfeeding mothers, and sharing housework and child care. The researchers concluded that nurses and other health care providers need to assist fathers in recognizing their unique contributions to the breastfeeding team.

Evidence-Informed Practice

- Assess the breastfeeding support of new mothers.
- Include the mother's partner in supporting and offering praise to the breastfeeding mother.
- Include fathers in breastfeeding education and interventions.
- Promote the unique role of the father on the breastfeeding team.

Reference: Rempel, L. A., & Rempel, J. K. (2010). The breastfeeding team: The role of involved fathers in the breastfeeding family. *Journal of Human Lactation*. Advance online publication. doi:10.1177/0890334410390045.

the extrusion reflex causes food to be pushed out of the mouth. Also, early introduction to solid foods may cause food allergies.

Cereals and well-cooked and puréed fruits, vegetables, and meats eaten during the second 6 months of life provide iron and additional sources of vitamins. These nutrients become especially important when infants stop consuming breast milk or formula and begin drinking whole cow's milk after the first birthday. Because the amount and frequency of feedings vary among infants, discuss differing feeding patterns with parents.

Honey has been used to sweeten water and coat pacifiers. However, honey should not be given to infants younger than one year because of the potential for infant botulism poisoning (Kliegman et al., 2011).

Supplementation. The need for dietary vitamin and mineral supplements depends on the infant's diet. Full-term infants are born with some iron stores. The breastfed infant absorbs adequate iron from breast milk during the first 4 to 6 months of life. After age 6 months, iron-fortified cereal is generally considered an adequate supplemental source. Because iron in formula is less readily absorbed than that in breast milk, formula-fed infants should receive iron-fortified formula throughout the first year. All Canadian infants who are breastfed need to receive a daily 400 IU vitamin D supplement to prevent rickets (Health Canada, 2007a).

Adequate concentrations of fluoride to protect against dental caries are not available in human milk, so fluoridated water or supplemental fluoride is generally recommended. The presence of fluoride in formula depends on the type of

formula and the source of water used in preparing the concentrated forms. Fluoride supplementation may be necessary.

Overfeeding and Infant Obesity. The association between overfeeding, infant obesity, and later adult obesity is controversial. However, early feeding experiences can influence later eating habits. You should therefore emphasize balanced nutrition and good dietary habits through feeding experiences mutually satisfying for parents and infant. Eating habits are frequently affected by the family's sociocultural background. Because some cultures consider a fat baby to be a sign of good mothering, any suggestion to limit intake or slow weight gain may be seen as a threat. It is important for you to develop an understanding of cultural influences to develop effective nursing interventions. For example, breastfeeding is associated with a reduced risk of childhood obesity, but some cultural beliefs may promote formula feeding. A traditional belief in the Somali culture is that breast milk spoils in the breast after several hours (Steinman et al., 2009). Nurses working with pregnant or new mothers with a Somali cultural background need to educate these women and the Somali community about breastfeeding to counteract the cultural myth.

Dentition. The average age at which the first tooth erupts is 7 months, but considerable variation exists among infants because of their genetic endowment. Occasionally, an infant is born with a tooth, whereas others remain toothless at 1 year. The order of tooth eruption is fairly predictable: the lower central incisors are first to appear, closely followed by the upper central incisors. Most 1-year-olds have six teeth.

Teething may result in considerable discomfort for some infants and little or none for others. The inflammation of the gums before the tooth emerges may result in a low-grade fever and irritability. Some infants exhibit increased drooling, biting, or finger sucking. Biting on a frozen teething ring or ice cube wrapped in a washcloth may be soothing. Over-the-counter teething medications to rub on the inflamed gums and appropriate doses of acetaminophen are helpful when the infant is irritable and has difficulty eating or sleeping.

Most dentists recommend that parents cleanse their infant's teeth after each feeding. The parent can place a clean, wet washcloth or piece of gauze over a finger and use it to wipe the infant's teeth. Because of the risk of developing dental caries, discourage prolonged breast- or bottle-feeding, especially just before the infant goes to sleep because the infant is likely to leave milk in the mouth and around the teeth. The infant should never go to bed with a bottle of juice or milk (Kliegman et al., 2011).

Immunizations. The widespread use of immunizations has resulted in the dramatic decline of infectious diseases since the 1950s and is therefore a most important factor in health promotion during childhood. Although most immunizations can be given to people of any age, the Public Health Agency of Canada (2006) recommended that the administration of the primary series begin soon after birth and be completed during early childhood. The Canadian national immunization guidelines for infants and children, which are currently under review, are presented in Table 22-2. However, publicly funded immunization schedules vary from province to province or territory. Therefore, you must know the specific immunization schedule for your jurisdiction. The Public Health Agency of Canada (2011b) maintains an online tool where parents can create a personal immunization schedule for their child based on age and provincial or territorial residence. Parents must receive instructions regarding the potential side effects of

► TABLE 22-2 Canadian Routine Immunization Schedule for Infants and Children

Age at Vaccination	DTaP-IPV	Hib	MMR	Var	HB	Pneu-C-7	Men-C	Tdap	Inf
Birth					Infancy: 3 doses				
2 months	⊛	+			★	◆	⊙		
4 months	⊛	+				◆	(⊙)		
6 months	⊛	+				◆	⊙ or		6–23 months
12 months			■	●	or	◆ 12–15 months	⊙ if not yet given		●
18 months	⊛	+	■ or						1–2 doses
4–6 years	⊛		■						
14–16 years					Preteen/teen: 2–3 doses		⊙ if not yet given	▲	

Legend

() Symbols with brackets around them imply that these doses may not be required, depending upon the age of the child or adult. Refer to the relevant chapter (in Public Health Agency of Canada, 2006) for that vaccine for further details.

⊛ Diphtheria, tetanus, a cellular pertussis, and inactivated polio virus vaccine (DTaP-IPV): DTaP-IPV(± Hib) vaccine is the preferred vaccine for all doses in the vaccination series, including completion of the series in children who have received one or more doses of DPT (whole cell) vaccine (e.g., recent immigrants). Year dose can be omitted if the fourth dose was given after the fourth birthday.

★ Haemophilus influenzae type b conjugate vaccine (Hib): The Hib schedule shown is for the Haemophilus b capsular polysaccharide-polyribosylribitol phosphate (PRP) conjugated to tetanus toxoid (PRP-T). For catching up, the number of doses depends on the age at which the schedule is begun (see Public Health Agency of Canada, 2006, "Haemophilus Vaccine" chapter). Not usually required past age 5 years.

■ Measles, mumps, and rubella (MMR) vaccine: A second dose of MMR vaccine is recommended for children at least 1 month after the first dose for the purpose of better measles protection. For convenience, options include giving it with the next scheduled vaccination at 18 months of age or at school entry (4–6 years) (depending on the provincial or territorial policy) or at any intervening age that is practical.

• Varicella vaccine (Var): children aged 12 months to 12 years should receive one dose of varicella vaccine. Susceptible individuals ≥13 years of age should receive two doses at least 28 days apart.

★ Hepatitis B vaccine (HB): hepatitis B vaccine can be routinely given to infants or preadolescents, depending on the provincial or territorial policy. For infants born to chronic carrier mothers, the first dose should be given at birth (with hepatitis B immunoglobulin); otherwise, the first dose can be given at 2 months of age to fit more conveniently with other routine infant immunization visits. The second dose should be administered at least 1 month after the first dose, and the third at least 2 months after the second dose, but these may fit more conveniently into the 4- and 60-month immunization visits. A two-dose schedule for adolescents is an option (see Public Health Agency of Canada, 2006, "Hepatitis B Vaccine" chapter).

◆ Pneumococcal conjugate vaccine-7-valent (Pneu-C-7): Recommended for all children under 2 years of age. The recommended schedule depends on the age of the child when vaccination is begun (see Public Health Agency of Canada, 2006, "Pneumococcal Vaccine" chapter).

□ Pneumococcal polysaccharide-23-valent (Pneu-P-23): Recommended for all adults ≥65 years of age (see Public Health Agency of Canada, 2006, "Pneumococcal Vaccine" chapter).

⊙ Meningococcal C conjugate vaccine (Men-C): Recommended for children under 5 years of age, adolescents, and young adults. The recommended schedule depends on the age of the individual (see Public Health Agency of Canada, 2006, "Meningococcal Vaccine" chapter) and the conjugate vaccine used. At least one dose in the primary infant series should be given after 5 months of age. If the provincial or territorial policy is to give Men-C to persons ≥12 months of age, one dose is sufficient.

▲ Diphtheria, tetanus, acellular pertussis vaccine—adult or adolescent formulation (Tdap): A combined adsorbed "adult type" preparation for use in people ≥7 years of age; contains less diphtheria toxoid and pertussis antigens than preparations given to younger children and is less likely to cause reactions in older people.

❖ Diphtheria, tetanus vaccine (Td): A combined adsorbed "adult type" preparation for use in people ≥7 years of age; contains less diphtheria toxoid antigen than preparations given to younger children and is less likely to cause reactions in older people. It is given to adults not immunized in childhood as the second and third doses of their primary series and subsequent booster doses; Tdap is given only once under these circumstances, as it is assumed that previously unimmunized adults will have encountered *Bordetella pertussis* and have some preexisting immunity.

● Influenza vaccine (Inf): Recommended for all children 6–23 months of age and all persons ≥65 years of age. Previously unvaccinated children <9 years of age require two doses of the current season's vaccine with an interval of at least 4 weeks. The second dose within the same season is not required if the child received one or more doses of Influenza vaccine during the previous Influenza season (see Public Health Agency of Canada, 2006, "Influenza Vaccine" chapter).

✦ Inactivated polio virus (IPV).

From Public Health Agency of Canada. (2006). *Canadian immunization guide: Seventh edition—2006*. Retrieved from <http://www.phac-aspc.gc.ca/publicat/cig-gci/index-eng.php>. Reproduced with permission of the Minister of Public Works and Government Services Canada, 2008.

immunizations. Minor side effects may occur, but serious reactions are rare. High fever and extreme irritability should be reported to the health care provider.

As a result of complacency and fear regarding the side effects of certain vaccines, especially diphtheria and tetanus toxoids and pertussis vaccine (DTP), not all children receive appropriate immunizations (Leitch, 2007). An important role for you is to discuss the importance of vaccination for infants

and children, provide up-to-date information to parents, and encourage them to make an informed decision for their children. General contraindications to vaccination include moderate illness, allergic response to a previous dose of a particular vaccine, and with live vaccines only, pregnancy, immunosuppression, and taking high doses of corticosteroids.

Sleep. Sleep patterns vary among infants, many having their days and nights "mixed up" until 3 to 4 months of age.

► **TABLE 22-3** Selected Sleep Disturbances During Infancy and Early Childhood

Disorder and Description	Management
Nighttime Feeding Colic, irritability Prolonged need for bottle or breastfeeding at night Going to sleep at the breast or with a bottle Irregular sleep patterns Returning to sleep after feeding; other comfort measures (e.g., rocking or holding) are usually ineffective	Soothe, rock for brief periods, offer pacifier. Gradually increase daytime feeding intervals to 4 hours or more. Offer last feeding as late as possible at night. Gradually increase amount of fluid during day. Offer no bottles in bed. Put child to bed when awake. When child is crying, check at progressively longer intervals each night; reassure child but do not hold, rock, take to parent's bed, or give bottle or pacifier.
Developmental Night Crying Child aged 6–12 months with undisturbed nighttime sleep now awakes abruptly; awakening may be accompanied by nightmares	Be assured that this phase is temporary. Enter room immediately to check on child, but keep reassurances brief. Avoid feeding, rocking, taking to parent's bed, or any other routine that may initiate trained nighttime crying.
Trained Night Crying (Inappropriate Sleep Associations) Child typically falls asleep in a place other than own bed (e.g., rocking chair or parent's bed) and is brought to own bed while asleep; on awakening, cries until usual routine is instituted (e.g., rocking)	Put child in own bed when child is awake. If possible, arrange sleeping area separate from other family members. Check crying child at progressively longer intervals each night; reassure child but do not resume usual routine.
Refusal to Go to Sleep Child resists bedtime and comes out of room repeatedly Nighttime sleep may be continuous, but frequent awakenings and refusal to return to sleep may occur and become a problem if parent allows child to deviate from usual sleep pattern	Evaluate whether bedtime is too early (child may resist sleep if not tired). Adapt consistent bedtime routine. If child persists in leaving bedroom, close door for progressively longer periods. Reinforce positive behaviour.
Nighttime Fears Child resists going to bed or wakes during the night because of fears Child seeks parent's physical presence and falls asleep easily with parent nearby Overwhelming fears	Evaluate whether bedtime is too early (child may fantasize when he or she has nothing to do but think in a dark room). Calmly reassure the frightened child; keeping a night light on may be helpful. Use reward system with child to provide motivation to deal with fears. Avoid patterns that can lead to additional problems (e.g., sleeping with child or taking child to parent's room). If child's fear is overwhelming, consider desensitization (e.g., progressively spending longer periods of time alone); obtain professional help for protracted fears. Distinguish between nightmares and sleep terrors (confused partial arousals).

By that age, most infants sleep between 9 and 11 hours a night. Total daily sleep averages 15 hours. Most infants take one or two naps a day by the end of the first year. Sleep disturbances with a physiological basis are rare, with the possible exception of colic. Common sleep disturbances are described in Table 22-3.

Toddler

Toddlerhood ranges from 12 to 36 months. Toddlers have increasing independence, physical mobility, and cognitive abilities. Toddlers become aware of their abilities to control their environments and are pleased with successful efforts. This success leads them to continue attempting to control their environments. Unsuccessful attempts at control may result in the toddler refusing to do something, saying no frequently, or engaging in temper tantrums.

Physical Changes

The rapid development of motor skills allows toddlers to participate in self-care activities such as feeding, dressing, and toileting. Initially, toddlers walk with a broad stance and gait,

protuberant abdomen, and arms out to the sides for balance. Soon they begin to navigate stairs, using a rail or the wall to maintain balance. Locomotion skills eventually include running, jumping, standing on one foot for several seconds, and kicking a ball. Most toddlers can ride tricycles, climb ladders, and run well by their third birthday.

Fine motor capabilities move from scribbling spontaneously to drawing circles and crosses accurately. By age three years, children draw simple stick people and can usually stack a tower of small blocks. Increased locomotion skills, the ability to undress, and development of sphincter control allow toilet training if a toddler has developed the necessary language and cognitive abilities. Parents often consult nurses for an assessment of readiness for toilet training. A child's recognition of the urge to urinate and defecate is a crucial component in the child's mental readiness. At this stage, children usually show a willingness to please parents and take pride in their accomplishments (Santrock, 2007). You must remind parents that patience, consistency, and a nonjudgemental attitude, in addition to child readiness, are essential for successful toilet training.

The cardiopulmonary system becomes stable in the toddler years. The heart and respiratory rates slow to an average of 110 beats and 25 breaths per minute, respectively, and the blood pressure varies slightly from infancy. The average blood pressure in toddlers is 90/50 mm Hg.

The anterior fontanel closes between 12 and 18 months of age, ending the period of the most rapid growth of the skull and brain. However, head circumference should be measured routinely until a toddler is 3 years of age.

The rate of increase in a toddler's weight and length slows. By age 2.5 years, children's weights are four times the birth weight. Height during the toddler years increases by approximately 7.5 cm a year, mainly as a result of increases in leg length. The average height of 2-year-olds is 85 cm. Slowed growth rates are accompanied by decreased caloric need, and smaller food intake leads some parents to worry about the adequacy of dietary intake. Parents need encouragement to offer appropriate servings of food from *Eating Well With Canada's Food Guide* (Health Canada, 2007b) and to avoid force-feeding or allowing children to fill up on foods that have high levels of fat and sugar. You can reassure parents that a child's nutrition is adequate by demonstrating the child's satisfactory status on a growth chart.

Cognitive Changes

Toddlers' completion of the development of **object permanence**, their ability to remember events, and their beginning ability to put thoughts into words at about 2 years of age signal their transition to Piaget's (1952) **preoperational thought** stage of cognitive development (see Chapter 21). Toddlers recognize that they are separate beings from their mothers, but they are unable to assume another person's point of view. They use symbols to represent objects, places, and people. This function is demonstrated when children imitate the behaviour of another person that they viewed earlier (e.g., pretend to shave like daddy), pretend one object is another (e.g., pretend that a doll is a baby), and use language to stand for absent objects (e.g., request a bottle).

Language. An 18-month-old child uses approximately 50 words (Santrock, 2007). A 24-month-old child has a vocabulary of up to 200 words and is generally able to speak in two-word sentences. "Who's that?" and "What's that?" typify questions asked during this period. First-person expressions such as "Me do it" and "That's mine" demonstrate 2-year-old children's use of pronouns and desire for independence and control. Despite the expanded vocabulary of older toddlers, the word they use most often is no until well into the third year. Offering choices to toddlers helps reduce their sense of frustration and builds their sense of independence (Santrock, 2007).

Because children's moral development is closely associated with their cognitive abilities, the moral development of toddlers is only beginning and is also egocentric. Toddlers do not understand concepts of right and wrong. However, they understand that some behaviours bring pleasant results and others elicit unpleasant results. Therefore, until toddlers achieve a higher level of cognitive function, they behave simply to avoid the unpleasant and seek out the pleasant (Hockenberry & Wilson, 2011).

Psychosocial Changes

According to Erikson (1963), a sense of autonomy emerges during the toddler years (see Chapter 21). Children strive for independence by using their developing muscles to do

everything for themselves and control their bodily functions. Their strong wills are frequently exhibited in negative behaviour when caregivers attempt to direct their actions; for example, temper tantrums may result when toddlers are frustrated by parental restrictions. Parents need to provide toddlers with graded independence, allowing them to do things that do not result in harm to themselves or others. This strategy prevents them from doubting their abilities or feeling a sense of shame for what they have done. Firm consistent limits, patience, and support allow toddlers to develop socially acceptable behaviour and cope with the frustration of learning self-control (Santrock, 2007).

Socially, toddlers remain strongly attached to their parents and fear separation from them. In their parents' presence, toddlers feel safe, and their curiosity is evident in their exploration of the environment. Children continue to engage in solitary play during toddlerhood but also begin to participate in parallel play, which is playing beside rather than with another child. Toddlers who are just learning what belongs to them are often possessive of their toys. They learn the joy of sharing when they offer parents or caregivers toys to hold and the parents or caregivers express pleasure.

Health Risks

Their newly developed locomotion abilities and insatiable curiosity put toddlers at risk for injury. Toddlers need close supervision at all times, particularly when in environments that have not been child-proofed (Figure 22-5). Creating a safe, childproof environment in the home is essential for preventing accidental injuries.

Poisonings occur frequently in children nearing 2 years of age because they are interested in placing any object or substance in their mouths to learn about it. Parents must remove or lock up all possible poisons, including plants, cleaning materials, and medications. Lead poisoning can pose a health hazard for younger children (Leitch, 2007). Health care



Figure 22-5 Safety precautions should be provided for toddlers.
Source: Courtesy Elaine Polan, RNC, BSN, MS.

providers need to educate families living in older homes about the risks, screening, and treatment of lead poisoning. Because of toddlers' lack of awareness regarding the danger of water and their newly developed walking skills, drowning is a major cause of accidental death in this age group. Toddlers can easily become separated from a parent because they often wander away. It is important to closely supervise toddlers, especially in an open public space. Setting limits is extremely important for toddlers' safety. In automobiles, toddlers must remain in car seats. Under Canadian law, infants up to 9 kg must ride in rear-facing car seats, but it is safer for children to remain in this position until they grow out of these seats (Transport Canada, 2011). The American Academy of Pediatrics (2011a) recommends rear-facing car seats for all children under the age of two. Children often learn to release the car restraints, and parents must be firm in their resolve not to drive unless the children are securely restrained. Toddlers depend completely on their parents for physical safety. Health care providers must educate parents on proper use of child passenger restraints. Table 22-4 identifies developmental abilities acquired during this age period and injury prevention strategies.

Health Concerns

Nutrition. Most toddlers stop drinking breast milk or formula and begin drinking cow's milk. Nutritional requirements are increasingly met by solid foods. Because the consumption of more than 1 L of milk per day usually decreases children's appetite for these essential solid foods and results in inadequate iron intake, you should advise parents to limit milk intake to between 500 and 750 mL (two to three servings) per day. Children should not drink low-fat or skim milk until 2 years of age because they need the fat in whole milk for physical and intellectual growth. Healthy toddlers require a balanced daily intake of bread and grains, vegetables, fruit, dairy products, and proteins (see Chapter 42). Because parents frequently overestimate the size of a normal serving for their child, you should discuss normal serving sizes with parents.

Special dietary considerations are required for children who are ill, are undergoing surgery, or have conditions involving ingestion, absorption, or use of nutrients. Alterations in the type of foods and caloric requirements may be necessary. Strict vegetarian diets for children also require careful planning to ensure adequate, balanced protein intake. Regardless of children's health status, several basic principles of nutrition apply. Mealtime has psychosocial and physical significance. If the parents struggle to control toddlers' dietary intake, problematic behaviour and conflicts may result. Toddlers often develop "food jags," or the desire to eat one food repeatedly. Rather than becoming disturbed by this behaviour, parents should be encouraged to offer a variety of nutritious foods at meals and to provide only nutritious snacks between meals. Serving finger foods to toddlers allows them to eat by themselves and to satisfy their need for independence and control. Small, reasonable servings allow toddlers to eat all of their meals.

Preschooler

The **preschool period** encompasses the years between three and five years of age. Children refine the mastery of their bodies and often are eager to begin school. Many people consider these the most intriguing years of parenting because children exhibit positive emotions and can more effectively share their thoughts, interact, and communicate. Physical

development occurs at a slower pace than does cognitive and psychosocial development.

Physical Changes

Physical development continues in the preschool years. Heart and respiratory rates range from 60 to 100 beats and 23 to 25 breaths per minute, respectively. Blood pressure rises slightly to an average of 92/56 mm Hg. Children gain about 2.27 kg per year; the average weight is 14.5 kg at 3 years, 16.8 kg at 4 years, and about 18.6 kg at 5 years. Preschoolers grow 6 to 7.5 cm per year, double their birth length at about 4 years of age, and stand an average of 1 m tall by their fifth birthday. The elongation of the legs results in a more slender appearance. Little difference exists between the sexes, although boys are slightly larger with more muscle and less fatty tissue.

Large and fine muscle coordination improves. Preschoolers run well, walk up and down steps with ease, and learn to hop. By age 5 years, they can usually skip on alternate feet, can jump rope, and begin to skate and swim. Improvements in fine motor skills allow intricate manipulations. Children learn to copy crosses and squares. Triangles and diamonds are usually mastered between ages 5 and 6 years. Scribbling and drawing help children develop fine muscle skills and eye-hand coordination needed for the printing of letters and numbers.

Children need opportunities to learn and practise new physical skills. Early intervention programs are helpful in developing these skills, especially among disadvantaged children. Nursing care of healthy and ill children includes assessment of the availability of these opportunities. Although children with acute illnesses benefit from rest and exclusion from usual daily activities, children who have chronic conditions or have been hospitalized for long periods need ongoing exposure to developmental opportunities. With the parents, weave these opportunities into the children's daily experiences depending on their abilities, needs, and energy level.

Cognitive Changes

Preschoolers continue to master the preoperational stage of cognition. The first phase of this period, known as *preconceptual thought* (2 to 4 years), is characterized by perception-bound thinking, in that children judge people, objects, and events by their outward appearance or what seems to be true (Piaget, 1952). For example, a child may think that a 240 mL glass full of fluid contains more than a 300 mL glass that also contains 240 mL of fluid because the smaller glass appears fuller. Even if they watch the fluid from the smaller glass being poured into the larger glass and the smaller glass refilled, they still assert that the full, smaller glass contains more.

Children's thinking is hindered by their limited attention and attending skills. **Artificialism**, the misconception that everything in the world has been created by humanity, may result in children's asking questions such as "Who built the mountains?" Another misconception of preschool thinking, **animism**, the attribution of animal life to inanimate objects, often results in statements such as "Trees cry when their branches are broken." A third misconception is a type of reasoning called **immanent justice**, the notion that if a built-in code of law and order is broken, punishment will occur immediately (Santrock, 2007). For example, a child might think that he became sick because he lied to his mother.

At about the age of 4 years, the intuitive phase of preoperational thought develops. Children's ability to think more complexly is demonstrated by their ability to classify objects

TABLE 22-4 Injury Prevention for Toddlers and Preschoolers**Developmental Abilities Related to Risk of Injury**

Walks, runs, and climbs
 Is able to open doors and gates
 Can ride tricycle
 Can throw ball and other objects

Injury Prevention**Motor Vehicles**

Continue to use federally approved car restraint. Until the age of 2, children should ride in rear-facing car seats. Then, toddlers weighing up to 18 kg should be placed in a forward-facing child seat that is anchored to the vehicle frame with a tether strap. A child weighing 18 to 36 kg should be seated in a booster seat.
 Supervise child while he or she is playing outside, to prevent child from entering street.
 Do not allow child to play on curb or behind a parked car.
 Do not permit child to play in pile of leaves, snow, or anywhere that he or she is not visible.
 Supervise tricycle riding.
 Supervise child playing outside.
 Teach children to obey pedestrian safety rules.
 Supervise child when near traffic.

Has great curiosity
 Is helpless in water, unaware of its danger at any depth

Drowning

Supervise closely when child is near any source of water, including buckets. Keep bathroom doors and lid on toilet closed. Have fence around swimming pool, and lock gate. Teach the child swimming and water safety (and continue to protect him or her from injury).

Is able to reach heights by climbing, stretching, standing on toes, and using objects as a ladder
 Pulls objects
 Explores any holes or openings
 Can open drawers and closets
 Is unaware of potential sources of heat or fire
 Plays with mechanical objects

Burns

Turn pot handles toward back of stove.
 Place electric appliances, such as coffeemaker or frying pan, toward back of counter.
 Place guard rails in front of radiators, fireplaces, and heating appliances.
 Store matches and cigarette lighters in locked or inaccessible area; discard carefully.
 Place burning candles, incense, hot foods, ashes, embers, and cigarettes out of reach.
 Do not let tablecloth hang within child's reach.
 Do not let electric cord from iron or other appliance hang within child's reach.
 Cover electrical outlets with protective devices.
 Keep electrical wires hidden or out of reach.
 Do not allow child to play with electrical appliance, wires, or lighters.
 Stress danger of open flames; teach child what "hot" means.
 Always check bath water temperature; adjust hot-water heater temperature to 49°C or lower; do not allow child to play with faucets.
 Apply a sunscreen with SPF 15 or higher when child is exposed to sunlight.

Explores by putting objects in mouth
 Can open drawers, closets, and most containers
 Climbs
 Cannot understand warning labels

Poisoning

Place all potentially toxic agents (including plants) in a locked cabinet or out of reach.
 Put away medications and poisonous substances immediately after use; position (and tighten) child-resistant caps properly.
 Refer to medications as "drugs," not as "candy."
 Do not store large amounts of toxic agents.
 Promptly discard empty poison containers; never reuse such containers to store a food item or other poison.
 Teach child not to play in trash containers.
 Never remove labels from containers of toxic substances.
 Know number and location of nearest poison control centre (usually listed at beginning of telephone directories).

► **TABLE 22-4** Injury Prevention for Toddlers and Preschoolers—cont'd

Developmental Abilities Related to Risk of Injury

Is able to open doors and some windows
Goes up and down stairs
Has unrefined depth perception

Injury Prevention

Falls

Keep screen in window, nail securely, and install guard rail.
Place gates at top and bottom of stairs.
Keep doors locked or use child-resistant doorknob covers at entry to stairs, high porch, or other elevated area, such as laundry chute.
Remove unsecured or scatter rugs.
Apply nonskid mat in bathtub or shower.
Keep crib rails fully raised and mattress at lowest level.
Place carpeting under crib and in bathroom.
Keep large toys and bumper pads out of crib or playpen (child can use these as "stairs" to climb out).
Move child to youth bed when he or she is able to climb out of crib.
Dress child in safe clothing (soles that do not "catch" on floor, tied shoelaces, pant legs that do not hang on floor).
Never leave child unattended in shopping cart or stroller.
Supervise child at playgrounds; select play areas with soft ground cover and safe equipment.

Puts things in mouth
May swallow hard or nonedible pieces of food

Choking and Suffocation

Do not give child large, round chunks of meat, such as whole hot dogs (instead, slice into thin pieces).
Do not give child fruit with pits, fish with bones, dried beans, hard candy, chewing gum, nuts, popcorn, grapes, or marshmallows.
Choose large, sturdy toys without sharp edges or small removable parts.
Discard unused refrigerators, unused ovens, and other unused appliances; if storing old appliance, remove doors.
Keep automatic garage door opener in inaccessible place.
Select safe toy boxes or chests without heavy, hinged lids.
Keep window blind strings out of child's reach.
Remove drawstrings from clothing.

Is still clumsy in many activities
Is easily distracted from tasks
Is unaware of potential danger from strangers or other people

Bodily Damage

Avoid giving child sharp or pointed objects—such as knives, scissors, or toothpicks—especially when child is walking or running.
Do not allow lollipops or similar objects in the child's mouth when he or she is walking or running.
Teach safety precautions (e.g., to hold fork or scissors with pointed end away from face).
Store all dangerous tools, garden equipment, and firearms in locked cabinet.
Be alert to danger of animals, including household pets.
Use safety glass and decals on large glass areas, such as sliding glass doors.
Teach personal safety.
Teach child his or her name, address, and phone number, and teach child to ask for help from appropriate people (cashier, security guard, police officer) if lost; have identification on child (sewn in clothes, inside shoe).
Avoid dressing child in personalized clothing in public places.
Teach child to never go anywhere with a stranger.
Teach child to tell parents if anyone makes child feel uncomfortable in any way.
Always listen to child's concerns regarding others' behaviour.
Teach child to say no when confronted with uncomfortable situations.

Adapted from Hockenberry, M. J., & Wilson, D. (2011). *Wong's nursing care of infants and children* (8th ed., pp. 576–604). St Louis, MO: Mosby.

according to size or colour and by questions such as “Why do they call it the 31st day of the month instead of the 30 last?” Egocentricity persists, but during these 3 years, it begins to be replaced with social interaction; for example, a 5-year-old child offers a bandage to a child with a cut finger. Children become aware of cause-and-effect relationships, as illustrated by the statement “The sun sets because people want to go to bed.” Early causal thinking is also evident in preschoolers’ transductive thoughts (reasoning occurs from one particular to another). If two events are related in time or space, children link them in a causal manner. A hospitalized child, for example, may reason, “I cried last night, and that’s why the nurse gave me the shot.” As children near the age of 5 years, they begin to use or can be taught to use rules to understand causation. They then begin to reason from the general to the particular. This development forms the basis for more formal logical thought. The hospitalized child now reasons, “I get a shot twice a day, and that’s why I got one last night.”

Preschoolers’ knowledge of the world remains closely linked to concrete (perceived by the senses) experiences. Even their rich fantasy life is grounded in the perception of reality. The mixing of the two aspects can lead to many childhood fears, and adults may misinterpret children’s stories as lying when children are actually presenting reality from their perspective.

The greatest fear of this age group appears to be that of bodily harm, and it can be seen in children’s fear of the dark, thunderstorms, and medical personnel. This fear often makes children unwilling to allow nursing interventions such as measurement of vital signs. Preschoolers may cooperate if they are allowed to help you measure the blood pressure of a doll or teddy bear or if they are allowed to handle the equipment you will use.

Preschoolers’ moral development expands to include a beginning understanding of behaviours considered socially right or wrong. Children continue to be motivated, however, by the wish to avoid punishment and the desire to obtain a reward. The primary difference between this stage of moral development and that of toddlers is that preschoolers are better able to identify behaviours that elicit rewards or punishment and begin to label these behaviours as right or wrong.

Language. Preschoolers’ vocabularies continue to increase rapidly, and by the age of 6 years, children know more than 2100 words and can construct sentences containing 5 to 6 words (Hockenberry & Wilson, 2011). Language is more social, and questions expand to “Why?” and “How come?” Phonetically similar words such as “die” and “dye” or “wood” and “would” might cause confusion in preschool children. Avoid such words when you prepare children for procedures, and assess their comprehension of explanations.

Psychosocial Changes

The world of preschoolers expands beyond the family into the neighbourhood, where children meet other children and adults. Their curiosity and developing initiative lead to the active exploration of the environment, the development of new skills, and the making of new friends. Preschoolers have much energy, which enables them to plan and attempt many activities that may be beyond their capabilities, such as pouring milk into their cereal bowls. Guilt arises within children when they overstep the limits of their abilities and feel they have not behaved correctly. Children who in anger have wished their sibling were dead experience guilt if that sibling becomes ill.

Children need to be taught that “wishing” for something to happen does not make it occur. Parents should allow preschoolers to perform tasks on their own but must set firm limits and provide guidance.

During times of stress or illness, preschoolers may revert to bed-wetting or thumb-sucking and want the parents to feed, dress, and hold them. These dependent behaviours are often confusing and embarrassing to parents, who can benefit from your reassurance that they are the children’s normal coping behaviours. You should provide experiences that these children can master. Such successes help children return to their prior level of independent functioning. As language skills develop, children should be encouraged to talk about their feelings. Play is also an excellent way for preschoolers to vent frustration or anger and is a socially acceptable way to deal with stress.

Play. Children become more social after their third birthday as they shift from parallel to associative play. Children playing together engage in similar if not identical activity; however, no division of labour or rigid organization or rules exist. Most three-year-old children are able to play with one other child in a cooperative manner in which they make something or play designated roles, such as mother and baby. By the age of four years, children play in groups of two or three, and by five years, the group has a temporary leader for each activity.

In many play activities, preschoolers display awareness of social context. Sex role identification is strengthening and children most often assume roles of people of their own sex. Children frequently mimic or repeat social experiences. This tendency is especially significant in hospitalized children. Through play, children may express questions, fears, anger, and misunderstanding about their illnesses and care. Be alert to such clues and ensure that children can play within energy limits. Play can provide a healthy outlet for frustration, especially when children have been subjected to painful or restrictive experiences against their will.

Imaginary play depends on children’s memory of things they have seen or heard. This sociodramatic play involving other children occupies about a third of five-year-old children’s playtime. Pretending allows children to learn to understand others’ points of view, develop skills in solving social problems, and become more creative. Some children have imaginary playmates, which are a sign of creativity and healthy development.

Health Risks

As fine and gross motor skills develop, children become more coordinated with better balance; nevertheless, falls and other accidents remain a leading cause of injury. Guidelines for injury prevention in toddlers also apply to preschoolers (see Table 22-4). You should alert parents of children in this age group to the risks of poisoning and pedestrian–motor vehicle accidents. The leading cause of death in Canadian children is unintentional injury. All of these injuries are preventable. Children should be taught about safety in the home, and this teaching should be reinforced early in elementary school.

Health Concerns

Nutrition. Nutrition requirements for preschoolers vary little from those for toddlers. The average daily intake is 1800 calories. Parents may nonetheless worry about the amount of food their child is consuming. In most situations, however, the quality of the food is more important than quantity.

Preschoolers consume about half of the average adult portions. Finicky eating habits are characteristic of four-year-olds; in contrast, five-year-olds are more interested in trying new foods. It is important to monitor children's food intake because obesity may be evident first in preschool years (Leitch, 2007).

Sleep. Preschoolers average 12 hours of sleep a night and take infrequent naps. Sleep disturbances are common during these years. Disturbances may range from trouble getting to sleep to nightmares to prolonging bedtime with extensive rituals. Many preschoolers have had an overabundance of activity and stimulation during the day. Having children follow a set routine before bedtime helps them prepare for sleep.

Vision. Preschoolers should routinely be screened for vision problems. One of the common problems in the preschool period is amblyopia (blindness from disuse of an eye if a child has untreated strabismus). Early detection and treatment can improve vision for most children (Hockenberry & Wilson, 2011).

School-Age Children and Adolescents

School-age children and adolescents lead demanding, challenging lives. The changes that occur between 6 and 19 years of age are diverse and span all areas of growth and development. Physical, psychosocial, cognitive, and moral skills are developed, expanded, refined, and synchronized. The environment in which the individual develops skills also expands and diversifies. Instead of only family and close friends, the environment now may include the school, community, and religious institution. Because of expectations for development, increasing skill and knowledge base, and environmental expansion, the individual experiences new difficulties and dilemmas. With age-specific assessment, review the appropriate developmental expectations for each age group. For example, before assessing risk-taking behaviours, recognize that adolescents normally strive to achieve a sense of identity while developing a moral code compatible with society.

Direct school-age children and adolescents toward normal developmental behaviours, assisting them in improving their abilities and using them to cope. Table 22-5 provides an overview of developmental behaviours typical of school-age children and adolescents. You must also increasingly involve children or adolescents in charting a developmental course. Not only can they describe their feelings about the changes, but also they can think through these changes. Problem solving becomes more purposeful and sophisticated and results in the achievement of the outcomes that they desire. This paced, active participation may initiate a style of involvement in life-long self-care.

School-age children and adolescents must cope with many changes, and these can be a source of stress for children. For example, six-year-old children beginning school are confronted with new authority figures, teachers, and rules and restrictions. They need to work and play cooperatively with a large group of children of various cultural backgrounds. School-age children must meet the challenge of developing cognitive skills that enhance their reasoning and allow them to learn to read, write, and manipulate numbers. Because of the stress of these changes, children may develop physical and psychosocial health problems (e.g., increased susceptibility to upper respiratory infections, inadequate peer relationships, or poor performance in school). Design health promotion interventions that are based on an individual child's developmental stage.

School-Age Child

During these "middle years" of childhood, the foundation for adult roles in work, recreation, and social interaction is laid. In industrialized countries, this period begins when children start formal schooling at about the age of 6 years. **Puberty**, which occurs at about 12 years of age, signals the end of middle childhood. Great developmental strides are made during these years as children develop competencies in physical, cognitive, and psychosocial skills.

The school or educational experience expands children's world and is a transition from a life of relatively free play to a life of structured play, learning, and work. The school and home influence growth and development, necessitating adjustment by parents and children. Children must learn to cope with rules and expectations presented by the school and peers. Parents must learn to allow their children to make decisions, accept responsibility, and learn from life's experiences.

Physical Changes

The rate of growth during these early school years is slower than at any time since birth, but continues steadily. A particular child may not follow the pattern precisely. School-age children appear slimmer than preschoolers as a result of changes in fat distribution and thickness (Edelman & Mandle, 2010). Growth accelerates at different times for different children. The average increase in height is 5 cm per year, and weight, which is more variable, increases by 2 to 3 kg per year. An average 6-year-old is 116 cm tall and weighs 21 kg; the average 12-year-old is 150 cm tall and weighs 40 kg. Many children double their weight during these middle childhood years (Hockenberry & Wilson, 2011).

School provides children with the opportunity to compare themselves with children of the same age. The physical examination is an excellent opportunity to discuss with a child and parents the influences of genetic endowment, nutrition, and exercise on height and weight. Annual measurement of height and weight may reveal alterations in growth that are symptoms of the onset of a variety of childhood diseases.

Boys are slightly taller and heavier than girls during these early school years. Approximately two years before puberty, children experience a rapid acceleration in skeletal growth. Girls, who generally reach puberty first, begin to surpass boys in height and weight, which causes embarrassment to both sexes. In North America, puberty occurs between the ages of 9 and 13 years in girls and 11 and 14 years in boys.

Cardiovascular functioning is refined and stabilized during the school years. The heart rate averages 75 to 100 beats per minute, the blood pressure normalizes to approximately 110/65 mm Hg, and the respiratory rate stabilizes to 20 to 30 breaths per minute. Lung growth is minimal, and respirations become slower, deeper, and more regular. However, by the end of this period, the heart is six times the size it was at birth and has generally reached its adult size.

School-age children become more graceful during the school years because their large-muscle coordination improves and their strength doubles. Most children practise the basic gross motor skills of running, jumping, balancing, throwing, and catching during play, which results in refinement of neuromuscular function and skills. Fine motor skills improve, and as control is gained over fingers and wrists, children become proficient in a wide range of activities, although much individual difference exists in the rate and degree of proficiency.

► **TABLE 22-5** Developmental Behaviours of School-Age Children and Adolescents**School-Age Children****Relationships With Parents**

Children gradually learn that parents are less than perfect; children can become disillusioned with parents and wish that friends' parents were their own. They still rely on parents for unconditional love, security, guidance, and nurturing.

Relationships With Siblings

Siblings seem to be at odds with one another at home, and yet they tend to be each other's best defenders away from home. Younger children often idolize older siblings, and this frequently leads to competition. Older children may envy attention that younger siblings require and can be quite bossy and somewhat abusive.

Relationships With Peers

During primary grades (6–7 years), children of both sexes play together, depending on who is available and interested. Around age 8, social groupings of same-sex peers form. These groups allow children to declare their independence from parental rules and establish their own rules of membership and behaviour. Preadolescent (ages 10–12 years) friendships are characterized by having a best friend of the same sex. These relationships may be transient, but they are intense and allow discussion of all areas of life. Childhood "crushes" are common.

Self-Concept

Children's feelings of competence regarding mastery of tasks are key elements in forming self-esteem. Children need to receive positive feedback regarding their efforts. It is important for children to develop skills in at least one area such as reading, music, or swimming.

Fears

Fears related to body safety decline. Fears of supernatural beings such as ghosts and witches persist and decline slowly. New fears related to school and family occur. Children fear ridicule from teachers and friends and disapproval and rejection of parents. They also become frightened about death and events that they hear on the news, such as war and destruction of the environment.

Coping Patterns

To deal with stress, school-age children use problem solving and defence mechanisms such as denial and aggression. Several categories of coping behaviours of hospitalized school-aged children are inactivity (total silence, lack of activity, and apathy), orientation or precoping (looking and listening, walking around and exploring, and asking questions), cooperation (compliance with care), resistance (attempt to get away from the situation by turning away or making physical or verbal attacks), and controlling (assuming responsibility for self-care and suggesting how things could be done).

Morals

Children learn rules from parents, but their understanding of rules or reasons for them is limited until about age 10 years. Before that, they are concerned with their own needs first and may cheat to win games. After 10 years of age, they advocate justice and believe that punishment should fit the crime (e.g., if children break something, they should pay to have it fixed).

Adolescents

Adolescents desire increasing independence and autonomy and yet continue needing some dependence and limit setting by parents; this conflict places strain on the parent–child relationship. Effective communication and democratic parenting are the best tools for meeting this challenge.

Younger siblings rarely understand their adolescent siblings' need for privacy. Adolescents often enjoy interacting with and guiding younger brothers and sisters when timing is convenient for them and they can remain in control.

Peer group is of critical influence on adolescents, who increasingly need recognition and acceptance. Companionship offered by peer groups provides a secure environment for individuals to try out new ideas and share similar feelings and attitudes. Adolescents often form cliques with peers with similar interests from the same socioeconomic group. Cliques, which are highly exclusive, help their members develop their identities.

Formal and informal peer groups are a primary force in shaping self-concept of group members. Popularity and recognition within the peer group enhance self-esteem and reinforce self-concept. Total immersion in the peer group may make it appear that adolescents have no original thoughts and are incapable of making decisions. Adolescents who withdraw from peers into isolation struggle with developing identity.

Fears in this age group centre on peer group acceptance, body changes, loss of self-control, and emerging sexual urges. Adolescents constantly examine their bodies for changes and signs of imperfection. Any defect, real or imagined, is a cause of endless worry.

Coping behaviours expand with experiences adolescents have gained from life and from developing cognitive maturity. By age 15, most adolescents use a full range of defence mechanisms, including rationalization and intellectualization. Adolescents' problem-solving abilities have matured, and they can reason through philosophical discussions and complex situations that require abstract thinking and proposition of hypotheses. Some adolescents use avoidance coping strategies in which a problem is denied or repressed and an attempt is made to reduce tension by engaging in substance abuse or avoiding people.

According to Kohlberg (1964), as youths approach adolescence, they reach conventional level, where internalization of expectations of their family and society begins. Initially, youths exhibit considerable conformity to rules to win praise or approval from others and to avoid social disapproval or rejection; later, they seek to avoid criticism from people of authority in institutions.

► TABLE 22-5 Developmental Behaviours of School-Age Children and Adolescents—cont'd

School-Age Children**Diversional Activities**

School-age children play cooperatively in group activities such as sports and jumping rope. Play becomes competitive, and children often have difficulty learning to accept losing. Teasing, insults, dares, superstitions, and increased sensitivity are characteristics of this age.

Nutrition

Children have definite likes and dislikes. Few nutritional deficiencies occur in this age group. Children have voracious appetites after school and need quality snacks such as fruit and sandwiches to avoid empty-calorie foods such as chips and candy.

Adolescents

Many teenagers develop special interests in certain sports and concentrate on developing maximal skills therein. Recreational activities are often determined by what is popular with peers and what can provide independence from parents (e.g., computers, cars).

Total nutritional needs become greater during adolescence. Girls' caloric needs decrease and their need for protein increases slightly. Adolescents need to increase their consumption of iron-rich foods, and growth spurts increase calcium demand.

► TABLE 22-6 Average Motor Development in School-Age Children

Ages 6-7 Years**Fine Motor Skills**

Uses knife to butter bread and learns to cut tender meat
Cuts, folds, and pastes paper
Prints with pencil
Draws person with 12-16 details
Copies triangle at age 6 years and diamond by age 7 years
Colours within lines of picture
Needs assistance to clean teeth thoroughly

Ages 8-10 Years

Uses knife and fork simultaneously
Learns to thread needle and tie knot
Uses hammer, saw, and screwdriver
Becomes proficient at cursive writing
Uses symbols in drawing (e.g., bird, star)
Builds simple models of cars and planes and does simple handicrafts
Can learn to floss teeth effectively and be independent in tooth care

Ages 11-12 Years

Learns to peel apples and potatoes
Sews simple garments on machine
Builds simple objects like birdhouse
Enjoys writing in decorative script
Begins to use creative and artistic talents
Builds complex models of cars and planes and does complex handicrafts
Learns to play musical instrument
Becomes proficient in caring for teeth with braces and other appliances

Gross Motor Skills

Remains in constant motion when awake
Moves more cautiously at age 7 years than at age 6 years
Hops and jumps into small squares
Learns to roller skate, skip rope, ride a bicycle, and swim

Catches, throws, and hits a baseball
Engages in alternate rhythmic hopping
Engages in complex styles of skipping rope while reciting verbal jingles

Can perform standing broad jump of 1.5 m
Can perform standing high jump of 1 m
Engages in sports involving simultaneous use of two or more complex motor skills, such as ice skating, skateboarding, or playing hockey

Self-Care

Takes bath without supervision
Often returns to finger feeding
Learns to brush and comb hair in acceptable manner without help
Puts on most clothes but may need assistance with final adjustments

Learns to clean bathroom after bath
Enjoys fixing own snacks and sack lunch
Learns to part hair and insert barrettes
Dresses self completely and can help younger siblings with clothes
Can make own bed

Dusts, vacuums, and straightens own room
Learns to cook simply prepared foods
Washes, dries, and fixes own hair
Learns to sort, wash, dry, and press own clothing
Learns to care for fingernails and toenails

Most 6-year-olds can hold a pencil adeptly and print letters and words. By age 12 years, children can make detailed drawings and write sentences in script. Activities such as painting, drawing, playing computer games, and making models allow children to practise and improve newly refined skills. Parents should encourage children to pursue these activities. Table 22-6 describes specific gross motor and fine motor skills and their use in self-care activities.

The improved fine motor capabilities of school-age children allow them to become very independent in bathing, dressing, and taking care of other personal needs. They develop strong personal preferences in the way these needs are met. Illness and hospitalization threaten children's control in these areas; therefore, it is important to allow them to participate in care

and maintain as much independence as possible. For example, children whose care mandates restriction of fluids cannot be allowed to decide the amount of fluids they will drink in 24 hours, but they can help decide the type of fluids and can help keep a record of intake.

Assessment of neurological development is often based on fine motor coordination. This assessment may include penmanship, stacking ability, and performance of sequential, rapid, alternating movements such as touching the finger to the nose and then to the examiner's finger (smooth movement without tremors is the normal response). Fine motor coordination is crucial for academic success because children must be able to hold pencils and crayons, use scissors and rulers, and develop computer skills. The opportunity to practise these

skills through schoolwork and play is essential for the acquisition of coordinated, complex behaviours.

Other physical changes take place during the school years. Steady skeletal growth in the trunk and extremities occurs, and small- and long-bone ossification is present, but not complete by age 12 years. Dental growth is prominent during the school years. The first permanent or secondary teeth begin to erupt at approximately 6 years of age. Development of the permanent teeth has, however, been occurring for some time before eruption. The root of a primary tooth is absorbed, leaving the crown, which causes the tooth to become loose and fall out, making room for the permanent tooth. Eruption of secondary teeth usually begins with the 6-year molars, and the others follow the same order as with the primary teeth. By 12 years, all primary teeth have been shed, and the majority of permanent teeth have erupted. Infrequent or inadequate dental care remains a persistent problem for many children.

As skeletal growth progresses, body appearance and posture change. Earlier posture, which was characterized by a stoop-shouldered, slight lordosis and prominent abdomen, changes to a more erect posture. It is essential that children, especially girls after the age of 12 years, be evaluated for scoliosis, the lateral curvature of the spine.

Eye shape alters because of skeletal growth. This improves visual acuity, and normal adult 20/20 vision is achievable. Screening for vision and hearing problems is easier, and results are more reliable because school-age children can more fully understand and cooperate with the test directions. The public health nurse typically assesses the dental, visual, and auditory status of school-age children and refers those with possible deviations to their family practitioner or pediatrician.

Cognitive Changes

Cognitive changes provide school-age children with the ability to think in a logical manner and to understand the relationship between things and ideas (Hockenberry & Wilson, 2011). The thoughts of school-age children are no longer dominated by their perceptions, and thus their ability to understand the world greatly expands. At about seven years of age, children enter Piaget's (1952) third stage of cognitive development, known as **concrete operations**, in which they are able to use symbols to carry out operations (mental activities) in thought rather than in action. They begin to use logical thought processes with concrete materials (people, events, and objects they can touch and see).

Children in the concrete operational stage are considerably less egocentric than are younger children and develop the ability to concentrate on more than one aspect of a situation. School-age children now have the ability to recognize that the amount or quantity of a substance remains the same even when its shape or appearance changes. For instance, they can understand that two balls of clay of equal size retain the same amount of clay even when one is flattened and the other remains in ball shape.

The mental process of **classification** becomes more complex during the school years. Younger children can separate objects into groups according to shape or colour, whereas school-age children understand that the same element can exist in two classes at the same time. School-age children are becoming "thinkers" and are more capable of understanding another person's views and feelings (Santrock, 2007).

In middle childhood, youngsters can use their newly developed cognitive skills to solve problems. Some individuals are

better than others at problem solving because of intelligence level, education, and experience, but all children can improve these skills. Children who are good problem solvers demonstrate the following characteristics: a positive attitude that the problem can be solved with persistence, a concern for accuracy, the ability to divide the problem into parts for study, and the ability to avoid guessing while searching for facts. Adults can help children improve their problem-solving strategies by helping them define the problem, plan a solution, and then evaluate their solution. You can use these strategies to help hospitalized school-age children understand their illness and assume responsibility for their general health.

Language Development. Language growth is so rapid during middle childhood that these ages cannot be matched with language achievements. Children improve their use of language and expand their structural knowledge. They become more aware of the rules for linking words into phrases and sentences. They can also identify generalizations and exceptions to rules. They accept language as a means for representing the world in a subjective manner and realize that words have arbitrary, rather than absolute, meanings. They can use different words for the same object or concept, and they understand that a single word may have many meanings. Like younger children, school-age children watch parents and other adults to obtain clues about how to understand events (Santrock, 2007). Many school-age children use "bad language" to gain peer status and to shock adults. It often begins with bathroom language and progresses to sexual or genital words. Children begin to think about language, which enables them to appreciate jokes and riddles. Language acquisition is nurtured by social interactions with their parents and caretakers.

Psychosocial Changes

Erikson (1963) identified the developmental task for school-age children as industry versus inferiority (see Chapter 21). During this time, children strive to acquire competence and skills necessary for them to function as adults. School-age children who are positively recognized for success feel a sense of worth. Those faced with failure can feel a sense of unworthiness, which may result in withdrawal from school activities and peers.

Moral Development. The need for a moral code and social rules becomes more evident as school-age children's cognitive abilities and social experiences increase. For example, 12-year-old children are able to consider what society would be like without rules because of their ability to reason logically and their experiences with group play. They view rules as necessary principles of life, not just dictates from authorities. In the early school years, children strictly interpret and adhere to rules. As they grow older, their judgements become more flexible and they can evaluate rules for applicability to a given situation. School-age children consider motivations and behaviour when making judgements about the way their behaviours affect themselves and others. The abilities to be flexible when applying rules and to take the perspective of other people are essential in developing moral judgements. These abilities are present at times in earlier years but are more consistently displayed in later school years.

Peer Relationships. Group and personal achievements are important to school-age children. Success is important in physical and cognitive activities. Play involves peers and the pursuit of group goals. Although solitary activities are not eliminated, they are overshadowed by group play. Learning to



Figure 22-6 School-age children gain a sense of achievement by working and playing with peers. **Source:** Courtesy Elaine Polan, RNC, BSN, MS.

contribute, collaborate, and work cooperatively toward a common goal becomes a measure of success (Figure 22-6).

School-age children prefer same-sex peers to opposite-sex peers. In general, girls and boys view the opposite sex negatively. Peer influence becomes diverse during this stage of development. Conformity is evidenced in mannerisms, clothing styles, and speech patterns, which are reinforced and influenced by contact with peers. During this period, clubs and peer groups become prominent. Group identity increases as school-age children approach adolescence. Also, during the “tween” years (i.e., ages 8 to 12), children are increasingly exposed to social media. To help tweens and teens safely navigate the online social world, the American Academy of Pediatrics (2011b) recommends the following to parents:

- Learn about social media first-hand and monitor your child online.
- Require that you and your child “friend” each other.
- Speak to your child daily about his or her online habits.
- Place the home computer in a public room (e.g., family room).
- Emphasize that everything sent over the Internet and cell-phone can be shared with the whole world.
- Discourage children from gossiping, spreading rumours, or bullying.
- Set time limits for cellphone and Internet use.
- Be vigilant about warning signs of trouble, such as dropping grades, and skipping activities and homework for social media.
- Speak to your child about “sexting” in a manner that is appropriate to your child’s age.

Sexual Identity. Sigmund Freud described middle childhood as the latency period because he believed that children of this age had little interest in their sexuality. Today, many researchers believe that school-age children have a great deal of curiosity about their sexuality. Some may experiment, but this play is usually temporary. Children’s curiosity about adult magazines or meanings of sexually explicit words is also an example of their sexual interest. This is the time for children to have exposure to sex education, including information on sexual maturation, reproduction, and relationships (Edelman & Mandle, 2010).

Health Risks

Accidents and injuries are major health problems affecting school-age children. Motor vehicle accidents and accidents related to recreational activities or equipment are the leading causes of death or injury from the age of one year to adulthood (Edelman & Mandle, 2010). Unintentional injuries account for nearly half of all childhood deaths (Table 22-7).

Although falls account for a major portion of pediatric hospital admissions, they account for less than 5% of pediatric deaths resulting from injury. However, even though an accident may not result in death, it still can be a major cause of disability in children. More children die from automobile accidents than from all major preventable childhood diseases. The rates of injury and death have decreased since the institution of automobile child restraint laws.

School-age children are also significantly affected by respiratory illnesses, especially asthma, cancer, and heart disease (Hockenberry & Wilson, 2011). In this age group, these problems have a relatively low mortality rate, but a high morbidity rate in comparison with accidents. Cancers are the second leading cause of death in children 5 to 14 years of age (Hockenberry & Wilson, 2011). Leukemia is the most frequent type, and brain tumours and lymphoma are second and third, respectively.

Infections account for the majority of all childhood illnesses; respiratory infections are the most prevalent. The common cold remains the chief illness of childhood. Children living in poverty are more prone to disease and disability. Intellectual disabilities, learning disorders, sensory impairments, emotional difficulties, behavioural problems, and malnutrition are far more prevalent among children living in poverty (Campaign 2000, 2010).

Poverty and the prevalence of illness are highly correlated, probably because access to health promotion and preventive health care activities are minimal for children living in poverty. Poor nutrition and access to early intervention programs continue to be major health concerns for impoverished families. Education, social and health care reform, and environmental change are necessary to positively influence the health of children. Children’s developing cognitive and psychomotor skills make it possible for them to become more involved in health promotion and the management of chronic illness.

Health Concerns

During the school years, identity and self-concept become stronger and more individualized. School-age children are aware of their bodies and are sensitive about being exposed. Provide for privacy and offer explanations of common procedures. This approach helps foster children’s self-esteem and lessens their fear of pain and intrusion (Hockenberry & Wilson, 2011).

Health Education. The school years are crucial for the acquisition of behaviours and health practices for a healthy adult life. Because cognition is advancing during the period, effective health education must be developmentally appropriate. Promotion of good health practices is a nursing responsibility. A comprehensive school health approach includes programs, activities, and services that take place in schools and their surrounding communities in order to enable children and youth to improve their health and develop to their fullest potential (Canadian Association for School Health, 2007; Box 22-6).

► **TABLE 22-7** Injury Prevention for School-Age Children**Developmental Abilities
Related to Risk of Injury****Injury Prevention****Motor Vehicles**

Is increasingly involved in activities away from home
Is excited by speed and motion
Can be reasoned with
Does not always perceive injury risk
Is easily distracted by environment

Educate child regarding proper use of seat belts while a passenger in a vehicle.
Maintain discipline while a passenger in a vehicle (e.g., keep arms inside, do not lean against doors, do not interfere with driver).
Remind parents and children that no one should ride in the bed of a pickup truck.
Emphasize safe pedestrian behaviour.
Insist that child wears safety apparel (e.g., helmet) when applicable, such as when riding a bicycle or using a skateboard, all-terrain vehicle, or snow machine.

Drowning

Is apt to overdo activities
May work hard to perfect a skill
Is cautious but not fearful

Teach child to swim.
Teach basic rules of water safety.
Select safe and supervised places to swim.
Check sufficient water depth for diving.
Insist that child swims with a companion.
Use an approved flotation device in water or boat.
Learn cardiopulmonary resuscitation (CPR).

Burns

Demonstrates increasing independence
Enjoys trying new things

Make sure smoke detectors are in homes. Set hot water temperatures (49°C–54°C) to avoid scald burns.
Instruct child in behaviour in areas involving contact with potential burn hazards (e.g., gasoline, matches, bonfires or barbecues, lighter fluid, firecrackers, cigarette lighters, cooking utensils, chemistry sets).
Instruct child to avoid climbing or flying kites around high-tension wires.
Instruct child in proper behaviour in the event of fire (e.g., fire drills at home and school).
Teach child safe cooking (use low heat; avoid frying; be careful of steam burns, scalds, or exploding foods, especially in microwave ovens).
Teach children about the danger of fire, and instruct them that if their clothing is on fire, they should “stop,” “drop,” and “roll.”

Substance Abuse and Poisoning

May be easily influenced by peers
Has strong allegiance to friends

Educate child regarding hazards of taking nonprescription drugs and chemicals, including tobacco and alcohol.
Teach child to say no if he or she is offered illegal or dangerous drugs or alcohol.
Keep potentially dangerous products in properly labelled receptacles, preferably locked and out of child's reach.

Bodily Damage

Demonstrates increased physical skills
Needs strenuous physical activity
Is interested in acquiring new skills and perfecting attained skills
Is daring and adventurous, especially with peers
Frequently plays in hazardous places
Confidence often exceeds physical capacity
Desires group loyalty and has strong need for friends' approval
Attempts hazardous feats
Delights in physical activity
Is likely to overdo activity
Has growth in height that exceeds muscular growth and coordination

Help provide facilities for supervised activities.
Encourage playing in safe places.
Keep firearms safely locked up.
Teach proper care of, use of, and respect for devices with potential danger (e.g., power tools).
Teach children not to tease or surprise dogs, invade their territory, take dogs' toys, or interfere with dogs' feeding.
Teach safety regarding use of corrective devices (glasses); if child wears contact lenses, monitor duration of wear to prevent corneal damage.
Stress careful selection, use, and maintenance of sports and recreation equipment such as skateboards and in-line skates.
Emphasize proper conditioning, safe practices, and use of safety equipment for sports or recreational activities.
Caution against engaging in hazardous sports, such as those involving trampolines.
Use safety glass and decals on large glassed areas, such as sliding glass doors.
Use window guards to prevent falls.
Teach stranger safety.
Avoid personalized clothing in public places.
Caution child to never go anywhere with a stranger.
Have child tell parents if anyone makes child feel uncomfortable in any way.
Always listen to child's concerns regarding others' behaviour.
Teach child to say no when confronted with uncomfortable situations.
Help child avoid carrying more than 10%–15% of body weight in a backpack, and teach child to always put backpack on to evenly distribute weight; a light-weight backpack with wide shoulder straps, a waist strap, a padded back, and multiple compartments should be used.

► BOX 22-6

Critical Functions of Comprehensive School Health

A comprehensive approach to promoting health in schools includes the following:

- Promote healthy habits and illness prevention measures, with attention to multicultural, linguistic, physical, cognitive, and emotional factors.
- Intervene to assist children and youth who are in need or at risk.
- Help support children who are already experiencing poor health.
- Foster parental education on health issues.
- Identify learning disabilities early, and begin appropriate interventions to foster learning and self-esteem.
- Facilitate growth and self-actualization.
- Emphasize positive health attitudes.
- Foster positive life skills that enhance successful coping.
- Encourage physical activity.
- Encourage involvement of individuals, families, and communities as active partners in the health care of school-age children.

Adapted from Canadian Association for School Health. (2007). *Canadian consensus statement (Revised 2007): Comprehensive school health*. Retrieved from http://www.safehealthyschools.org/CSH_Consensus_Statement2007.pdf.

School-age children should receive age-appropriate sexual health education that begins before the onset of sexual activity (Kliegman et al., 2011). Other topic areas for elementary health education curricula include the promotion of adequate nutrition, oral hygiene, and regular health supervision. School-age children should also be educated about prevention of tobacco, drug, and alcohol use (Edelman & Mandle, 2010).

Instruct parents regarding health promotion appropriate for school-age children. Parents need to recognize the importance of annual checkups for immunizations, screenings, and dental care. When school-age children reach 10 years of age, it is recommended that their parents talk with the children about upcoming pubertal changes (Hockenberry & Wilson, 2011). Topics should include introductory information regarding menstruation, sexual intercourse, and reproduction. Provide age-appropriate written materials to aid parents in their efforts. The settings in which health promotion activities can occur are varied: the classroom, a school-based clinic, a community-based clinic, or community settings such as a public library or community centre.

Table 22-8 presents a list of possible health promotion topics for school-age children.

Safety. Because accidents are the leading cause of death and injury in school-age children, safety is a priority health teaching consideration. You can contribute to the general health of children by educating them about safety measures to prevent accidents. At this age, children should be encouraged to take responsibility for their own safety.

Nutrition. You can contribute to the promotion of healthy lifestyle habits, including nutrition. School-age children should participate in educational programs that enable them to plan, select, and prepare healthy meals and snacks. These foods should be consistent with the recommendations in *Canada's Food Guide* (Health Canada, 2007b), which include limiting intake of fats and increasing intake of complex carbohydrates, fruits, and vegetables. Box 22-7 outlines several learning activities appropriate for this age group. In addition, encourage daily physical activity for all children.

► TABLE 22-8

Health Promotion for School-Age Children**School-Age Health Concerns****Health Promotion Interventions**

Nutrition

Provide nutrition education that promotes healthy lifestyle: for example, limiting fat intake to 30% of calories, limiting saturated fat to 10% of calories, avoiding overeating.

Oral hygiene

Provide examples of low cariogenic snacks.
Review mechanics of dental hygiene: brushing, flossing.
Stress importance of biannual dental checkups.

Infections

Provide immunization information and follow-up.

Teach infection prevention practices (handwashing, care of minor skin injuries).

Teach concepts of viral and bacterial illness.

Promote handwashing and regular bathing.

Tobacco, alcohol, and drug use

Provide programs in preventing tobacco use.

Provide information regarding the hazards of alcohol and drug use.

Human sexuality

Provide information about sexual maturation and reproduction in age-appropriate manner.

Encourage parents to view their children's sexual curiosity as part of the developmental process.

Discuss with parents the learning needs of their children regarding sexuality.

Provide age-appropriate sexual health education.

► BOX 22-7

Interventions to Promote Education About Nutrition

Include healthy eating as part of the education programs at school.

- Make healthy foods available in school vending machines and at school sporting or other events.
- Encourage nutritious and nonfood items for school fundraising projects.
- Use positive messages to reinforce healthy eating and physical activity.
- Have teachers and school personnel model healthy eating habits.
- Limit access to unhealthy foods and beverages.
- Provide positive reinforcement for healthy food choices.
- Create a pleasant environment for eating.
- Promote safe food handling practices.
- Involve parents and the community in promoting healthy eating in schools.

Adapted from Knowledge Network. (n.d.). *Making it happen: Healthy eating at school*. Burnaby, BC: Author. Retrieved from <http://healthyeatingatschool.ca/>.

Growth may slow down during the school years in comparison with infancy and adolescence. Obesity is the most common nutritional problem during childhood. Obesity is believed to begin in utero and during infancy and childhood (Edelman & Mandle, 2010; Heindel, 2011). Obesity increases the risk for hypertension, diabetes, coronary heart disease, and psychosocial problems; some children with obesity have low self-esteem, poor body image, and reduced quality of life and interpersonal relationships (Sgenci & Faith, 2011). Obesity may occur because children often rush into the home after school or play and eat the most easily obtainable and appealing foods. Unfortunately, these foods are often high in calories and low in nutrition. Providing nutritious snacks is often the best way for a parent to ensure good nutritional intake. Caregivers should provide ready access to fresh fruit, raw vegetables, cheese, popcorn, and high-protein snacks such as skim-milk pudding and hot chocolate. Consider cultural, economic, and social issues when planning successful eating interventions (Edelman & Mandle, 2010).

Help families and children prevent obesity through proper nutrition and exercise. Many families often eat in fast-food restaurants in which the food is high in fat, calories, and salt. Encourage healthy food choices in these situations. Selections should include meats that are not breaded and are broiled, shakes that are made with low-fat yogurt or skim milk, and fruits and vegetables that are fresh or prepared in a low-calorie manner.

Adolescent

Adolescence is the period of development between childhood and adulthood, usually between 12 and 19 years of age. The term *adolescent* usually refers to psychological maturation of the individual, whereas *puberty* refers to the point at which reproduction becomes possible. The hormonal changes of puberty result in changes in the appearance of the young person: the primary sexual characteristic changes (maturation of the reproductive organs) and the secondary sexual characteristic changes (such as the development of pubic hair and female breasts). Mental development during puberty results in the ability to hypothesize and deal with abstractions. In addition, adolescents become much more social, and their behavioural patterns become much less predictable. Adjustments and adaptations are needed to cope with these simultaneous changes and the attempt to establish a mature sense of identity. Many people refer to adolescence as a stormy and stressful period filled with inner turmoil, but it is recognized that most teenagers successfully meet the challenges of this period. These challenges may cause adolescents to be moody and difficult. Within adolescence, three subphases exist: early adolescence, including puberty (ages 12 to 14 years), middle adolescence (ages 14 to 17 years), and late adolescence (ages 17 to 19 years). Opportunities, challenges, changes, skills, pressures, and physical, cognitive, and psychosocial development vary widely among the subphases (Table 22-9).

Your understanding of development provides a unique perspective for helping teenagers and parents anticipate and cope with the stresses of adolescence. Primary health care activities, particularly education, can promote healthy development. These activities occur in a variety of settings and can be directed at adolescents, parents, or both. For example, you can conduct seminars in a high school to provide practical suggestions for solving problems of concern to a large group

of students, such as treating acne or making responsible decisions about drugs or alcohol use. Similarly, a group education program for parents about how to cope with teenagers would promote parental understanding of adolescent development. These programs can be held in the school, clinic, private office, or community centre. To learn more about specific topics or problems, you need to identify teenagers' needs and desires. Involvement produces more active, interested learners.

Physical Changes

Physical changes occur rapidly in adolescence. Sexual maturation occurs with the development of primary and secondary sexual characteristics. Four main focuses of the physical changes are as follows:

- Increased growth rate of skeleton, muscle, and viscera
- Sex-specific changes, such as changes in shoulder and hip width
- Alteration in distribution of muscle and fat
- Development of the reproductive system and secondary sex characteristics

The timing of physical changes associated with puberty varies widely between sexes and within the same sex. Girls tend to begin their physical changes earlier than boys. Variations are more pronounced in boys (Kliegman et al., 2011). The sequence of pubertal growth changes is the same in most individuals (Table 22-10).

Changes are created by hormonal fluctuations within the body when the hypothalamus begins to produce gonadotropin-releasing hormones. This change sends the pituitary gland a signal to secrete gonadotropic hormones. Gonadotropic hormones stimulate ovarian cells to produce **estrogen** and testicular cells to produce **testosterone**. These hormones contribute to the development of secondary sex characteristics such as hair growth and voice changes and play an essential role in reproduction. The changing concentrations of these hormones are also linked to acne and body odour. Understanding these hormonal changes enables you to reassure adolescents and educate them about body care needs.

Boys who mature early have been shown by some researchers to be more poised, relaxed, good-natured, skilled in athletic activities, and likely to be school leaders than boys who mature late. In contrast, girls who mature early have been found to be less sociable and more shy and introverted, perhaps as a result of feeling conspicuous (Edelman & Mandle, 2010). Such girls are more conscious of body development, such as breast development, and thus stand out from many of their peers.

Being like their peers is extremely important for adolescents. You need to stress that normal sexual changes are quite variable. As with increases in height and weight, the pattern of sexual changes is more significant than their time of onset. Large deviations from normal patterns necessitate investigation.

Any deviation in the timing of the physical changes can be extremely difficult for adolescents to accept. Provide emotional support for those undergoing early or delayed puberty. Even adolescents whose physical changes are occurring at the normal times may seek reassurance about their normality.

Height and weight usually increase during the prepubertal growth spurt. The growth spurt for girls generally begins between 8 and 14 years of age. Height increases 5 to 20 cm, and weight increases by 7 to 25 kg. The growth spurt in boys usually occurs between 10 and 16 years of age. Height increases approximately 10 to 30 cm, and weight increases by 7 to 30 kg.

► **TABLE 22-9** Growth and Development During Adolescence

Early Adolescence (11-14 Years)	Middle Adolescence (15-17 Years)	Late Adolescence (18-20 Years)
Growth Rapidly accelerating growth reaches peak velocity. Secondary sex characteristics appear.	Growth decelerates in girls. Stature reaches 95% of adult height. Secondary sex characteristics are well advanced.	The body is physically mature. Structural and reproductive growth are almost complete.
Cognition The person explores newfound ability for limited abstract thought. The person experiences uncertainty when confronted with new values. One's "normality" is compared with that of peers of same sex.	Capacity for abstract thinking develops. Intellectual powers, often in idealistic terms, are increased. Concerns with philosophic, political, and social problems arise.	Abstract thought is established. The person can perceive and act on long-range options. The person is able to view problems comprehensively. Intellectual and functional identity are established.
Identity The person is preoccupied with rapid body changes. The person tries out various roles. Attractiveness is measured by acceptance or rejection by peers. Conformity to group norms is typical. Self-esteem declines.	Body image is modified. Person is very self-centred; narcissism is increased. Tendency toward inner experience and self-discovery develops. Fantasy life is rich. The person becomes idealistic. The person is able to perceive future implications of current behaviour and decisions; variable application.	Body image and gender role definition is nearly secured. Sexual identity is mature. Identity is consolidated. Self-esteem stabilizes. The person is comfortable with physical growth. Social roles are defined and articulated.
Relationships With Parents	Major conflicts over independence and control occur. This is the low point in parent-child relationship. The person makes the greatest push for emancipation and disengagement. Emotional detachment from parents is final and irreversible; mourning occurs.	Emotional and physical separation from parents is completed. Independence is achieved from family with less conflict. Emancipation is nearly secured.
Relationships With Peers	The person has a strong need for identity to affirm self-image. Behavioural standards are set by peer group. Acceptance by peers is extremely important; rejection is feared. The person explores ability to attract the opposite sex.	Peer group recedes in importance in favour of individual friendship. Male-female relationships are tested against possibility of permanent alliance. Relationships are characterized by giving and sharing.
Sexuality	Multiple plural relationships are characteristic. The person decisively turns toward heterosexuality, bisexuality, or homosexuality. "Self-appeal" is explored. Feeling of "being in love" is common. Relationships are tentatively established.	The person forms stable relationships and attachment to another person. Capacity for mutuality and reciprocity grows. Dating is common. The person may publicly identify herself or himself as gay, lesbian, or bisexual. Intimacy involves commitment rather than exploration and romanticism.

Continued

► **TABLE 22-9** Growth and Development During Adolescence—cont'd

Early Adolescence (11–14 Years)	Middle Adolescence (15–17 Years)	Late Adolescence (18–20 Years)
Psychological Health Wide mood swings occur. Intense daydreaming is characteristic. Anger is outwardly expressed with moodiness, temper outbursts, verbal insults, and name-calling.	Tendency toward inner experiences is exhibited; person becomes more introspective. The person tends to withdraw when upset or when feelings are hurt. Emotions vacillate in time and range. Feelings of inadequacy are common; asking for help is difficult.	The person experiences more constancy of emotion. Anger is more apt to be concealed.

Adapted from Hockenberry, M. J., & Wilson, D. (2011). *Wong's nursing care of infants and children* (9th ed., p. 740). St. Louis, MO: Mosby.

► **TABLE 22-10**

Average Sequences of Physiological Changes in Adolescence

Characteristics	AGE RANGE (YEARS)	
	Girls	Boys
Beginning of skeletal growth spurt	8–14.5 (peak: 12)	10.5–16 (peak: 14)
Beginning of breast development	8–13	—
Enlargement of testes and scrotal sac	—	10–13.5
Appearance of straight, pigmented pubic hair, which gradually becomes curly	8–14	10–15
Early voice changes (cracks)	—	11–14.5
Enlargement of penis and prostate gland	—	11–14.5
Menarche	10–18 (average: 12.25)	—
Spermatogenesis (ejaculation of sperm)	—	11–17 (average: 13.5)
Ovulation and completion of breast development	14–18 (average: 15.52)	—
Appearance of downy facial hair	—	12–17
Appearance of axillary (underarm) hair and increased output of oil and sweat-producing glands, which may lead to acne	10–16	12–17
Widening and deepening of female pelvis, with deposition of subcutaneous fat that gives rounded appearance to body	10–18	—
Increase in shoulder width	—	11–21
Deepening of male voice, with appearance of coarse and pigmented facial hair and appearance of chest and axillary hair as well as other body hair becoming more prominent, such as that on forearms and legs	—	16–21

In both sexes, the final 20% to 25% of adult height and 50% of adult weight are attained during this time (Hockenberry & Wilson, 2011).

Girls attain 90% to 95% of their adult height by **menarche** (the onset of menstruation) and reach their full height by 16 to 17 years of age, whereas boys continue to grow taller until 18 to 20 years of age. Fat is redistributed into adult proportions as height and weight increase, and gradually the adolescent torso takes on an adult appearance. Despite individual and sex differences, growth follows a similar pattern for both sexes. Growth in the length of the extremities occurs earliest, making the hands and feet appear very large and the legs very long; the individual often appears awkward and clumsy. At the same time, the lower jaw and nose become longer and the forehead higher and wider as the baby face of childhood disappears. Next, the thighs widen; then the shoulders broaden, and growth of the trunk proceeds. The female hips widen and the male shoulders broaden throughout adolescence.

Personal growth curves help you assess physical development. The individual's sustained progression along the curve, however, is more important than a comparison of measurements with the norm. To evaluate changes, you should chart growth measurements during routine health assessments.

Adolescents are sensitive about physical changes that make them different from peers. For this reason, they are generally interested in the normal pattern of growth and in their personal growth curves. Therefore, you should share this information to reassure adolescents that their own patterns are normal.

Cognitive Changes

According to Piaget (1952), the changes that occur within the mind and the widening social environment of adolescents result in the highest level of intellectual development, known as **formal operations** (see Chapter 21). However, without an appropriate educational environment, some people may not attain this stage. Those who are guided toward rational thinking may reach this stage early.

Adolescents develop the ability to determine possibilities, rank possibilities, solve problems, and make decisions through logical operations. The teenager can deal effectively with hypothetical problems. When confronted with a problem, the teenager is able to consider an infinite variety of causes and solutions. Adolescents can move beyond the physical or concrete properties of a situation and use reasoning powers to understand the abstract. School-age children think about what is, whereas adolescents can imagine what might be. These

newly developed abilities allow the individual to have more insight and skill in playing video games, computer games, and board games that necessitate abstract thinking and deductive reasoning about many possible strategies. A teenager can solve problems by simultaneously manipulating several abstract concepts.

Development of the ability to reason abstractly is important in the pursuit of an identity. For example, newly acquired cognitive skills enable the teenager to define appropriate, effective, and comfortable sex role behaviours and consider their impact on peers, family, and society. The ability to think logically about these behaviours and their outcomes encourages adolescents to develop personal thoughts and means of expressing sexual identity. In addition, because their level of cognitive functioning is higher, adolescents are receptive to more detailed and diverse information about sexuality and sexual behaviours. For example, sex education can include an explanation of physiological sexual changes and birth control measures.

By middle adolescence, an introspective quality emerges. At this time, adolescents believe that they are unique. They also may believe, because of their new physical skills, that they are invulnerable, and so they engage in risk-taking behaviours: many state that they “can drive fast and not get into an accident.” Other typical adolescent behaviours include self-consciousness and the desire for privacy.

The complex development of thought during this period leads adolescents to question society and its values. Although adolescents have the capability to think as logically as adults, they do not yet have experiences from which to gain perspective. It is common for teenagers to consider their parents too narrow-minded or too materialistic. This perception can result in conflicts between teenagers and parents. Cognitive abilities and performance vary greatly among adolescents. In fact, an adolescent may perform at different levels in different situations on the basis of past experiences, formal education, and motivation in the use of logic and effective deductive reasoning.

Language Skills. Language development is fairly complete by adolescence, although vocabulary continues to expand. The primary focus becomes communication skills that can be used effectively in various situations. Adolescents need to communicate thoughts, feelings, and facts to others. The skills used in communication situations are varied. Adolescents must select the person with whom to communicate, decide on the message, and choose the way to transmit the message. For example, the way teenagers tell parents about failing grades is not the same as the way that they tell friends. Adolescents develop different skills and styles of communication and learn how and when to use them most effectively. These diverse communication skills are used and refined throughout life (Santrock, 2007). Good communication skills are crucial for overcoming peer pressure and unhealthy behaviours. The following are some hints for communicating with adolescents:

- Do not avoid discussing sensitive issues. Asking questions about sex, drugs, and school demonstrates your interest in their well-being and may open the channels for further discussion.
- Ask open-ended questions.
- Try to discern the meaning behind their words or actions.
- Be alert to clues to their emotional state.
- Involve other individuals and resources when necessary.

Psychosocial Changes

The search for personal identity is the major characteristic of adolescent psychosocial development. Teenagers must establish close peer relationships or risk remaining socially isolated. Erikson (1963) viewed identity (or role) confusion as the prime danger of this stage and suggested that the cliquishness and intolerance of differences seen in adolescent behaviour are defences against identity confusion (Erikson, 1968). Adolescents work at becoming emotionally independent from their parents, while retaining family ties. In addition, they need to develop their own ethical systems that are based on personal values. Choices about vocation, future education, and lifestyle must be made. The various components of identity evolve from these stages and compose a total adult personal identity that is unique to the individual. Indecisiveness and the inability to make an occupational choice are behaviours indicating the lack of resolution to certain developmental tasks.

Gender Identity. Achievement of gender identity is enhanced by the physical changes of puberty. According to Freud, these physiological changes of puberty stimulate the libido, the energy source that fuels the sex drive (see Chapter 21). This change is evidenced by teenagers’ interest in romantic relationships and by their practice of masturbation. The physical evidence of maturity encourages the development of masculine and feminine behaviours. If these physical changes involve deviations, the person has more difficulty developing a comfortable sexual identity. Adolescents depend on these physical clues because they want assurance of maleness or femaleness and because they do not wish to be different from peers.

Other influences on gender identity are cultural attitudes and expectations of sex role behaviour and available role models. The masculine and feminine behaviours that teenagers see affect the way that they express sexuality.

Group Identity. Adolescents seek a group identity because they need esteem and acceptance (Figure 22-7). Similarity in dress, speech, or both is common in teenage groups. Popularity is a major concern for teenagers. Peer groups provide adolescents with a sense of belonging, approval, and the opportunity to learn acceptable behaviour. Popularity with both opposite-sex and same-sex peers is important. The strong need for group identity seems to conflict at times with the search for personal identity. It is as though adolescents require close bonds with peers so that they can later achieve a sense of individuality.

Family Identity. The movement toward stronger peer relationships contrasts with adolescents’ movements away from parents. Although financial independence for adolescents is not the norm in Canadian society, many adolescents work part-time, using their income to bolster independence. When adolescents cannot have a part-time job because of studies, school-related activities, and other factors, parents can provide allowances for clothing and incidentals, which encourage adolescents to develop decision-making and budgeting skills.

Some adolescents and families have more difficulty during these years than others. Adolescents need to make choices, act independently, and experience the consequences of actions. This testing, however, is best done against the background of firm family support. The family needs to allow independence while providing a haven in which adolescents can contemplate actions. Families unable to provide this support complicate movement toward identity formation. Health care support of a family and an adolescent may be essential to their success.

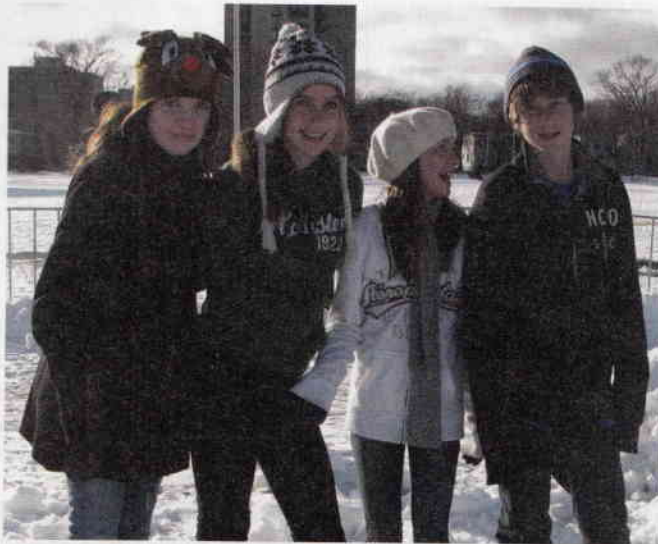


Figure 22-7 Social interactions strengthen a teenager's group identity. **Source:** Courtesy Cindy Murray, RN, PhD.

Assist families in considering ways that are appropriate for them to foster the independence of their adolescent while maintaining family structure. Many of these discussions involve curfews, jobs, and participation in family chores. Emancipation from the immediate family is most successful when accomplished gradually and results in a balance between independence and family ties.

Vocational Identity. Selecting an occupation or a vocational direction in life is a goal for adolescents. Because of society's changing needs, adolescents must be future oriented when making these choices. However, adolescents do not know which jobs will be available and rewarding 10 or 20 years in the future, and selecting a career is thus a complicated task. You need to be supportive to the family during this process and help adolescents select courses of action that promote self-satisfaction, identity, and continued opportunity for growth.

Moral Identity. The development of moral judgement depends heavily on cognitive and communication skills and peer interaction. Although moral development begins in early childhood, it is consolidated in adolescence because of the presence of certain skills. Adolescents learn that rules are cooperative agreements that can be modified to fit the situation, rather than absolute. Adolescents learn to use their own judgement rather than to use the rules to avoid punishment as in earlier years. Kohlberg (1964) explained moral development in terms of stages (see Chapter 21). At the highest level, morality is derived from individual principles of conscience. Adolescents judge themselves by internalized ideals, which often leads to conflict between personal and group values. Group values become less significant in later adolescence.

Not all adolescents attain the same level of moral development; however, they generally advance through the stages of moral development, and the sequence of the stages is similar for all individuals, even though the time at achievement varies. Kohlberg's (1964) moral development theory focuses on justice based on reciprocity and equal respect. Adolescent girls have been found to be more likely to give caring responses to moral problems, whereas adolescent boys have been found to give more justice-oriented responses (Gilligan, 1982).

Health Identity. Healthy adolescents evaluate their own health according to feelings of well-being, ability to function normally, and absence of symptoms (Hockenberry & Wilson, 2011).

Interventions to improve health perception might, therefore, concentrate on the adolescent period. The rapid changes during this period make primary health care programs especially crucial. Adolescents try new roles, begin to stabilize their identity, and acquire values and behaviours from which their adult lifestyle will evolve.

Health Risks

Injuries. Injuries, including self-inflicted injuries and injuries caused by motor vehicle accidents and poisoning, are the leading causes of death in Canadian adolescents (Pan et al., 2007). Feelings of being indestructible lead to risk-taking behaviour. Many injuries are preceded by the use of alcohol (Hockenberry & Wilson, 2011). Youths continue to be both the victims and perpetrators of violence.

Suicide. Suicide is increasing as a cause of death in adolescents between 15 and 19 years of age. Depression and social isolation commonly precede a suicide attempt, but suicidal thoughts probably result from a combination of several factors (Box 22-8).

You must be able to identify the factors associated with adolescent suicide risk and precipitating events. In addition, you should be alert to the following warning signs, which often occur for at least a month before suicide is attempted:

- Deterioration in school performance
- Social withdrawal
- Loss of initiative
- Loneliness, sadness, and crying
- Appetite and sleep disturbances
- Verbalization of suicidal thought

Immediate referrals to mental health providers are needed when assessment findings suggest that adolescents may be considering suicide. Guidance can help them focus on the positive aspects of life and strengthen coping abilities.

Substance Abuse. Adolescents may believe that mood-altering substances create a sense of well-being or improve

► BOX 22-8 Factors Associated With Suicide

History

Previous suicide attempt
Suicide attempt by family member or friend
History of child maltreatment
Past psychiatric hospitalization
Death of a parent when child was young

Individual Factors

Hopelessness
Marked, persistent depression
Alcohol or drug abuse
Impulsiveness
Difficulty tolerating frustration
Feelings of self-hatred, excessive guilt, or humiliation
Thinking disorder (wishes to join a deceased person, hears voices telling to kill self)
Physical, behavioural, developmental, or body image problems (delayed puberty, chronic illness, disability, attention deficit-hyperactivity disorder, learning disorders)
Gender identity or sexual orientation concerns; being gay, lesbian, bisexual, or transgender in an unsupportive environment
Seeing self as totally helpless: a victim of fate
Needing to do things perfectly

Family Factors

Difficult home situation: long, bitter parent-child conflict
Hostile parents
Overt rejection by one or both parents
Divorce or separation of parents
Recent or impending move
Family breakup or loss of parent
Stress of unrealistically high parental expectations
Parental indifference with very low expectations

Social and Environmental Factors

Firearms in the home
Incarceration
Lack of effective social support system
Isolation
Suicide of someone known
Few social, vocational, educational opportunities

Adapted from Hockenberry, M. J., & Wilson, D. (2011). *Wong's nursing care of infants and children* (9th ed., p. 836). St Louis, MO: Mosby.

level of performance. All adolescents are at risk for experimental or recreational substance use, but those with dysfunctional families are more at risk for chronic use and physical dependency. Some adolescents believe that substance use makes them more mature. They further believe they will look and feel better with drug usage. Alcohol is the substance most commonly used, followed by cannabis. Other substances frequently abused by teenagers include steroids, which are used to enhance athletic performances. It is believed that the use of these products may increase the likelihood of using other illicit drugs (Canadian Centre on Substance Abuse, 2010). Tobacco use, although decreasing, continues to be a problem among adolescents.

Eating Disorders. The number of eating disorders is on the rise in adolescents, particularly girls, and knowledge of growth progression may be a way to discourage radical weight

reduction activities. If an adolescent's growth deviates radically from the usual pattern, further assessment is necessary to identify the cause. Areas to include in the assessment are past and present diet history, food records, eating habits, attitudes, health beliefs, and socioeconomic and psychosocial factors (Hockenberry & Wilson, 2011). Weight extremes resulting from excessive or inadequate caloric intake are common during the adolescent years. Allowing an adolescent to see when and how the weight curve changed can be a first step in identifying the problem and implementing dietary changes.

Although anorexia nervosa and bulimia are classified as separate eating disorders, manifestations of the two overlap (Varcarolis & Halter, 2010). Anorexia nervosa is considered a clinical syndrome with both physical and psychosocial components. The majority of patients are adolescents and young women. Attending a highly competitive high school and being from a professional, upper-middle-class family increase the risk for this disorder. People with anorexia nervosa have an intense fear of gaining weight and refuse to maintain body weight at the normal minimum for their age and height.

Bulimia nervosa is most identified with binge eating and behaviours to prevent weight gain, including self-induced vomiting, misuse of laxatives and other medications, fasting, and excessive exercise (Hockenberry & Wilson, 2011). Because adolescents rarely volunteer information about behaviours to prevent weight gain, it is important to take a thorough dietary history. Society's expectations for thinness may have a strong influence on the development of these disorders. Eating disorders are thought to be more common among girls, but it is important to note that boys may also suffer from these disorders. Causes of eating disorders are the same for girls and boys.

Obesity and Physical Inactivity. Overweight and obesity, together with a decrease in physical activity, are becoming serious public health problems in Canada. In adolescents aged 12 to 17 years, rates of overweight have doubled and rates of obesity have tripled since the 1990s (Leitch, 2007). A contributing factor is a lack of physical activity; children and adolescents spend more time watching television and using computers, especially engaging in playing computer games. Parents and other people working with adolescents must encourage greater physical activity among this age group, must monitor computer use, and must promote healthy nutrition.

Sexual Experimentation. Sexual experimentation is common among adolescents. Peer pressure, physiological and emotional changes, and societal expectations contribute to early heterosexual and homosexual relations. Two prominent consequences of adolescent sexual activity are sexually transmitted infections and pregnancy (Hockenberry & Wilson, 2011).

Sexually Transmitted Infections. The incidence of sexually transmitted infections (STIs) reported is increasing in adolescents (Public Health Agency of Canada, 2008). Therefore, sexually active adolescents must be screened for STIs, even when they have no symptoms, because STIs can be asymptomatic. The annual physical examination of a sexually active adolescent should include a thorough sexual and genitourinary history and a careful examination of the genitalia so that genital warts, herpes, and other STIs are not missed. Recommended tests for women include Papanicolaou (Pap) smears, cervical cultures for gonorrhea and *Chlamydia* species, and syphilis tests; for men, urethral cultures for gonorrhea and

Chlamydia species and syphilis tests are recommended. If men have participated in homosexual activities, rectal and pharyngeal cultures also need to be taken to check for gonorrhea. Because the human papillomavirus (HPV) is a common STI, all Canadian provinces and territories have HPV vaccine programs, whereby adolescent girls are given a vaccine that is effective against some HPV viruses associated with cervical cancer (Public Health Agency of Canada, 2010). The health care provider can be proactive by using the patient interview process to identify risk factors in adolescents. Once identified, the risk factors should lead to strategies for prevention.

The human immunodeficiency virus (HIV), which causes acquired immune deficiency syndrome (AIDS), is transmitted through unprotected sexual intercourse, the use of shared needles, and infected blood products (see Chapter 26). Therefore, the risk-taking behaviours of sexual activity and drug use make adolescents vulnerable to the threat of AIDS and other STIs. Adolescents who have placed themselves at risk for AIDS should be tested for HIV infection. All adolescents need improved knowledge about HIV and AIDS.

Pregnancy. Adolescent pregnancy occurs across socioeconomic classes, in public and private schools, among all ethnic and religious backgrounds, and in all parts of the country. Adolescent pregnancy with early prenatal supervision is considered less physically harmful to both mother and child than earlier believed. Pregnant teenagers need special education about nutrition, as well as health supervision and psychological support.

Health Concerns

Adolescents must form healthy habits of daily living. You need to emphasize the importance of exercise, sleep, nutrition, and stress reduction and to identify ways to adapt them to each adolescent. To do this, you must assess the individual's positive and negative habits and attitudes about health. Extensive and long-term follow-up is required if individualized interventions are to succeed. You must be aware of the prevalence of health problems and make assessments accordingly.

Health Education. Community and school-based health programs for adolescents focus on health promotion and illness prevention. You can become involved in community health through screening and teaching programs (Table 22-11).

Through primary health care efforts in the school and community, you can contribute to improvements in the health of adolescents. Discussions with adolescents must be private and confidential. Adolescents must first feel comfortable and respected as individuals to reveal intimate information about their risk-taking behaviours. Developing and implementing programs to respond to adolescents' needs are important strategies. Helping adolescents make decisions about their health care strengthens their autonomy and promotes healthy behaviours.

You can play an important role in preventing injuries and accidental deaths. Important activities include injury prevention activities; support of organizations that promote responsible behaviour, including Mothers Against Drunk Driving (MADD) and Drug Abuse Resistance Education (DARE); and encouragement of students to participate in organizations such as Students Against Drunk Driving (SADD). By stimulating adolescents to discuss alternatives to driving when under the influence of drugs or alcohol, you prepare them to consider alternatives when such an occasion arises. You need to identify adolescents at risk for substance abuse, provide education to

► TABLE 22-11

Health Promotion for Adolescents

Adolescent Health Concerns

Unintentional injuries

Firearm use and violence
Tobacco, alcohol, and
drug use

Suicide

Sexually transmitted
infections

Health Promotion Intervention

Advise adolescent to take a driver's education course and to wear seat belts.
Inform the adolescent of risk associated with drinking and driving and with use of drugs.
Promote helmet use by adolescents who use bicycles, motorcycles, all-terrain vehicles, and snow machines.
Ensure adolescent receives proper orientation in the use of all sports equipment.
Encourage adolescent to swim with a "buddy."
Teach conflict resolution skills.
Screen for tobacco (including smokeless), alcohol, and drug use, and inform adolescent of the risks of use.
Offer suicide prevention information.
Teach methods of dealing with a suicidal peer.
Promote suicide alternatives.
Provide adolescent with information regarding disease, mode of transmission, and related symptoms.
Encourage safer sexual practices, including abstinence from sexual activity or the use of condoms.
Provide accurate information about the consequences of sexual activity.

prevent accidents related to substance abuse, and provide counselling to patients in rehabilitation programs.

You can play a strategic role in an antismoking movement. Smoking prevention programs can be initiated in schools. Communities can also play a role in creating tobacco control policies at the local level (Sen & Wirjanto, 2010).

You need to provide sex education and counselling. You can play a key role in counselling teenagers on ways to avoid pregnancies. You can also assist adolescents in making decisions about pregnancies that do occur (e.g., becoming a parent, adoption, or abortion). Some schools have instituted day care programs so that adolescent mothers can continue their schooling after their babies are born. Whatever choice an adolescent makes, it is important that she receive appropriate health care, including counselling.

Extensive educational efforts to prevent the spread of AIDS and other STIs in this age group are a nursing responsibility. Formal or informal education, in a one-on-one or group setting, may be provided in the school or community. Speakers and organizations can be used to help in the educational process.

Adolescents in Rural Communities. Approximately 20% of Canadians live in rural areas and small towns; however, this percentage varies by province and territory. Although

adolescents living in these areas have many of the same health needs as their urban counterparts, they also have some unique risks. For example, those living on farms are at increased risks for accidents because of exposure to heavy equipment, huge vehicles, and large animals (Safe Kids Canada, 2010). Other concerns for adolescents living in rural areas and small towns are limited availability of recreational facilities and limited access to specialized services.

You can play an important role in improving the health of adolescents who live in rural areas. You can address decreasing barriers to care, health promotion education, development of coping strategies, and assessment of health beliefs.

Minority Adolescents. By the next century, it is expected that minorities as a group will become the majority. Minority adolescents have been identified as experiencing a greater percentage of health problems and barriers to health care.

Issues of concern for minority adolescents living in a high-risk environment include learning or emotional difficulties, death related to violence (e.g., “honour killing” of a female relative on the perceived grounds that she has dishonoured the family [Amnesty International, 2010]), unintentional injuries, and increased rates of adolescent pregnancy and STIs, including AIDS. Poverty has a major negative effect on the lives of minority adolescents. Access to culturally appropriate health services is commonly limited. You can make a significant contribution to improving access to appropriate health care for adolescents. Health promotion initiatives must be based on topics of concern for these adolescents.

It is important when working in the community that you adopt culturally sensitive interventions to meet the needs of minority adolescents and their families (Hockenberry & Wilson, 2011). You must be able to communicate in another language by speaking it or using an interpreter’s services. Educational materials need to be written in the appropriate language. Information regarding health beliefs and healing practices must be assessed. With knowledge about various cultures and the means to care for minority adolescents, you act as an advocate to ensure accessibility of appropriate services.

Aboriginal Adolescents. Health status and factors affecting it are generally worse for Canadian Aboriginal adolescents (i.e., First Nations, Inuit, and Métis) than any other adolescent populations (Leitch, 2007). Suicide rates are higher among Aboriginal youth than among other youth in Canada, especially among boys (MacNeil, 2008). Aboriginal adolescents are more likely to have crowded living conditions and to live in communities in which alcohol abuse and substance abuse are high. Likewise, the incidence of unemployment and reported sexual and physical abuse is higher than in non-Aboriginal communities (Health Canada, 2010a). Some problems persist for Aboriginal peoples, such as overcrowded living conditions and high rates of unemployment, when they live in urban areas of Canada.

When working with Aboriginal adolescents, you need to be aware of the unique factors that may affect these young people’s health. First, you need to be aware that health beliefs and practices, as well as health problems, vary among Aboriginal populations and communities. You need to be sensitive to culturally appropriate interventions. Many Aboriginal communities take responsibility for their own health and well-being, develop their own health services, and include traditional methods of healing to improve well-being.

Lesbian, Gay, and Bisexual Adolescents. Although research on lesbian, gay, and bisexual youth is limited, special

consideration must be given to the developmental and health challenges that may result from sexual orientation and societal attitudes to those orientations (Hockenberry & Wilson, 2011). It may be difficult for adolescents to discuss some of these challenges because of the stigma associated with being lesbian, gay, or bisexual. As a consequence, lesbian, gay, or bisexual adolescents could be at greater risk for emotional distress, depression, and suicide, as well as for alcohol or other drug abuse. Lesbian, gay, and bisexual youth need assistance with disclosing their sexual orientation and, before they disclose this information, a plan for dealing with negative and sometimes violent reactions. It is important to respond to these individuals in a sensitive and nonjudgemental way.

✦ KEY CONCEPTS

- A developmental perspective helps you understand commonalities and variations in each stage and the impact they have on the patient’s health.
- During the intrauterine period, while embryo and fetus grow and develop, genetic factors and environmental factors (teratogens) may cause impairments in any body system.
- Physiological, cognitive, and psychosocial development continue from conception through adolescence, and you must be familiar with normal parameters to determine potential problems and promote normal development.
- Physical growth during the school years is slow and steady until the skeletal growth spurt just before puberty.
- The major psychosocial developmental task of school-age children is the development of a sense of competence.
- Cognitively, young school-age children develop the ability to think in a logical manner.
- The prepubertal growth spurt usually occurs two years earlier in girls than in boys.
- Adolescents move forward to the last stage of cognitive development, formal operations, in which they begin to think in an abstract manner, reflect on thought processes, and plan for the future.
- Adolescence begins with puberty, when the primary sexual characteristic changes (maturation of the reproductive organs) and the secondary sexual characteristic changes (such as the development of pubic hair and female breasts) begin.
- Adolescents are able to solve complex mental problems by using deductive reasoning.
- Adolescents’ rapid change in physical appearance heightens self-consciousness and concerns regarding body image.
- Accidents are the major cause of death in all age groups.
- Motor vehicle accidents are the major cause of accidental death in adolescence.
- Adolescents begin the long process of emancipation from their parents and need parental support to accomplish this in a timely manner.

✦ CRITICAL THINKING EXERCISES

1. Ms. Yeigh, who is in her first trimester of pregnancy, is attending the antepartum clinic for the first visit. What are the main health promotion topics you need to explore with her at this stage in her pregnancy?
2. The parents of two-year-old Mark are concerned because his language does not seem to be at the same level as that of their neighbour’s two-year-old daughter. How would you reassure these parents and help them with language development?

3. Eight-year-old Lisa sometimes says to her parents that she feels "like a failure." According to Erickson's task for this stage of development, what measures can her parents and teacher use to help negate these feelings and help her meet this stage of development?
4. Twelve-year-old Maya is brought to the pediatric clinic for a physical examination. She is concerned about her lack of physical development in comparison with her peers. Discuss ways to educate Maya about puberty and the variations that occur.
5. Fifteen-year-old Ricardo wants very much to belong and be accepted by his peers. He expresses concern when his peers begin to plan a party with alcohol and drugs. What should be discussed to help support his feelings and need to belong?

❖ REVIEW QUESTIONS

1. Maternal risk factors associated with preterm labour include
 1. Physiological stresses, such as renal disease
 2. Ethnicity
 3. Fetal infections
 4. Nutrition
2. During a postpartum home visit, the public health nurse notes that Isabella is breastfeeding, and inquires about any breastfeeding issues. Isabella states that breastfeeding is going well. The father of the baby shares that he often encourages Isabella and reminds her about the benefits of breastfeeding. In response, the nurse should
 1. Explain to the father that he is putting undue pressure on the mother
 2. Encourage the father to continue supporting the mother
 3. Explain to the father that he has no role in breastfeeding
 4. Explain to the father that his well-intentioned behaviour is adversely affecting Isabella's breastfeeding
3. The recommended age for beginning immunization for diphtheria and tetanus toxoids and acellular pertussis vaccine (DTaP) in healthy children is
 1. 18 months
 2. 2 months
 3. 12 months
 4. 4 months
4. A toddler pretends to shave after watching his father shave. This is an example of Piaget's
 1. Sensorimotor stage
 2. Intuitive phase of preoperational thought stage
 3. Autonomy stage
 4. Preoperational thought stage
5. The type of play characteristic of the early preschool years is
 1. Selfish
 2. Onlooker
 3. Associative
 4. Parallel
6. Preschoolers sleep an average of
 1. 8 hours a night and take frequent naps
 2. 12 hours a night and take infrequent naps
 3. 10 hours a night and take frequent naps
 4. 6 hours a night and take frequent naps

7. The school nurse observes bite marks and round burns on eight-year-old Emma's arms. Upon questioning, the child tells the nurse, "Oh, that's nothing. I fell off my bike." Which of the following is the nurse's priority action?
 1. Speak to Emma's teacher about the observed injuries.
 2. Meet with the school principal about the observed injuries.
 3. Discuss the injuries with Emma's parents.
 4. Report the incident to the authorities.
8. The most common nutritional disturbance of childhood is
 1. Obesity
 2. Anorexia nervosa
 3. Type 2 diabetes
 4. Bulimia
9. When you are communicating with adolescents, it is best to
 1. Avoid discussing sensitive issues, such as asking questions about sex and drugs
 2. Ask closed-ended questions to get straight answers
 3. Be alert to clues to their emotional state
 4. Avoid looking for meaning behind adolescents' words or actions
10. The leading cause of death in adolescence is
 1. Homicide
 2. Substance abuse
 3. Injuries
 4. Eating disorders

❖ RECOMMENDED WEB SITES

Campaign 2000: <http://www.campaign2000.ca>

Campaign 2000 is a nonpartisan, cross-Canada coalition of more than 120 national, provincial, and community organizations committed to working together to end child and family poverty in Canada.

Canadian Coalition for Immunization Awareness and Promotion: <http://www.immunize.cpha.ca/en/default.aspx>

The Canadian Coalition for Immunization Awareness and Promotion (CCIAIP) is a partnership of national nongovernmental, professional, health, consumer, government, and private-sector organizations focused on promoting the understanding and use of vaccines recommended by the National Advisory Committee on Immunization. This Web site provides evidence-informed resources on immunization for parents and health care providers.

Canadian Institute of Child Health: <http://www.cich.ca/>

The Canadian Institute of Child Health (CICH) is a national charitable organization dedicated to promoting the health of children and youth in Canada. The CICH works with government and industry to address children's safety and health care issues and develop appropriate policies. This Web site offers evidence-informed resources of interest to health care provider, teachers, and parents.

Canadian Paediatric Society: Position Statements: <http://www.cps.ca/English/publications/StatementsIndex.htm>

This Web site includes the Canadian Paediatric Society's position statements on a variety of child health issues. It has updates as they are developed.

Review Question Answers

1. 1; 2. 2; 3. 3; 4. 4; 5. 3; 6. 2; 7. 7; 8. 1; 9. 3; 10. 3

Rationales for the Review Questions appear at the end of the book.

Young to Middle Adulthood

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objectives

Mastery of content in this chapter will enable you to:

- Define the key terms listed.
- Discuss major life events and developmental tasks of young and middle-aged adults.
- Discuss the significance of family in the life of the adult.
- Describe normal physiological changes in young and middle adulthood, including pregnancy.
- Discuss cognitive and psychosocial changes that occur during the adult years.
- Describe health concerns of young and middle-aged adults.
- Apply clinical decision making to administer care to young and middle-aged adults.

key terms

Braxton-Hicks contractions, p. 366	Nesting, p. 366
Breastfeeding, p. 363	Peer navigator (doula), p. 364
Computer-mediated communication, p. 365	Perimenopause, p. 368
Erasure, p. 362	Prenatal care, p. 366
Infertility, p. 365	Puerperium, p. 366
Menopause, p. 368	Sandwich generation, p. 369

media resources

evolve WEBSITE

<http://evolve.elsevier.com/Canada/Potter/fundamentals/>

- Audio Chapter Summaries
- Examination Review Questions
- Glossary
- Student Learning Activities
- Weblinks

Young to middle adulthood is a period of challenges, rewards, and crises. Challenges may include the demands of working and raising families; rewards may include career, family, and personal successes; and crises may include job loss and caring for aging parents.

Adult developmental changes are unique to each individual. These changes are based on earlier characteristics and subsequent behaviours to adapt to these characteristics and new experiences. Young adulthood is the period between the late teens and the mid- to late 30s (Edelman & Mandle, 2010). Young adults constituted approximately 27% of the Canadian population in 2011 (Statistics Canada, 2012c). During young adulthood, individuals move away from their families of origin, establish career goals, and decide whether to marry and begin families or to remain single.

Middle age is the period between the mid- to late 30s and the mid-60s. During this period, people become aware of changes in reproductive and physical abilities

and may reassess life goals. In 2011, the median age of the Canadian population was 39.7 years of age and could rise to 44 years by 2040. This age group is growing because the baby-boomer generation is maturing and fertility rates in recent decades have declined (Statistics Canada, 2011).

Developmental theories provide you with a basis for understanding the life events and developmental tasks of young and middle-aged adults. Developmental theorists Erikson (1963, 1982), Havighurst (1972), and Gilligan (1993) described the phases of adulthood and related developmental tasks (see Chapter 21).

You may be a young or middle-aged adult yourself, coping with the demands of your respective developmental period. You must be careful to recognize and respect the needs of your patients even if you are not experiencing the same challenges and events. You can help young and middle-aged adult patients achieve their potential by offering support and providing information and appropriate referrals.

Young Adulthood

Physical Changes

Most young adults have completed physical growth by the age of 20 years. Young adults are usually quite active, experience fewer severe illnesses than do older age groups, tend to ignore physical symptoms of illness, and often postpone seeking health care. Physical characteristics of young adults begin to change as middle age approaches.

Patients in this developmental stage may benefit from a personal lifestyle assessment to identify habits that increase the risk for cardiac, malignant, pulmonary, renal, or other chronic diseases. A personal lifestyle assessment of the young adult includes assessment of general life satisfaction; hobbies and interests; habits (e.g., diet, sleep, exercise, sexual practices, caffeine use, alcohol, illicit drugs); home conditions (e.g., housing, finances); and occupational environment (e.g., type of work, exposure to hazardous substances, physical or mental strain).

Cognitive Changes

Cognitive changes are variations in reasoning and thinking. Critical thinking habits increase steadily through the young and middle adult years. Formal and informal education, life experiences, and work opportunities increase the individual's conceptual and problem-solving skills. Young adults with flexible decision-making processes cope most effectively by continually evolving and adjusting to changes in their home, workplace, and personal lives.

Choosing an occupation is a major task of young adults and involves knowing their skills, talents, and personality characteristics. The lack of resources or support systems to pursue higher education or develop work skills may limit occupational choices for many young adults.

By understanding how adults learn, you can develop teaching plans (see Chapter 20). Adults enter learning situations with a background of unique life experiences, including illness. Therefore, you should always view each adult as an individual. When determining what amount of information the individual needs to make decisions about the prescribed course of therapy, you should consider factors that may affect the individual's adherence to the regimen, including educational level, socioeconomic factors, social context factors (Phillips, 2011), motivation, and desire to learn.

Psychosocial Changes

The emotional health of young adults is related to their ability to address and resolve personal and social tasks. Young adults often want to prolong adolescence and yet assume adult commitments. Between the ages of 23 and 28 years, people usually refine self-perception and capacity for intimacy. From ages 29 to 34 years, people usually focus on achieving personal and occupational goals and improving socioeconomic status. For many young adults, a dual-income family is needed to achieve and maintain middle-class status. Career and personal counselling can help individuals identify career choices and set realistic goals.

Ethnicity and gender issues influence an adult's life and can pose challenges for nursing care. Each person holds culture-bound definitions of health and illness. An understanding of ethnicity, race, and gender differences enables you to provide individualized care (see Chapter 9). Traditional gender roles of men and women have changed and have resulted in alterations in traditional familial structures. Since the 1970s, women have been entering the workforce and pursuing careers in high numbers. About 62% of Canadian women aged 15 years and older are in the labour force (Statistics Canada, 2012e). Women contribute significantly to their families' incomes. As a result, many women deal with the stresses of being wife, mother, and employee. Likewise, men are assuming more parental and household responsibilities (Austin & Boyd, 2010). Some men choose to put careers on hold to be stay-at-home fathers. Challenges may arise for young adults who do not conform to traditional gender roles. Gay, lesbian, bisexual, intersex, transgender, Two Spirit, queer, and questioning persons may face challenges in navigating the health care system and social context to lead happy and healthy lives (Phillips & Saewyc, 2010). For transgender persons, this may be particularly challenging due to "erasure"—the social process through which transsexuality is managed in cultures and institutions as being ultimately impossible (Bauer et al., 2009; Namaste, 2000). **Erasure** describes how sexual minority identities are systematically "erased" from heteronormative society by allowing only gender binary (male/female) on health records and other documents; in a society, transgender persons are systematically erased (Bauer et al., 2009; Namaste, 2000). For other sexual minorities, the common use of the epidemiological categories of men who have sex with men (MSM) and women who have sex with women (WSW) serves to "erase" the existence of gay and lesbian communities (Boellstorff, 2011; Prestage, 2011; Young & Meyer, 2005). "Two Spirit is a term used to describe Aboriginal people who assume cross-, or multiple gender roles, attributes, dress and attitudes for personal, spiritual, cultural, ceremonial, or social reasons. These roles are defined by each [Aboriginal] cultural group and can be fluid over a person's lifetime. Modern terms like gay, lesbian, bisexual, transgender (GLBT), transsexual and intersexed (in combination with, or exclusive to, Two Spirit) may be adopted by some Aboriginal people to define who they are" (Manitoba Health, 2004, p. 47).

Career. Young men and women hope to have fulfilling careers. They may formulate short- and long-term career goals. Successful employment ensures economic security and promotes friendships, social activities, support, and self-respect.

In many two-career partnerships, the benefits experienced (e.g., improved finances) may outweigh potential stressors (e.g., child care demands; household needs; increased physical, mental, or emotional demands). To reduce stress in a two-career family, neither partner should assume all household

responsibilities. For some families, a solution is to hire a housekeeper. Others may set up an equal division of household and child care duties.

Sexuality. Young adults usually have the emotional maturity necessary to establish intimacy and develop fulfilling sexual relationships. Young adults who have failed to achieve the developmental tasks of adolescence may develop superficial relationships (Austin & Boyd, 2010).

For most young adults, the emotional aspect of sexual activity is as important as its type or frequency. Understanding the differences between sexual desire (i.e., responses to physical and mental stimuli during or in anticipation of sexual activity), sexual behaviour (i.e., how humans experience and express their sexuality), and sexual identity (i.e., how a person identifies their sexuality) will facilitate your work with young adult patients (Wolitski et al., 2007). Recognizing the distinct differences between each and how they are influenced by internal and external factors will facilitate open dialogue and collaborative approaches to patient teaching about sexual health. This open dialogue will reduce potential sexual health risks, including HIV and other sexually transmitted infections (Phillips & Saewyc, 2010). Adults should be encouraged to explore various aspects of their sexuality and be aware that their sexual needs and concerns evolve (see Chapter 26).

Singlehood. Social pressure to get married is not as great as it once was. During the 2006 to 2011 census period, families and living arrangements among Canadians continued to diversify. Married families accounted for two-thirds of all families. Common-law couples and lone-parent families increased, and for the first time, common-law couples outnumbered lone-parent families. The 2011 census cycle is the first full cycle in which all areas of Canada recognized same-sex marriage, and the number of same-sex marriages increased by 42% between 2006 and 2011 (Statistics Canada, 2012b). Young adults who choose to remain single and maintain independence may consider siblings and parents as their family. However, close friends and associates may also be viewed as the individual's "family." Some singles choose to become parents, either biologically or through adoption.

The single population is increasing partly because women have greater career opportunities than before and partly because single individuals often choose to live together and share housing costs rather than marry. In addition, many adults become single again after a marriage ends.

Marriage. Every married couple's relationship is unique, regardless of the gender makeup of the couple. Although no rules guarantee a successful marriage, some guidelines are useful for building a happy marriage. Before marriage, the couple ideally should (1) ensure that their emotions are based on love rather than physical attraction, (2) explore their motivations for marriage, (3) develop clear communication, (4) accept that behaviour and habits are unlikely to change after marriage, and (5) determine their compatibility in important beliefs and values.

When establishing a household and family, the married couple must work as a team. Individuals require maturity and self-esteem to accomplish the following major tasks of marriage: establishing an intimate relationship; deciding on and working toward mutual goals; establishing guidelines for decision-making issues; setting standards for social interactions; and choosing morals, values, and ideologies acceptable to both. Accomplishing these tasks provides the foundation for a stable relationship.

* BOX 23-1

FOCUS ON PRIMARY HEALTH CARE

Preparation for Parenthood

Preparing for child-bearing and parenthood involves many decisions and choices for the child-bearing family. These include the decision to have a baby and the choices of health care provider, place of birth, how to obtain information and prepare for child-birth, and how to feed and care for the newborn.

In a hospital or community prenatal clinic, you have many opportunities to assist the child-bearing family by providing information that aids decision making. You may help families to seek preconceptional counselling for known or suspected health risks that might affect the mother or fetus during pregnancy. You may also refer families to other health care providers for unique concerns. By providing a list of questions that could be asked of a health care provider on a first visit, you may encourage expectant parents to select a health care provider with whom they will be comfortable and who will meet their needs.

Prenatal education programs offered by hospital and community nurses and by midwives provide information about coping strategies and support during pregnancy, labour, and the early postpartum period. Classes specifically about preparation for Caesarean birth or for siblings and grandparents may also be available. Prenatal education programs should be structured to meet the unique needs, goals, and learning styles of the expectant family.

Adapted from Olds, S. B., London, M. L., Ladewig, P. A., & Davidson, M. R. (Eds.). (2004). *Maternal-newborn nursing and women's health care* (7th ed., pp. 285–293). Upper Saddle River, NJ: Pearson Prentice Hall.



Marriage also requires the couple to learn patterns of sexual expression, establish roles, and practise effective conflict resolution and decision-making skills. Each partner may experience a sense of loss of individuality in the transition from being single to being married.

Child-Bearing Cycle. Conception, pregnancy, birth, and the puerperium (postpartum period) are phases of the child-bearing cycle. The changes during these phases are complex (Box 23-1). Childbirth education classes can prepare the pregnant woman, her partner, and other supportive people to participate in the birthing process. Pregnant women and their families may benefit from a lay doula (support person).

Breastfeeding offers many advantages to both the new mother and baby (see Chapter 42). However, for the inexperienced mother, breastfeeding may cause anxiety and frustration. Women who have had no contact with newborns and other mothers who breastfeed may require assistance to breastfeed successfully. You must be alert for signs that the mother needs information and assistance. By observing the mother while she breastfeeds, you may catch problems such as improper positioning or ineffective sucking by the infant (Registered Nurses' Association of Ontario, 2003).

The personal and social changes occurring in the lives of a couple after the birth of a baby cannot be underestimated. Nursing assessment of the couple's response to the birthing experience and parent-child attachment are discussed later in this chapter.

Parenthood. Contraception allows couples to decide when and whether to start a family. One factor influencing this decision is the reason for wanting a child. Social pressures may encourage a couple to have a child or may influence them to

► BOX 23-2 Ten Hallmarks of Emotional Health

- A sense of meaning and direction in life
- Successful negotiation through transitions
- Absence of feelings of being cheated or disappointed by life
- Attainment of several long-term goals
- Satisfaction with personal growth and development
- When married, feelings of love for partner; when single, satisfaction with social interactions
- Satisfaction with friendships
- Generally cheerful attitude
- Acceptance of constructive criticism
- No unrealistic fears

limit the number of children they have. Economic considerations frequently enter into the decision because raising children is expensive. Because couples are getting married later and are postponing pregnancies, general health status and age are also factors in whether a couple decides to have children.

Parenting roles must be defined and practised. Nurturing and socialization needs of children can put pressure on the couple's intimate relationship. In addition, parents' images of the "perfect parent" may conflict with reality.

Alternative Family Structures and Parenting.

Norms and values about family life in Canada continuously evolve, as demonstrated by judicial rulings on same-sex marriage since 2000. Greater numbers of infants are born to cohabiting (common-law) couples (see Chapter 19). Families may include single parents, same-sex couples, or be combined from previous relationships. Parents from alternative family structures may perceive lack of support and bias from the health care system (McManus et al., 2006). Same-sex parents and their children may need support for adoption of children and the parenting role.

Hallmarks of Emotional Health

Most young adults have the physical and emotional resources and support systems to meet their many challenges, tasks, and responsibilities. During psychosocial assessment of young adults, you can assess for 10 hallmarks of emotional health that indicate successful maturation in this developmental stage (Box 23-2). If one or more of these hallmarks are not attained, further assessment and action may be required.

Social Support in Health and Illness

A current trend in health care is the use of **peer navigators** to facilitate well-being (Figure 23-1). This trend is evident in states of health when a family uses the services of a **doula** to help a pregnant woman and her family to navigate the challenges of pregnancy. In chronic disease states such as cancer, mental illness, and HIV disease, peer navigators can help patients to navigate the complexities of the health care system and therapeutic regimens (Box 23-3).

Health Risks

Health risk factors for a young adult originate in lifestyle patterns, family history, and the environment and occupation.

Lifestyle. Lifestyle habits such as poor food choices, smoking, stress, high-risk sexual behaviour, substance abuse, and inactivity increase the risk of illness. For example, prolonged stress can cause ulcers, emotional disorders, and infections (see Chapter 29). Smoking and second-hand smoke



Figure 23-1 A peer navigator and patient discuss medication adherence strategies.

* BOX 23-3 RESEARCH HIGHLIGHT

Peer Navigators: Social Support During Health Challenges

Research Focus

The importance of social supports for managing health and illness are gaining momentum. For example, Wittenberg et al. (2010) studied the relationships between marital status, distress, and well-being among women newly diagnosed with breast cancer and their peer navigators.

Research Abstract

The purpose of Wittenberg et al.'s study was to describe the effect of marital status on changes in distress and well-being among women who were newly diagnosed with breast cancer and their cancer survivor peer navigators. The peer navigator provided one-on-one peer counselling for three to six months. Findings indicated that married or partnered women newly diagnosed with breast cancer experienced the added benefit of social support from their partner and their peer navigator. The women experienced reductions in depressive symptoms and improvements in emotional well-being. Peer navigators were observed to have better well-being with continued training and additional support. This study reinforces the importance of social supports for managing illness such as breast cancer.

Evidence-Informed Practice

- Provision of ongoing training and support to peer navigators is important for their continued well-being.
- Single or not-married peer navigators may re-experience trauma if they do not have adequate social support.
- Women diagnosed with breast cancer that are not married or partnered require additional support and a peer navigator may help reduce depressive symptoms.

Reference: Wittneberg, L., Yutsis, M., Taylor, S., Giese-Davis, J., Bliss-Isberg, C., Star, P., & Spiegel, D. (2010). Marital status predicts change in distress and well-being in women newly diagnosed with breast cancer and their peer counselors. *Breast Journal*, 16(5), 481–489.

can cause lung cancer and pulmonary, cardiac, and vascular diseases. **Computer-mediated communication** (e.g., Internet dating, “sexting”) can lead to high-risk sexual encounters and adverse health outcomes (Phillips & Saewyc, 2010). Your role in health promotion is to identify lifestyle risk factors and provide education and support to reduce unhealthy behaviours.

Family History. A family history of a disease may put a young adult at risk for developing that disease in the middle or older adult years. For example, a family history of certain cancers or cardiovascular, renal, endocrine, or neoplastic disease increases the family member’s risk of developing the disease.

Accidental Death and Injury. Accidents are the leading causes of injury and death in young adults (Lewis et al., 2010). Death and injury can result from motor vehicle or other accidents, physical assaults, and suicide attempts. Among 19- to 24-year-olds, the leading causes of death in 2009 were accidents and intentional self-harm (suicide) (Statistics Canada, 2012f). They also may cause permanent disability.

Physical assault and violence may also cause injury or death. Factors that may predispose to violence include poverty, breakdown of family relations, child abuse and neglect, and access to firearms. To detect personal and environmental risk factors for violence, it is important that you perform a thorough psychosocial assessment, including such factors as behaviour patterns, history of physical abuse and substance abuse, education, work history, and social support systems.

Substance Abuse. Substance abuse directly or indirectly contributes to mortality and morbidity in young adults. Regular heavy drinking (five or more drinks on one occasion) is most common among Canadians aged 20 to 34, and twice as many men in this age group drink compared to women in the same age range (Statistics Canada, 2012d). Intoxication is often a factor in motor vehicle accidents.

Dependence on stimulants (“uppers”) can result in overdose death by putting stress on the cardiovascular and nervous systems. Use of depressants (“downers”) can lead to accidental or intentional overdose and death. You can provide counselling and support for patients seeking treatment for substance abuse.

Substance abuse cannot always be diagnosed, particularly in its early stages. Nonjudgemental questions about use of legal drugs (prescribed drugs, over-the-counter drugs, tobacco, and alcohol), so-called soft drugs (marijuana), and illegal drugs (cocaine or heroin) should be a routine part of any physical assessment. Important information may be obtained by making specific inquiries about past medical problems, changes in food intake or sleep patterns, or problems of emotional lability. Reports of arrests because of driving while intoxicated, because of domestic or child abuse, or because of disorderly conduct should alert you to the possibility of drug misuse or abuse.

Unplanned Pregnancies. Unplanned pregnancies, although more common among adolescents, also occur in young and middle-adult Canadian women. Unplanned pregnancies are a source of stress that can result in adverse health outcomes for the mother, infant, and family. Many young adults have educational and career goals that take precedence over family development. Interference with these goals can affect future relationships and later parent-child relationships. When assessing the woman with an unplanned pregnancy, determination of the situational factors that affect pregnancy outcome is important. These include exploring issues such as

family support systems; potential parenting disorders; depression; coping mechanisms; and possible financial, career, or housing problems.

Sexually Transmitted Infections. Sexually transmitted infections (STI) are a major health problem in young adults (Public Health Agency of Canada, 2010; Society of Obstetricians and Gynaecologists of Canada, 2006). STIs include syphilis, chlamydia, gonorrhea, genital herpes, human papilloma virus (HPV) infection, and human immunodeficiency virus (HIV) disease (see Chapter 26). STIs have immediate physical effects such as discharge and discomfort. STIs also can lead to chronic disorders (from genital herpes), infertility (from gonorrhea), or death. Many people have an STI without experiencing symptoms. Young adults need information about transmission, prevention, symptoms, and management of STIs.

Many young adults have misconceptions regarding transmission and treatment of STIs. Partners are encouraged to know one another’s sexual history and sexual practices. You should be alert for STIs when patients come to clinics with complaints of urological or gynecological problems (see Chapter 31). Young adults should be assessed for their knowledge and use of safer sex practices and genital self-examinations.

Environmental or Occupational Factors. A common environmental or occupational risk factor is exposure to work-related hazards or agents. Diseases observed in workplaces include silicosis from inhalation of talcum and silicon dust, emphysema from inhalation of smoke, and hearing loss from noise exposure. Cancers resulting from occupational exposures may involve the lungs, liver, brain, blood, or skin. Environmental exposures with leisure activities include outdoor exposure to mosquitoes (which may transmit West Nile virus) and ticks (which may transmit Lyme disease). Questions regarding environmental and occupational exposures should be a routine part of your assessment.

Health Concerns

Infertility. Infertility refers to a lack of conception after a reasonable period of sexual intercourse without contraception (Assisted Human Reproduction Canada, 2010). Infertility affects as many as one in eight couples. For many couples, the use of infertility clinics can facilitate pregnancy. The cause of infertility is unknown in about 20% of affected couples. Female factors, such as ovulatory dysfunction or a pelvic factor, and male factors, such as sperm and semen abnormalities, are responsible for about 80% of cases of infertility (Breslin & Lucas, 2003). Couples who delay conception until their mid-30s may experience fertility problems. For some infertile couples, you may be the first resource contacted. Nursing assessment of infertile couples should include comprehensive histories of both partners to determine factors that may affect fertility, as well as pertinent physical findings (Lowdermilk et al., 2011).

Exercise. Exercise patterns can affect health status. Exercise three times a week that produces a sustained increase in the pulse rate for 15 to 20 minutes improves cardiopulmonary function by decreasing blood pressure and heart rate. In addition, exercise decreases fatigue, insomnia, tension, and irritability. You should conduct a thorough musculoskeletal assessment, including evaluations of joint mobility and muscle tone, and a psychosocial assessment for improved tolerance of stress to determine the effects of exercise.

Routine Health Screening. Routine screening examinations lower the risk for severe illnesses and enable early detection. Patients should be encouraged to perform monthly

skin, breast, or male genital self-examination (see Chapter 31). In Canada, cancer is the leading cause of death; lung and colorectal cancer are the most prevalent. The highest incidence of cancer is among persons over the age of 50, but cancer contributes to illness and death in young and middle-aged adults (Canadian Cancer Society's Steering Committee, 2010). Breast and male genital cancers continue to be considerable issues in Canada. Therefore, your role is extremely important in educating patients about breast self-examination and the current breast screening recommendations, and you must provide male patients with information about testicular self-examination and prostate cancer screening. In adolescence and early adulthood, prolonged exposure to ultraviolet rays from the sun or in tanning salons can increase the risk for development of skin cancer. Encourage patients to undergo routine assessment of the skin for changes in colour or presence of lesions and changes in their appearance. Persons living with chronic conditions such as cancer, diabetes mellitus, or HIV may require specific condition-related screenings on a routine basis (Figure 23-2).

Job Stress. Job stress can occur every day or periodically. Most young adults are able to handle day-to-day crises. Situational job stress may occur when a new boss enters the workplace, a deadline is approaching, or the worker is given new responsibilities. Corporate restructuring may lead to layoffs and increased responsibilities for remaining employees and is a major source of stress. Job stress also occurs when a person becomes dissatisfied with a job. Because individuals perceive jobs differently, the types of job stressors vary from person to person. Your assessment of the young adult should include a description of the adult's work, including conditions and hours, duration of employment, changes in sleep or eating habits, and evidence of increased irritability or nervousness.

Family Stress. Family stressors can occur at any time in family life. Family life is a dynamic process that includes times when everyone in the family works together and times when everyone appears to pull apart. Situational stressors occur during events such as births, deaths, illnesses, marriages, and job losses. Because of changing relationships and structures in the emerging young adult family, stress levels are frequently high and may be related to a number of variables that may

lead to family dysfunction. Stress and the possible resulting family dysfunction may account for high divorce rates during the first three to five years of marriage for young adult couples. When a patient seeks health care and exhibits stress-related symptoms, you should ask whether the person has recently experienced a life-changing event.

Each family has certain predictable roles or jobs for members. These roles enable the family to function and be an effective part of society. One necessary role is the family leader. In most families, one parent is the leader or both parents act as co-leaders. In lone-parent families, the parent or, on occasion, a member of the extended family is the family leader. When this role changes as a result of illness, a situational crisis may occur. You should assess environmental and familial factors, including support systems and coping mechanisms commonly used by family members.

Pregnancy. Although the physiological changes of pregnancy and childbirth occur only in women, cognitive and psychosocial changes and health concerns affect the entire child-bearing family (Somers-Smith, 1999). The entire family, therefore, needs education about pregnancy, labour, delivery, breastfeeding, and integration of the newborn into the family structure.

Women and men who are anticipating pregnancy benefit from good health practices before conception, including eating a balanced diet, exercising, attending regular dental checkups, and avoiding alcohol, drugs, and smoking. Women trying to become pregnant should not follow weight-reduction diets.

Prenatal Care. Prenatal care includes routine assessment of the pregnant woman by a nurse, family physician, obstetrician, nurse practitioner, or midwife. Health promotion interventions are important during the prenatal period and can improve the well-being of the woman and fetus (Box 23-4). Prenatal care includes a thorough physical assessment of the pregnant woman during regularly scheduled intervals; provision of information regarding STIs, vaginal infections, and urinary infections that could adversely affect the fetus; and counselling about exercise patterns, diet, and child care. Regular prenatal care can address health concerns that arise during the pregnancy.

Physiological Changes. The physiological changes and needs of the pregnant woman vary with each trimester (Table 23-1). Temporary changes in visual and hearing acuity, taste, and smell also occur. You must be familiar with these physiological changes, their causes, and helpful interventions. All women experience some physiological changes in the first trimester, but some changes affect only certain women. During the second trimester, growth of the uterus and fetus results in some of the physical signs of pregnancy, and the woman will see her growing abdomen and feel fetal movements. During the third trimester, irregular, short contractions (**Braxton-Hicks contractions**), fatigue, and urinary frequency may occur. Close to the onset of labour, the woman may experience a burst of energy during which she prepares for the baby's arrival, a period called **nesting**.

The **puerperium** is a period of approximately six weeks after delivery. During this time, the woman's body reverts to its prepregnant physical status. You should assess the woman's knowledge of and ability to care for both herself and her newborn. Assistance with infant feeding and care and assessment of parenting skills and mother-infant interactions are particularly important (Dunn et al., 2006). During this period, you should assess for postpartum depression, which may



Figure 23-2 Routine health screening for persons living with chronic conditions.

BOX 23-4 NURSING STORY

Support During Pregnancy

Melinda was a 24-year-old woman pregnant with her first child. Her pregnancy was healthy and the fetus appeared to be growing well. Beginning in her sixth month of pregnancy, she enrolled in childbirth education classes, taught by a community health nurse. The nurse noticed that Melinda's boyfriend, Troy, accompanied her to the first class. During the second class, the nurse observed that Melinda was by herself and appeared a bit withdrawn. Concerned about whether Melinda would have adequate support during labour and birth, the nurse asked Melinda whether Troy was going to be coming back. Melinda replied that Troy had gone up north to work and would be gone for at least three months. She said she missed him already and was worried that he might miss the birth, because the camp where he worked was very remote. Because only a few flights a week were available, Melinda was not sure he would be able to leave when she went into labour. The nurse asked Melinda about other family members who might be able to support her. Melinda said she is estranged from her mother, but her 19-year-old sister might be able to be with her for the birth, if she can take time off work. The nurse suggested that Melinda consider arranging to have a doula present during labour to offer physical, emotional, and informational support. The doula would meet with Melinda sometime before her due date to talk with her about what would be most helpful to her during labour and would be at her side through the birth. The nurse provided several names of doulas and encouraged Melinda to consider this as an additional support person in case her boyfriend or sister could not make it in time. During the next class, Melinda said that she had contacted a doula and made arrangements to meet with her. She stated that she was relieved to know that she would have labour support if Troy could not attend the birth. She was very appreciative of the nurse's help. Several months later, Melinda phoned the nurse to say that Troy caught a flight in time and that both he and the doula had really helped her during the birth and they were thrilled to have given birth to a healthy baby boy.

include maladaptive coping strategies and ineffective bonding interactions between mother and newborn.

Psychosocial Changes. Like the physiological changes of pregnancy, psychosocial changes may occur at various times during pregnancy and in the puerperium. Table 23-2 summarizes the major categories of psychosocial changes and implications for nursing intervention.

Acute Care. The young adult years are generally a time of good physical and emotional health. Potential health hazards may be related to lifestyle. Acute care for young adults is frequently related to accidents, substance abuse, exposure to environmental and occupational hazards, stress-related illnesses, respiratory infections, gastroenteritis, influenza, urinary tract infections, and minor surgery.

An acute, minor illness can cause a disruption in the life activities of the young adult and increase stress in an already hectic lifestyle. Dependency and limitations posed by treatment regimens can also increase frustration for the young adult. To give young adults control of their health care choices, it is important for you to keep them informed about their health status and involve them in health care decisions. Acute phases of chronic illnesses may pose challenges for young adults.

Restorative and Continuing Care. Chronic conditions in young adulthood, although not common, do occur.

► TABLE 23-1

Major Physiological Changes During Pregnancy

Signs and Symptoms

Causes

First Trimester

Amenorrhea	Fertilization and implantation of egg
"Morning sickness" (nausea, sometimes vomiting)	Increases in hormone levels
Breast changes: enlargement, tenderness, darkened and enlarged nipples	Increased serum hormone levels
Urinary frequency	Increased estrogen levels
Fatigue	Pressure of uterus on bladder
	Increased nutritional demands
	Decreased nutritional intake resulting from morning sickness

Second Trimester

Integumentary changes: pigment changes in nipple and breast, hyperpigmentation of abdominal line (linea nigra), mottling of cheeks or forehead (chloasma, or "mask of pregnancy"), localized or generalized pruritis	Increased levels of melanocyte-stimulating hormone
Hypertrophy of gums, causing gingival swelling and bleeding	Proliferation of interdental papillary blood vessels, caused by increased estrogen levels
Increasing height of uterine fundus	Growth of fetus
Sensation of movement or of abdominal gas (quickening)	Fetal movement

Third Trimester

Braxton-Hicks contractions	Expansion and preparation of uterus for labour
Increased colostrum	Hormonal influence; preparation of breasts for lactation
Increased urinary frequency	Pressure on bladder from enlarged fetus
Shortness of breath	Pressure on diaphragm from enlarged uterus
Supine hypertension	Uterine pressure on inferior vena cava
Heartburn	Slower gastric emptying and esophageal reflux

Data from Lowdermilk, D., Perry, S., & Cashion, M. C. (2011). *Maternity nursing* (8th ed.). St Louis, MO: Mosby.

Chronic illnesses such as hypertension, coronary artery disease, and diabetes may have their onset in young adulthood without being known to the young adult until later in life. Causes of chronic illness and disability in a young adult can include accidents, multiple sclerosis, rheumatoid arthritis, HIV, and cancer. Chronic illness and disability can affect the accomplishment of important developmental tasks in young adulthood.

► TABLE 23-2

Major Psychosocial Changes During Pregnancy

Type of Change	Implications for Nursing Intervention
Body image	Morning sickness and fatigue may contribute to poor body image. Increase in breast size may make the woman feel more feminine and sexually appealing but may also be uncomfortable. The woman begins to “show” during the second trimester. The woman may experience a general feeling of well-being; she can feel the baby move and hear the baby’s heartbeat.
Role changes	Both partners think about impending role changes and can have feelings of uncertainty about them. Both partners may have feelings of ambivalence about becoming parents and concern about ability to be parents.
Sexuality	Partners need reassurance that sexual activity will not harm the fetus. Desire for sexual activity may be influenced by body image. Partners may desire cuddling and holding rather than sexual intercourse.
Coping mechanisms	Partners need reassurance that childbirth and child-rearing are natural and positive experiences but can also be stressful. Partners should be provided guidance in preparation for childbirth and encouraged to participate in childbirth classes.
Stresses during puerperium	Partners may return home from hospital fatigued and unfamiliar with infant care. Partners may experience physical discomfort or feelings of anxiety. The woman may have to return to work soon after delivery, with subsequent feelings of guilt, anxiety, or, possibly, sense of freedom or relief.
Postpartum blues and depression	Postpartum blues symptoms include transient emotional or mood disturbances such as weepiness, insomnia, anxiety, and poor concentration about 3 to 6 days after birth. Postpartum depression symptoms include extreme anxiety, sense of failure, feelings of guilt, sleep disturbances, appetite disorders, excessive concerns about the baby, and suicide ideation. Interventions include medication, therapy, counselling, and support.

They can reduce a young adult’s independence and require the person to change personal, family, and career goals. A young adult with chronic illness or disability may experience developmental problems related to sense of identity. The person needs support in the establishment of independence, reorganization of intimate relationships and family structure, and launching of a chosen career (Lewis et al., 2010).

Middle Adulthood

The middle adult years begin around the early to mid-30s and last through the mid-60s. Personal and career achievements have often already been experienced. Many middle-aged adults enjoy assisting their children and other young people to become productive and responsible adults. Middle-aged adults may also begin to help aging parents. Technology has an increasing impact on work, pleasure, and play for middle-aged adults. Using leisure time in satisfying and creative ways is a challenge that, if met satisfactorily, enables middle-aged adults to prepare for retirement. Socioeconomic instability brought on by corporate restructuring and economic realities may leave many middle-aged adults either jobless or forced to accept lower-paying jobs.

Men and women must adjust to inevitable biological changes. Middle-aged adults adapt self-concept and body image to physiological realities and changes in physical appearance. Exercising, eating well, getting enough sleep, and practising good hygiene promote good health and a positive attitude toward physiological changes.

Physical Changes

Major physiological changes occur between the ages of 40 and 65 years. Table 23-3 summarizes normal developmental changes that you consider when conducting a physical examination. The most visible changes are greying of the hair, wrinkling of the skin, and thickening of the waist. Decreases in hearing and visual acuity are often noted during this period. These physiological changes may affect the person’s self-concept and body image. For women, the most significant physiological change during middle age is menopause. Men may also notice several sexual changes as androgen levels decrease, such as less firm erections and less frequent ejaculation (see Chapter 26). However, many middle-aged men are still capable of producing fertile sperm and fathering a child.

Perimenopause and Menopause. Menstruation and ovulation occur in a cyclical rhythm in women from adolescence into middle adulthood. **Perimenopause** is the period during which ovarian function declines, which results in a diminishing number of ova and irregular menstrual cycles. During this perimenopause time, however, women can still become pregnant. **Menopause** is the permanent cessation of menstruation. It occurs primarily because the ovaries stop producing the hormones estrogen and progesterone. Menopause typically occurs between the ages of 45 and 60 years. The presence and experience of menopausal symptoms, such as hot flashes and insomnia, varies among women from being asymptomatic to being severe enough to interfere with activities of daily living (Condon, 2004).

Cognitive Changes

Changes in the cognitive function of middle-aged adults are rare except with illness or trauma. The middle-aged adult can learn new skills and information. Some middle-aged adults enter educational or vocational programs to prepare themselves for entering the job market or changing jobs.

Psychosocial Changes

The psychosocial changes in middle-aged adults may involve expected events, such as children moving away from home, or unexpected events, such as a marital separation or the death of a loved one. Many middle-aged adults may find themselves

► TABLE 23-3

**Physical Assessment Findings
in the Middle-Aged Adult**

Body System	Expected Findings
Integument	Intact condition Appropriate distribution of pigmentation Slow, progressive decrease in skin turgor Greying and loss of hair (baldness patterns in men are established by age 55; hair loss after this time might have other causes)
Head and neck	Symmetry of scalp, skull, and face
Eyes	Normal accessory organs of vision Visual acuity (according to Snellen chart) that is less than 20/50 Normal pupillary reaction to light and accommodation Normal visual fields and extraocular movements Normal retinal structures
Ears	Normal auditory structures and acuity
Nose, sinuses, and throat	Patent nares and intact sinuses, mouth, and pharynx Location of trachea at midline Nonpalpable lateral thyroid lobes
Thorax and lungs	Increased anteroposterior diameter Respiratory rate: 12–20 breaths per minute and regular Ratio of respiratory rate to heart rate: 1:4 Normal tactile fremitus, resonance, and breath sounds
Heart and vascular system	Normal heart sounds Systole: first heart sound loudest at apex Diastole: first heart sound loudest at base Point of maximal impulse: at fifth intercostal space in midclavicular line and 2 cm or less in diameter Temperature: 36.1°C–37.6°C Pulse: 60–100 bpm (in conditioned athlete, 50 bpm) Blood pressure: 130 mm Hg systolic, 85 mm Hg diastolic All pulses palpable
Breasts	Decreased size resulting from decreased muscle mass Normal nipples
Abdomen	No tenderness or organomegaly Decreased strength of abdominal muscles
Female reproductive system	Change in menstrual cycle and in duration and quality of menstrual flow to cessation of menses “Hot flashes”
Male reproductive system	Normal penis and scrotum Prostatic enlargement in some individuals
Musculoskeletal system	Decreased muscle mass Decreased range of joint motion
Neurological system	Appropriate affect, appearance, and behaviour Lucidity and appropriate level of cognitive ability Intact cranial nerves Adequate motor responses Responsive sensory system

in the so-called **sandwich generation**, simultaneously having the responsibilities of raising their own children and caring for aging parents. These changes may result in stress that can affect middle-aged adults' overall health. During middle age, the person examines life goals and relationships. Often a “midlife crisis” results, in which the person feels turmoil or anxiety about the course of his or her life and desires change. As a result, the person may change relationships, lifestyle, or occupation.

You should assess the major life changes occurring in the middle-aged adult and the impact that the changes have on that person's state of health. Your assessment should also include individual psychosocial factors such as coping mechanisms and sources of social support.

In the middle adult years, as children depart from the household, the family enters the postparental family stage. Time and financial demands on the parents decrease, and the couple faces the task of redefining their relationship. If grandchildren are born, grandparenting styles must be chosen. Many middle-aged adults begin to adopt a healthier lifestyle. Health promotion needs for the middle-aged adult include adequate rest, leisure activities, regular exercise, good nutrition, reduction or cessation in the use of tobacco or alcohol, and regular screening examinations. A middle-aged adult's social environment is also important, including relationship concerns; communication and relationships with children, grandchildren, and aging parents; and caregiver concerns with their own aging or disabled parents.

According to Erikson's (1968, 1982) developmental theory, the primary developmental task of the middle adult years is to achieve generativity (see Chapter 21). *Generativity* is the willingness to care for and guide others. Middle-aged adults can achieve generativity with their own children or other younger people. If middle-aged adults fail to achieve generativity, stagnation occurs. This state is manifested by excessive concern with themselves or destructive behaviour toward their children and the community.

Career Transition. Career changes may occur by choice or as a result of changes in the workplace or society. Middle-aged adults change occupations for a variety of reasons, including limited upward mobility, decreasing availability of jobs, and seeking a more challenging occupation. In some cases, technological advances or other changes force middle-aged adults to seek new jobs. Some middle-aged adults choose not to retire and continue to work as long as they are able to work. Such changes, particularly when unanticipated, may result in stress that can affect health, family relationships, self-concept, and other dimensions. Assessing levels of coping and adaptation to work-related stress and changes is an essential part of your role.

Sexuality. After the departure of their last child from the home, many couples rejuvenate their relationships and find increased marital and sexual satisfaction during middle age. Onset of menopause can affect the sexual health of the middle-aged woman. A woman may desire increased sexual activity because pregnancy is no longer possible. Menopausal women may also experience vaginal dryness and dyspareunia or pain during sexual intercourse (see Chapter 26). During middle age, a man may notice changes in the strength of his erection and a decrease in his ability to experience repeated orgasm. This may result in the use of erectile function-enhancing agents (e.g., sildenafil citrate, tadalafil). Other factors influencing sexuality during this period include work stress, diminished health of

one or both partners, and the use of prescription medications with side effects that may influence sexual desire or functioning (e.g., antihypertensive agents). Both partners may experience stresses related to sexual changes or a conflict between their sexual needs and self-perceptions and social attitudes or expectations. Assessing sexual functioning contributes to identification of potential risks for sexually transmitted infections and adverse health outcomes that can result from erectile function enhancing agents.

Family Types. Psychosocial factors involving the family may include the stresses of singlehood, marital changes, family transition as children leave home, and the care of aging parents.

Singlehood. Many adults older than 35 years have never been married. Many of them have chosen to delay marriage and parenthood. Some single middle-aged adults, however, have chosen to become parents, either biologically or through adoption. Many single middle-aged adults may have no relatives but share a family type of relationship with close friends or work associates. Consequently, some single middle-aged adults may feel isolated during traditional “family” holidays. In times of illness, single adults may have to rely on relatives or friends. Your assessment of single middle-aged adults should include a thorough assessment of psychosocial factors, including the individual’s definition of family and available support systems.

Marital Changes. Marital changes that may occur during middle age include death of a spouse, separation, divorce, and the choice of remarriage or remaining single. If a single, middle-aged adult decides to marry, the stressors of marriage are similar to those for the young adult. A widowed, separated, or divorced patient goes through a period of grief and loss in which it is necessary to adapt to the change in marital status. Normal grieving progresses through a series of phases, and the resolution of grief may take a year or more. You should assess middle-aged adults’ coping with the grief and loss associated with life’s changes (see Chapter 28).

Family Transitions. Departure of the last child from the home may be a stressor. Many parents welcome freedom from child-rearing responsibilities, whereas others feel lonely or without direction because of this change (known as “empty-nest” syndrome). Eventually parents must reassess their marriage, resolve conflicts, and plan for the future. On occasion, this readjustment phase may lead to marital conflicts, separation, and divorce.

Care of Aging Parents. Increasing lifespans have led to increased numbers of older adults in the population. Therefore, greater numbers of middle-aged adults must address the personal and social issues confronting their aging parents, including becoming caregivers for their older parents.

Traditional social expectations between generations in families have changed because of housing, employment, health, and economic realities. Conflicts may arise between middle-aged adults and their older adult parents, who may strive to remain independent. Negotiations and compromises help in defining and resolving problems. You may encounter middle and older adults in the community, in long-term care facilities, and in hospitals. You can help identify the health needs of both groups and can assist the multigenerational family in determining the health and community resources available to them as they make decisions and plans. You should also assess family relationships to determine family members’ perceptions of responsibility and loyalty in relation to caring for older adult members. It is also important to assess environmental

resources (e.g., number of rooms in the house, stair rails, or handrails in bathrooms) needed for adults to care for their older parents.

Health Concerns

Physiological concerns for middle-aged adults include stress, level of wellness, obesity, and the formation of positive health habits. When adults seek health care, your focus on the goal of wellness can guide patients to evaluate health behaviours, lifestyle, and environment. Patients’ health can be undermined by alterable factors such as stress, obesity, tobacco use, excessive alcohol consumption, poor nutrition, and unsafe sexual practices. Drug use, abuse, and misuse may also occur. Attention to these risk factors can increase the quality of life and add years to it.

Stress and Stress Reduction. Middle-aged adults’ perceptions of health and health behaviours are often important factors in maintaining health. Individuals are prone to stress-related illnesses such as heart attacks, hypertension, migraine headaches, ulcers, colitis, autoimmune disease, backache, arthritis, and cancer. Stress levels may also increase as the middle-aged adult tries to balance responsibilities related to employment, family life, care of children, and care of aging parents.

Throughout life, people are exposed to many stressors (see Chapter 29). After these stressors are identified, you and the patient can work together to intervene and modify the stress response. Stress can be reduced in three ways. First, the frequency of stress-producing situations can be minimized. Together, you and the patient identify approaches to prevent stressful situations, such as habituation, change avoidance, time blocking, time management, and environmental modification. Second, stress resistance can be increased by psychophysiological preparation, such as increasing self-esteem, improving assertiveness, redirecting goal alternatives, and reorienting cognitive appraisal. Third, the physiological response to stress can be avoided. You can teach the patient relaxation techniques, imagery, and biofeedback to recondition the patient’s response to stress. Chapter 34 explains these general interventions in greater detail.

Levels of Wellness. You must be able to assess the health status of the middle-aged patient. Such assessment offers direction for planning nursing care and is useful in evaluating the effectiveness of nursing interventions. You can consult Table 23-3, which shows the expected physical assessment findings of the middle-aged adult, and use standard assessment techniques as guides for physical assessment (see Chapter 31).

Obesity. Obesity, defined as having a body mass index of 30 or more, is a health concern for many middle-aged adults. Obesity peaks in middle age. Among Canadian adults, 24% are obese and an additional 36% are overweight (Statistics Canada, 2012a; Tjepkema, 2008). Health consequences of obesity include such conditions as high blood pressure, high blood cholesterol levels, type 2 (non-insulin-dependent) diabetes mellitus, coronary heart disease, osteoarthritis, and obstructive sleep apnea. Continued focus on the goal of wellness can assist patients in evaluating health behaviours and lifestyle that contribute to obesity during the middle adult years. Counselling related to physical activity and nutrition is an important component of the plan of care for overweight and obese patients.

Forming Positive Health Habits. A habit is a person’s usual practice or manner of behaviour. This behaviour pattern

* BOX 23-5 PATIENT TEACHING

Encouraging Positive Health Habits

Objective

- Patient will increase exercise patterns to include three 2 km walks per week to assist in weight loss and to improve cardiopulmonary functions.



Teaching Strategies

- Review with patient the daily work schedule and identify potential times for exercise.
- Inform patient about the effect of exercise on weight control and improved cardiac function.
- Demonstrate how to calculate target heart rate and assess pulse correctly.
- Provide warm-up and cool-down exercises, and demonstrate how to do them.
- Instruct patient about the importance of support shoes for walking exercises.

Evaluation

- Have patient keep log of exercise periods.
- Have patient demonstrate pulse measurement.
- Have patient demonstrate warm-up and cool-down exercises.
- Inspect patient's feet for blisters or sores.

is reinforced by frequent repetition until it becomes the individual's customary way of behaving. Some habits support health, such as exercise, eating a balanced diet, participating in routine screening and diagnostic tests (e.g., laboratory work for cholesterol, mammography), reducing stress, and daily brushing and flossing of teeth. Other habits involve behaviours harmful to health, such as smoking, consuming excessive alcohol, using illegal drugs, or eating foods with little or no nutritional value.

During assessment, you frequently obtain data about patients' positive and negative health behaviours. In the planning, implementation, and evaluation phases, you help the patient maintain habits that protect health and offer healthier alternatives to poor habits.

Health teaching and health counselling are often directed at improving health habits (Box 23-5). The more fully you understand the dynamics of behaviour and habits, the more likely your interventions are to help the patient to achieve or reinforce health-promoting behaviours.

You can coach patients about forming positive health habits. By providing information about how the body functions and how habits are formed and changed, you raise patients' understanding of the impact of behaviour on health. You cannot change patients' habits. Patients have control of and are responsible for their own behaviours. You can explain psychological principles of changing habits and offer information about health risks. Ultimately, however, the patient decides which behaviours will become habits of daily living. Barriers to change exist (Box 23-6). Unless these barriers are minimized or eliminated, it is futile to encourage the patient to take actions that are going to be blocked.

As with adolescents and young adults, you continue educating middle-aged adults about STIs, substance abuse, and accident prevention.

► BOX 23-6

Barriers to Changing Negative Health Habits

External Barriers

- Lack of facilities
- Lack of materials
- Lack of social supports

Internal Barriers

- Lack of knowledge
- Lack of motivation
- Insufficient skills to effect change in health habits
- Undefined short- and long-term goals

Anxiety. Anxiety is a common response to change, conflict, and perceived control of the environment (Austin & Boyd, 2010). Adults often experience anxiety in response to the physiological and psychosocial changes of middle age. Such anxiety can motivate the adult to rethink life goals and can stimulate productivity. For some adults, however, this anxiety precipitates psychosomatic illness and preoccupation with death. Such middle-aged adults view life as being half or more over and think in terms of the time left to live.

Clearly, a life-threatening illness, marital transition, or job stressor increases the anxiety of the patient and family. You may need to use crisis intervention or stress management techniques to help the patient adapt to the changes of the middle adult years (see Chapter 29).

Depression. Depression is a mood disorder that manifests itself in many ways. Although its onset occurs most frequently between the ages of 25 and 44 years, it is common among adults in the middle years and may have many causes (Austin & Boyd, 2010). The risk factors for depression include being female; disappointments or losses at work, at school, or in family relationships; departure of the last child from the home; and family history. The incidence of depression in women is twice that in men.

People experiencing mild depression describe feeling sad, "blue," downcast, "down in the dumps," and tearful. Other symptoms include changes in the amount (not sleeping [insomnia], sleeping too much [hypersomnia]), or quality of sleep (multiple awakenings), irritability, feelings of social disinterest, and decreased alertness. Physical changes such as weight loss or weight gain, headaches, or feelings of fatigue regardless of the amount of rest may also be depressive symptoms. Depression that occurs during the middle years is commonly characterized by moderate to high anxiety and physical complaints. Mood changes and depression are common phenomena during menopause. Depression may be worsened by the abuse of alcohol or other substances. Your assessment of a depressed middle-aged adult includes focused data collection regarding individual and family history of depression, mood changes, cognitive changes, behavioural and social changes, and physical changes. Assessment data should be collected from both the patient and his or her family. Family data may be particularly important, depending on the level of depression being experienced by the middle-aged adult.

Primary Health Care Programs. Primary health care programs for young and middle-aged adults are designed to prevent illness, promote health, and detect disease in the early stages. You can make valuable contributions to the community's health by taking an active part in the planning of screening programs, teaching programs, and support groups for young and middle-aged adults.

* BOX 23-7 CULTURAL ASPECTS OF CARE

All women experience menopause, but the experience itself of menopause is unique for every woman. The culture in which women participate, beginning in early childhood, contributes to how women learn to respond. The experience of menopause for Korean women in Canada has been studied. Elliott et al.'s (2002) findings revealed that although menopause symptoms required management, Korean women considered menopause to be a natural process. They used herbs and maintained healthy diets, as well as used Western medicine, to deal with menopause symptoms.



Implications for Practice

- Be aware of cultural influences that may affect the experience of menopause, and how women seek assistance from health care providers.
- Educational materials that combine Western remedies with traditional approaches may be more easily accepted and utilized.
- Cultural norms and taboos may influence women's willingness to discuss personal issues such as menopause. Information sessions on the topic, or more broadly related to women and aging, should be held in community settings where women might gather and feel comfortable.

Source: Elliott, J., Berman, H., & Kim, S. (2002). A critical ethnography of Korean Canadian women's menopause experience. *Health Care for Women International*, 23(4), 377–388.

Family planning, birthing, and parenting skills are program topics in which adults might be interested. Health screening for diabetes, hypertension, eye disease, and cancer is a good opportunity for you to perform assessment and provide health teaching and health counselling.

Health education programs can promote changes in behaviour and lifestyle. As a health teacher, you offer information that enables the patient to make decisions about health practices. You must be sure that educational programs are culturally appropriate (Box 23-7). Encouraging young to middle adults to adopt more positive health practices during young and middle adulthood may lead to fewer or less complicated health problems during older adulthood. During health counselling, the patient and you should design a plan of action that addresses the patient's health and well-being. Through objective problem solving, you help the patient grow and change.

Acute Care. Acute illnesses and conditions experienced in middle adulthood may be similar to those in young adulthood. Injuries and acute illnesses in middle adulthood, however, may take a longer recovery period because of the slowing of recuperative processes. In addition, acute illnesses and injuries experienced in middle adulthood are more likely to become chronic conditions. The incidence of HIV disease occurs across all age groups and is a consideration for middle-aged adults, as well. Although typically thought of as occurring in earlier age groups, middle-aged adults should be assessed for risk factors and given information to help prevent HIV transmission.

Restorative and Continuing Care. Chronic illnesses such as diabetes mellitus, hypertension, rheumatoid arthritis, chronic obstructive pulmonary disease, or multiple sclerosis may affect the roles and responsibilities assumed by the middle-aged adult. Strained family relationships, modifications in family activities, increased health care tasks, increased

financial stress, the need for housing adaptation, social isolation, medical concerns, and grieving may all result from chronic illness. The degree of disability and the patient's perception of both the illness and the disability determine the extent to which lifestyle changes will occur. A few examples of the problems experienced by patients who develop debilitating chronic illness during adulthood include role reversal, changes in sexual behaviour, and altered self-image. Your assessment of the chronically ill middle-aged adult includes assessment of his or her emotional, physical, social, and spiritual health status and the knowledge base of both the patient and family. This assessment should include the medical course of the illness and the prognosis for the patient. In addition, you determine the coping mechanisms of the patient and family, their adherence to treatment and rehabilitation regimens, and the need for community and social services, along with appropriate referrals.

✦ KEY CONCEPTS

- Adult development involves orderly and sequential changes that adults experience over time.
- Young adults are generally in a stable period of physical development, except for pregnancy-related changes.
- Cognitive development continues throughout the young and middle adult years.
- Emotional health of young adults is correlated with their ability to address and resolve personal and social problems.
- Young adults must choose a career and decide whether to remain single or marry and begin a family.
- Pregnant women need to understand physiological changes occurring during each trimester.
- Psychosocial changes and health concerns during pregnancy and the puerperium period affect the mother and the rest of the family.
- Health promotion interventions are important during the prenatal period and can improve the well-being of the woman and fetus.
- Midlife transition begins when a person becomes aware that physiological and psychosocial changes signify passage to another stage in life.
- Two significant physiological changes of the middle years are menopause in women and changes in sexual response in men.
- Cognitive changes are rare in middle age except in cases of illness or physical trauma.
- Psychosocial changes for middle-aged adults may be related to career transition, sexuality, marital changes, family transition, and care of aging parents.
- Health goals of middle-aged adults commonly involve preventing stress-related illnesses, participating in health assessments, and adopting positive health habits.

✦ CRITICAL THINKING EXERCISES

1. Katya is a 24-year-old woman who smokes two packs of cigarettes per day. She began smoking when she was 14 years old. Katya complains to you at the clinic, "I just can't seem to kick the habit no matter how hard I try." What information do you need to know to assist Katya in quitting smoking?
2. Rohan, 48 years old, married, and the father of 13- and 16-year-old sons, has recently had to assume the responsibility of caring for his 78-year-old mother after she suffered a stroke. Describe your role in assisting Rohan to care for his mother.

❖ REVIEW QUESTIONS

1. Most young adults have completed physical growth by the age of
 1. 18 years
 2. 20 years
 3. 25 years
 4. 30 years
2. Young adults usually have good health. However, it is important to direct health care education in this population toward activities related to
 1. Health promotion
 2. Primary prevention
 3. Secondary prevention
 4. Tertiary prevention
3. When determining what amount of information the individual needs to make decisions about the prescribed course of therapy, you should consider factors that may affect the individual's compliance with the regimen, including educational level, socioeconomic factors, and
 1. Sexuality
 2. Lifestyle
 3. Gender
 4. Motivation and desire to learn
4. A common physiological change in the second trimester of pregnancy is
 1. Morning sickness
 2. Amenorrhea
 3. Increased colostrum
 4. Quickening
5. The most common cause of death in young adults is
 1. Suicide
 2. Accidents
 3. Substance use
 4. Cancer
6. Close friends and associates of the single young adult may also be viewed as the individual's
 1. Siblings
 2. Family
 3. Alternative family structure
 4. Substitute parents
7. A young man's father and paternal grandfather had myocardial infarctions (heart attacks) in their 50s. Therefore, he is at risk for a future myocardial infarction. The young man faces what type of health risk?
 1. Lifestyle
 2. Poor personal hygiene
 3. Family history
 4. Hereditary disease

8. In the middle adult years, the family enters which stage?
 1. Generative stage
 2. Independence stage
 3. Postparental family stage
 4. Family orientation stage
9. To improve an adult's health habits, you often use health counseling and
 1. Medications
 2. Referrals
 3. Health teaching
 4. Stress management techniques
10. To help recondition the patient's response to stress, you can use biofeedback, imagery, and
 1. Medication
 2. Time management strategies
 3. Relaxation techniques
 4. Assertiveness training

❖ RECOMMENDED WEB SITES

Breastfeeding Committee for Canada: <http://www.breastfeedingcanada.ca>

The Breastfeeding Committee for Canada was established in 1991 as a Health Canada initiative. This site addresses Canadian breastfeeding issues.

Canadian AIDS Treatment Information Exchange: <http://www.catie.ca/>

This site provides information about the treatment, management, and prevention of HIV and Hepatitis C.

Canadian Cancer Society: <http://www.cancer.ca>

This site provides information on specific cancers, clinical trials, support services, and ways to get involved.

Canadian Women's Health Network: <http://www.cwhn.ca>

The goal of the Canadian Women's Health Network is to share information, resources, and strategies to improve women's health.

Public Health Agency of Canada: <http://www.phac-aspc.gc.ca/index-eng.php>

This site has links to topics concerning health issues of Canadians, including information on chronic diseases, infectious diseases, and healthy living.

La Leche League Canada: <http://www.lllc.ca>

This site encourages, promotes, and provides mother-to-mother breastfeeding support and educational opportunities as an important contribution to the health of children, families, and society.

Review Question Answers

1. 2; 2. 1; 3. 4; 4. 4; 5. 2; 6. 2; 7. 3; 8. 3; 9. 3; 10. 3

Rationales for the Review Questions appear at the end of the book.

Older Adulthood

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objectives

Mastery of content in this chapter will enable you to:

- Define the key terms listed.
- Discuss demographic trends related to older adults in Canada.
- Identify common myths and stereotypes about older adults.
- List the types of community-based and institutional health care services available to older adults.
- Describe the concepts of aging well and quality of life.
- Discuss common developmental tasks of older adults.
- Describe common physiological changes associated with aging.
- Differentiate among delirium, dementia, and depression.
- Discuss issues related to psychosocial changes connected with aging.
- Describe selected health concerns of older adults.
- Identify nursing interventions related to the physiological, cognitive, and psychosocial changes of aging.

key terms

Abuse, p. 385
 Ageism, p. 386
 Aging well, p. 377
 Alzheimer's disease, p. 383
 Cognitive stimulation, p. 392
 Delirium, p. 382
 Dementia, p. 383
 Depression, p. 384
 Geriatrics, p. 375

Gerontic nursing, p. 375
 Gerontological nursing, p. 375
 Gerontology, p. 375
 Nonstochastic theories, p. 376
 Personal care home, p. 378
 Polypharmacy, p. 390
 Reminiscence, p. 392
 Stochastic theories, p. 376

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The identification of 65 years of age as the start of older adulthood dates back to social reform in Germany in the nineteenth century. The age of 65 years continues to be used as the lower boundary to define older adulthood in demographics and social policy, although many older adults consider themselves to be “middle-aged” well into their 70s (Special Senate Committee on Aging, 2009). In Canada, the Special Senate Committee on Aging (2009) suggests that the term *older person* is the most appropriate term for adults over the age of 65 years. Chronological age may have little relation to the reality of aging for an older adult. Each person ages in his or her own ways according to his or her own schedules and life histories. Even though generalizations are made in this chapter about the aging process and its effect on individuals, every older adult is unique and must be treated as a unique individual by nurses.

The number of older adults in Canada is growing, both absolutely and as a proportion of the total population. Seniors make up the fastest-growing age group in Canada (Human Resources and Skills Development Canada, 2011). In 2011, 5 million adults were older than 65 years in Canada; they represented 14.8% of the population (Statistics Canada, 2012). This number represented an increase of 14.1% since 2006. Geographic variations in the aging population exist across Canada; the proportion of older adults is lowest in Alberta (11.1%) and highest in the four Atlantic provinces (16%) (Statistics Canada, 2012). The number of older adults is expected to increase to

9.8 million (24.5% of the population) by 2036 (Statistics Canada, 2008). Part of that increase is a result of the extension of the average lifespan. In 2005, the average life expectancy at birth for Canadians was 80.4, compared to 70.9 in 1991 (Statistics Canada, 2008). On average, girls born in 2005 can expect to live 4.7 years longer than boys, with a female life expectancy at 82.7 years and male life expectancy at 78 years. Two other factors contribute to the projected increase in the number of older adults: the aging of the baby-boom generation and the growth of the population segment older than 85 years. The baby boomers are the large cohort of adults born between 1946 and 1964. In 2011, the oldest baby boomers reached the age of 65 years and represented the fastest growing age group in Canada. By 2031, all baby boomers will reach the age of 65 and the proportion of seniors in Canada will reach 23%. As baby boomers age, social and health care programs will need to expand to meet their needs, as well as the needs of the second fastest-growing group of adults, those aged 100 years and older (Statistics Canada, 2012). The numbers of centenarians had increased 25.7% since 2006 with a census count of 5826 people in 2011.

The diversity of the population older than 65 years is also projected to increase. Approximately 26.2% of Canadian older adults were born outside of Canada. Most immigrated when young. Between 1995 and 2004, 2% to 4% of immigrants arriving each year were older adults, a number expected to increase as immigration patterns change. Of all immigrant older adults, 96% can speak one or both of Canada's official languages. Of the population older than 65 years, more women than men are unable to speak French or English. In 2001, 5.0% of older women and 3.2% of older men were unable to speak either official language. Currently, older adults make up a small proportion (4%) of Canada's Aboriginal population (Statistics Canada, 2008). However, the number of older Aboriginal people is expected to triple by 2016 as their population ages and lives longer. Caring for older adults from these groups, nurses must account for diversity in cultures, values, and languages. Examples of culturally safe nursing approaches to older adults are respect for preferences in food, music, and religion; attentive listening; use of physical assessment norms appropriate for diverse groups; and asking about personal health practices, family customs, lifestyle preferences, and spiritual resources (Touhy et al., 2012). Chapter 9 provides further information on culturally safe care.

Variability Among Older Adults

The nursing care of older adults poses special challenges because of great variation in their physiological, cognitive, and psychosocial health. Levels of functional ability also vary widely among older adults. The majority of older adults are active and involved members of their communities. A smaller number have lost the ability to care for themselves, are confused or withdrawn, are unable to make decisions concerning their needs, or have a combination of these factors. Most older adults (93%) live in private homes, with only 7% residing in institutions such as nursing homes (Statistics Canada, 2008). Age influences living arrangements: the proportion of older adults living with a spouse decreases with age, the proportion living alone increases with age, and the proportion living in an institution increases with age.

Aging does not inevitably lead to disability and dependence. Most older people remain functionally independent

despite the increasing prevalence of chronic disease. Nursing assessment, a complex and challenging process, can provide valuable clues to the effect a disease or illness is having on a patient's functional status. Chronic conditions add to the complexity of assessment and care of the older adult. Approximately 91% of older adults report one or more chronic conditions; arthritis, hypertension, heart disease, vision impairment, and diabetes mellitus are the most common conditions in non-institutionalized older adults (Statistics Canada, 2008). These chronic conditions impose limitations on activities: slightly more than 22% of adults 65 to 74 years of age and nearly 50% 85 years or older report some limitations in activities.

The physical, cognitive, and psychosocial aspects of aging are closely related. For the older adult, a reduced ability to respond to stress, the experience of multiple losses, and the physical changes associated with normal aging may combine to increase the risk for illness and functional deterioration. Although the interaction of these physical and psychosocial factors can be serious, you should not assume that all older adults have signs, symptoms, or behaviours representing disease and decline or that these are the only items to be assessed. An older adult's strengths and abilities must also be identified during the assessment.

Terminology

As the number of older adults increases, the specialty of gerontological nursing is gaining in importance. Several terms are used, at times interchangeably, to describe this specialty (Meiner & Leuckenotte, 2006):

- **Geriatrics** is the branch of medicine that deals with physiological and psychological aspects of aging and with diagnosis and treatment of diseases affecting older adults.
- **Gerontology** is the study of all aspects of the aging process and its consequences.
- **Gerontological nursing** is concerned with assessment of the health and functional status of older adults; diagnosis, planning, and implementing health care and services to meet the identified needs; and evaluating the effectiveness of such care. This is the term most often used by nurses specializing in this field.
- **Gerontic nursing**, a seldom-used term that is gaining popularity, is the art and practice of nurturing, caring for, and comforting older patients, rather than merely the treatment of disease.

Myths and Stereotypes

Despite ongoing research in the field of gerontology, false beliefs and myths about older adults persist. These stereotypes include beliefs about the physical and psychosocial characteristics and the lifestyles of older adults. However, negative stereotypes may adversely affect access to and the quality of the care provided to older patients (Kagan, 2008). Nurses, although personally susceptible to the myths and stereotypes held by society, have the responsibility to dispel the myths and replace the stereotypes with accurate information.

Older adults are sometimes stereotyped as ill and disabled. However, although many experience chronic conditions or have at least one disability that limits performance of activities of daily living (ADLs), only 23% of older adults describe their health as poor or fair (Statistics Canada, 2008). Other common misconceptions are that older adults are generally not

interested in sex and that any interest in sexual activities is abnormal and should be discouraged. However, many older adults report continued enjoyment of sexual relationships.

Some people believe that older adults are forgetful, confused, rigid, bored, unfriendly, and unable to understand and learn new information. However, centenarians, the oldest of the old, are described as having an optimistic outlook on life, good memories, broad social contacts and interests, and tolerance for others (Touhy et al., 2012). Although the process of learning may be affected by age-related changes in vision or hearing or by reduced energy and endurance, older adults are lifelong learners. You should use teaching techniques that compensate for sensory changes, provide additional time for remembering and responding, and present concrete rather than abstract material to facilitate learning by older adults. Other effective teaching techniques draw from older adults' past experiences and correspond to their identified interests rather than to the content areas believed important by the health care provider. Box 24-1 presents additional teaching strategies that you can use to address the learning needs of older adults.

In a society that values attractiveness, energy, and youth, these myths and stereotypes lead to the undervaluing of older adults. Some people believe that older adults are unattractive and become worthless to society after they leave the

* BOX 24-1 FOCUS ON OLDER ADULTS

Older Adult Learning Needs Teaching Strategies

- Make sure the patient is ready to learn before you try to teach him or her. Watch for clues that would indicate that the patient is preoccupied or too anxious to comprehend the material.
- Sit facing the patient so that he or she can watch your lip movements and facial expressions.
- Speak slowly.
- Keep your tone of voice low; older adults can hear low-frequency sounds better than high-frequency sounds.
- Give the patient enough time to respond because older adults' reaction times may be longer than those of younger people.
- To help the patient concentrate, focus on a single topic.
- Keep environmental distractions to a minimum.
- With permission of the patient, invite another member of the household to join the discussion.
- Use auditory, visual, and tactile cues to enhance learning and help the patient remember information.
- Ask for feedback to ensure that the information has been understood.
- Refer to the patient's past experience; connect new learning to that already learned.
- Compensate for physical discomfort and sensory alterations if necessary.
- Support a positive self-image in the learner.
- Use creative teaching strategies.
- Respond to identified interests of learners.
- Emphasize and integrate emotional and personal values in the acquisition of skills and ideas.



Adapted from Ebersole, P., & Hess, P. (2008). *Geriatric nursing and healthy aging* (p. 552). St Louis, MO: Mosby; and SPRY Foundation. (2001). *Senior citizens can learn quite well, thank you*. Retrieved from <http://www.rwjf.org/pr/product.jsp?id=17930>.

workforce. Others consider the knowledge and experience of older adults to be too old-fashioned to have any current value. These notions underlie the concept of **ageism**, which is discrimination against people because of increasing age, just as racism and sexism are discrimination based on skin colour and gender, respectively. Ageism has the potential to undermine the self-confidence of older adults, limit their access to care, and distort caregivers' understanding of the uniqueness of each older adult (Special Senate Committee on Aging, 2009). A society that values the contribution and wisdom of the older adult helps them to maintain decision making and function to their greatest ability. The Canadian Special Senate Committee on Aging (2009) has concluded that ageism in Canada is pervasive and subtle. Immediate action is needed to combat ageism.

Nurses' Attitudes Toward Older Adults

It is important for you to assess your attitudes toward older adults, your own aging, and the aging of your family, friends, and older adults. Your attitudes toward older adults result partly from personal experiences with older adults' education, employment experiences, attitudes of co-workers and employers, and your own age. Cultivation of positive attitudes toward older adults and specialized knowledge about aging and the health care needs of older adults are priorities for nurses.

Positive attitudes are based in part on a realistic portrayal of the characteristics and health care needs of older adults. In the past, negative attitudes about aging have contributed to the persistence of stereotypes of older adults as dependent and less attractive than younger persons. Health care providers, under the influence of these attitudes, often lacked respect for older persons and ignored the opportunity to actively involve them in care decisions and activities. At times, hospitals and long-term care facilities have treated older adults as objects to be acted upon rather than as independent, dignified adults. The time has come for all nurses to recognize and address ageism by questioning prevailing negative attitudes and stereotypes and advocating for older adults in all care settings.

Theories of Aging

Various theorists have attempted to describe the complex biopsychosocial process of aging. Although many theories have been developed, no single universally accepted theory predicts and explains the complexities of the aging process. You must be aware of the scientific attempts to explain the aging process and the concepts included in the theories. Although the theories are in various stages of development and have limitations, you can use them to increase your understanding of the phenomena affecting the health and well-being of older adults.

The biological theories of aging are categorized as either stochastic theories or nonstochastic theories. **Stochastic theories** view aging as the result of random cellular damage over time. The accumulated damage leads to the physical changes characteristic of the aging process. According to the **nonstochastic theories**, genetically programmed physiological mechanisms within the body control the process of aging.

Psychosocial theories of aging attempt to explain changes in behaviour, roles, and relationships that come with aging. As with biological theories of aging, no single psychosocial theory is universally accepted. The psychosocial theories also reflect the values held by the theorist and society at the time the

theory was first articulated. The three classic psychosocial theories of aging are disengagement theory, activity theory, and continuity theory. According to disengagement theory, the oldest psychosocial theory, aging individuals withdraw from customary roles and engage in more introspective, self-focused activities as society disengages from them (Cummings & Henry, 1961). In the activity theory, unlike the disengagement theory, the continuation of activities performed during middle age is considered necessary for successful aging (Lemon et al., 1972). According to continuity theory or developmental theory (Neugarten, 1964), personality remains the same and behaviour becomes more predictable as people age. Personality and behaviour patterns developed during a lifetime determine the degree of engagement and activity in older adulthood. Newer psychosocial theories, such as gerotranscendence theory (Tornstam, 2003), suggest that older adults deal with the aging process by focusing on others and existential issues such as spirituality rather than their own limitations.

Critics suggest, however, that all psychosocial theories either fail in some measure to consider the many factors that affect an individual's response to the aging process or address those factors in a simplistic manner. Biologically, psychosocially, and spiritually, each individual ages in a unique way.

Developmental Tasks for Older Adults

Theories of aging are closely linked to the concept of developmental tasks appropriate for distinct stages of life. Although no two individuals age in the same way, either biologically or psychosocially, frameworks outlining developmentally appropriate tasks for older adults have been developed. Seven developmental tasks of the older adults are listed in Box 24-2.

These developmental tasks are common to many older adults and are associated with varying degrees of change and loss. The more common losses involve health, significant others, a sense of being useful, socialization, income, and independent living. The ways that older adults adjust to the changes of aging are highly individualized. For some, adaptation and adjustment are relatively easy. For others, coping with the changes caused by aging may require the assistance of family, friends, and health care providers. You must be sensitive to the effect of such losses on older adults and their families and be prepared to offer support.

Older adults must also adjust to the physical changes that accompany aging. The extent and timing of these changes vary from individual to individual, but as body systems age, changes occur in appearance and functioning. These changes are not associated with a disease but are normal changes. The presence of disease may alter the timing of the changes or their

impact on daily life. Structural and functional changes associated with aging are described in "Physiological Changes."

Aging Well and Quality of Life

More recently, theories of successful aging and developmental tasks have been integrated into the concept of aging well or active aging (Chapman, 2005). Older adults are considered to be "**aging well**" when they are achieving self-integration of all aspects of growing older. Faced with the changes that come with aging, older adults must find ways to maintain their quality of life. Existential issues and relationships are important aspects of quality of life for older adults (Register & Herman, 2010). However, the definition of quality of life varies from person to person. You must listen to what an older adult considers to be most important, rather than making assumptions about that individual's priorities. Together, you and the older adult may set objectives for maintaining quality of life, whether quality of life is defined as maintenance of social relationships, continuing to live alone, or continuing activities such as driving or gardening or dancing (Figure 24-1).

Community-Based and Institutional Health Care Services

You may encounter older adults in a wide variety of community-based and institutional health care settings. Outside of the acute care hospital setting, you and other nurses may care for older adults in private homes and apartments, adult day care centres, assisted-living facilities (also known as *supportive housing*), long-term care facilities, and hospices.



Figure 24-1 Older adults engage in many activities that help them to maintain their quality of life.

► BOX 24-2

Developmental Tasks for Older Adults

- Adjusting to decreasing health and physical strength
- Adjusting to retirement and reduced or fixed income
- Adjusting to the death of a spouse
- Accepting one's self as an aging person
- Maintaining satisfactory living arrangements
- Redefining relationships with adult children
- Finding ways to maintain quality of life

Adapted from Erikson, E. H., Erikson, J. M., & Kivnick, H. Q. (1986). *Vital involvement in old age: The experience of old age in our time*. New York: W. W. Norton.

Long-term care facilities provide accommodations, 24-hour nursing care, and support services for people who cannot care for themselves at home but do not need hospital care. Assisted-living facilities are designed for residents who need only minimal to moderate care. Residents live independently in their own apartments and are provided with support services such as homemaking or personal care. Some assisted-living facilities are small group homes where residents share common eating and living areas. In some provinces, personal care homes are offered as a type of assisted-living facility. A **personal care home** is a private business that provides accommodation, meals, and supervision or assistance with personal care in a familylike atmosphere. Nursing services are not usually included in assisted-living facilities. Palliative care facilities such as hospices focus on providing care for adults who are dying. They can be publicly or privately funded.

You can also assist older adults and their families by providing information and answering questions as they make choices among care options. During the decision-making period, the actual move from a private home to an assisted-living or long-term care facility, and the time after the move, your role is to support the older adult and the family. You can provide information about the selection of a good assisted-living or long-term care facility (Box 24-3).

Canadian seniors, because of their changing health status, will need different types of care options during their life. These include health care and social services (Special Senate Committee on Aging, 2009). You, as a nurse, will have an important role in helping older adults transition between facilities. This role involves providing information and assisting them in finding the appropriate care options.

* BOX 24-3 FOCUS ON OLDER ADULTS

This information will help older adults in choosing housing options that are appropriate for their personal situations. Here are some factors for them to consider:

- **Needs:** Depending on how much support they need, different types of facilities offer different levels of support.
- **Preferences:** Each type of facility has advantages and disadvantages. Consider what is most important to the older adult when deciding.
- **Support Network:** How much support do they have from family and friends? This will determine the type of facility they need.
- **Eligibility:** In Canada, publicly funded facilities have eligibility criteria. Find out what they are so older adults know what options they have.
- **Availability:** Where the older adults live may determine if there is a facility that is available or if it has openings.
- **Finances:** Check out the cost of the facility to determine if the patient is able to pay the costs or needs to consider other options.
- **Timing:** At times the older adult will have to make a decision quickly. This situation can determine the options available to the older adult.



Adapted from the Government of Ontario. (2011). *Seniors care: Things to consider*. Toronto: Queen's Printer for Ontario. Retrieved from http://www.health.gov.on.ca/english/public/program/lc/tc4_consider.html

Assessing the Needs of Older Adults

Gerontological nursing offers creative approaches for maximizing the potential of older adults. The standards of practice of the Canadian Gerontological Nursing Association (2010) were developed to define the uniqueness and scope of gerontological nursing practice, which includes functions such as assessment. With comprehensive assessment information regarding an older person's strengths, resources, and limitations, you and the older adult can identify needs and problems and select interventions that maintain their physical abilities and create an environment for psychosocial and spiritual well-being. A thorough assessment requires you to actively engage older adults and provide them with enough time to share important information about their health. You should assess for changes in physiology, cognition, and psychosocial behaviour.

Nursing assessment must take into account five key points to ensure an age-specific approach: (1) the interrelation between physical and psychosocial aspects of aging, (2) the effects of disease and disability on functional status, (3) the decreased efficiency of homeostatic mechanisms, (4) the lack of standards for health and illness norms, and (5) altered manifestations of and responses to specific disease (Meiner & Leukenotte, 2006). Obtaining a comprehensive assessment of an older adult often takes more time than does an assessment of a younger adult because of the longer life and medical history and the potential complexity of that history. By planning to spend extra time with the assessment, you and an older adult are less likely to feel rushed. During the physical examination, you may find it necessary to allow rest periods or to conduct the assessment in several sessions because of the reduced energy and limited endurance experienced by some frail older adults.

Sensory changes may also affect data gathering. Your choice of communication techniques is influenced by any visual or hearing impairment experienced by the older adult. If older adults are unable to understand your visual or auditory cues, assessment data may be inaccurate or misleading. For example, if an older adult has difficulty hearing your questions, his or her responses may be inappropriate, and you may wrongly believe that he or she is confused. You can use the following communication techniques with an older adult who has a visual impairment:

- Sit or stand in front of the older adult in full view.
- Face the older adult while speaking; do not cover your mouth.
- Provide diffuse, bright, nonglare lighting.
- Encourage older adults with assistive devices such as glasses or magnifiers to use them.

You can use the following techniques with an older adult who has a hearing impairment:

- Speak directly to the older adult do not cover your mouth.
- Speak in clear, low-pitched tones at a moderate rate and volume.
- Reduce background noises; move to a quiet, private room.
- Ask whether they have a "good ear," and speak toward that ear.
- Encourage older adults to use assistive devices such as hearing aids or "microphone plus earphones."
- Make sure the hearing aid is working properly (check the battery, check that the hearing aid is turned on, adjust volume controls).
- Check the ear canal for cerumen impaction.

Memory deficits, if present, will affect the accuracy and completeness of the data collected. Information contributed by a family member or other caregiver, such as a history of allergies and documentation of immunizations, may be necessary to supplement the older adult's recollection of past medical events and information. You must use tact when involving another adult in the assessment interview with an older adult. The additional adult supplements the answers of the older person with their consent, but the older adult remains the focus of the interview.

Interpreters or cultural brokers must be present when an older adult does not speak your language. The spoken word must be interpreted within the context of the older adult's culture. To ensure culturally safe means of communication during assessment, (1) identify how the older adult wishes to be addressed (use culturally appropriate titles); (2) assess the health-related beliefs and practices of the older adult; and (3) know the beliefs and practices of the older adult's culture group with regard to spatial requirements, eye contact, and touch, and use them to establish rapport.

In older patients, signs and symptoms of diseases and laboratory values may be different from those in younger patients; the classic signs and symptoms of diseases may be absent, blunted, or atypical in older adults (Meiner & Leukenotte, 2006). These differences may result from age-related changes in organ systems and homeostatic mechanisms, from progressive loss of physiological and functional reserves, or from coexisting acute or chronic conditions. As a result, for example, an older adult with a urinary tract infection may present with confusion, loss of appetite, weakness, dizziness, or fatigue instead of fever, dysuria, frequency, or urgency; an older adult with pneumonia may have tachycardia, tachypnea, and confusion without the more common symptoms of fever and productive cough; and instead of substernal chest pain and diaphoresis, an older adult with a myocardial infarction may experience epigastric discomfort, restlessness, hypotension, confusion, or referred or no pain. Variations from the usual norms for laboratory values may result from age-related changes in cardiac, pulmonary, renal, and metabolic function (Wold, 2008). Examples of laboratory values that may be increased by these changes include, but are not limited to, levels of alkaline phosphatase, serum cholesterol, triglycerides, serum glucose (postprandial), and serum uric acid. Examples of laboratory values that may be decreased by the aging process include, but are not limited to, levels of serum calcium and serum creatine kinase, as well as creatinine clearance.

It is important to recognize the early indicators of acute illness in older adults: change in mental status, falls, dehydration, decrease in appetite, loss of function, dizziness, and incontinence. Two key principles of providing age-appropriate nursing care are timely detection of these cardinal signs of illness and a focus on finding underlying causes so that treatment can begin (Box 24-4). Attention is often not paid to underlying causes as a result of mistaken assumptions about normal aging (Wold, 2008). Many health challenges can coexist, which adds to the difficulty in isolating the causes of symptoms. Mental status commonly changes as a result of disease and psychological issues, but more often in relation to drug toxicity or adverse drug events. A fall is a complex event, and careful investigation is necessary to find out whether it has environmental causes or is the symptom of a new-onset illness; such illnesses include cardiac, respiratory, musculoskeletal, neurological, urological, and sensory disorders. Dehydration is

► BOX 24-4

Examples of Indicators of Acute Illness in Different Settings

Hospital

- Confusion is not inevitable. Look for neurological events, new medication, or the presence of risk factors for delirium.
- Many hospitalized older adults suffer from chronic dehydration accelerated by acute illness.
- Not all older adults have fevers with infection. Symptoms may include increased respiratory rate, falls, incontinence, or confusion.

Nursing Home

- Health care providers often undertreat pain in older adults, especially those with dementia. Look for nonverbal cues such as grimacing or resistance to care.
- Decline in functional ability (even a minor one, such as the inability to sit upright in a chair) is a signal of new illness.
- Residents with less muscle mass—both frail and obese adults—are at heightened risk for toxicity from protein-binding drugs such as phenytoin (Dilantin) and warfarin (Coumadin).
- Urinary or fecal incontinence is often a sign of the onset of a new illness.

Ambulatory Care

- Complaints of fatigue or decreased ability to perform usual activities are signs of anemia, thyroid problems, depression, or neurological or cardiac problems.
- Severe gastrointestinal problems in older adults do not always manifest with the same acute symptoms seen in younger patients. Ask about constipation, cramping sensations, and changes in bowel habits.
- Older adults reporting increased dyspnea and confusion, especially those with a cardiac history, need to go to the emergency department; these are the most common manifestations of myocardial infarction in this population.
- Depression is common among older adults with chronic illnesses. Watch for lack of interest in formerly pleasurable activities, and be alert to significant personal losses or changes in role or home life.

Home Care

- Investigate all falls, focusing on balance, gait, and neurological issues.
- Monitor older adults with late-stage heart disease for loss of appetite, which is an early symptom of impending heart failure.
- Monitor for drug-drug interactions in older patients who are seeing more than one health care provider and taking multiple medications.

Adapted from Amella, E. J. (2006). Presentation of illness in older adults. If you know what you are looking for, think again. *AORN Journal*, 83(2), 372–389.

common in older adults because the thirst response is reduced, which results in less water intake, and because less free water is available as a consequence of decreased muscle mass. Vomiting and diarrhea can accompany the onset of an acute illness, and older adults are then at risk for further dehydration. Decrease in appetite is a common symptom with the onset of pneumonia, heart failure, and urinary tract infection. Loss of functional ability occurs either in a subtle manner over time or suddenly, depending on the underlying cause. Thyroid disease, infection, cardiac or pulmonary conditions, metabolic disturbances, and anemia are common causes of functional decline, so you need to identify them early and notify care providers

so that proper treatment can be initiated. Dizziness is a common sign of various acute illnesses, including anemia, arrhythmia, infection, myocardial infarction, stroke, and brain tumour. New-onset urinary incontinence in an older adult is often associated with a urinary tract infection, but it can also be a symptom of an electrolyte abnormality or adverse drug event.

Physiological Changes

Perception of well-being can define quality of life. Understanding a patient's perceptions about health status is essential for the accurate assessment and development of clinically relevant interventions. Older adults' concepts of health generally depend on personal perceptions of functional ability. Therefore, older adults engaged in ADLs usually consider themselves healthy, whereas those whose activities are limited by physical, emotional, or social impairments may perceive themselves as ill.

Many observed physiological changes in older adults are called "normal." Finding such changes during an assessment is not unexpected. These physiological changes are not always pathological processes, but they may make older adults more vulnerable to some common clinical conditions and diseases. Some older adults experience all of these physiological changes, and others experience only a few. The body changes continuously with age, and specific effects on particular older adults depend on health, lifestyle, stressors, and environmental conditions. You should know about these commonly experienced changes in order to provide appropriate care for older adults and to assist with adaptation to the changes. Common physiological changes are summarized in Table 24-1.

General Survey. The general survey occurs during your initial encounter with an older adult and includes a quick, but careful, head-to-toe scan of the patient, which you should document in a concise description. An initial inspection of an older adult might reveal whether eye contact and facial expression are appropriate to the situation, as well as common aging changes such as facial wrinkles, grey hair, loss of body mass in the extremities, and an increase of body mass in the trunk.

Integumentary System. With aging, the skin loses resilience and moisture. The epithelial layer thins, and elastic collagen fibres shrink and become rigid. Wrinkles of the face and neck reflect lifelong patterns of muscle activity and facial expressions, the pull of gravity on tissue, and diminished elasticity.

Spots and lesions may also be present on the skin. Smooth, brown, irregularly shaped spots ("age spots," or senile lentigo) initially appear on the backs of the hands and on forearms. Small, round, red or brown cherry angiomas may be found on the trunk. Seborrhic lesions or keratoses may appear as irregular, round or oval, brown, watery lesions. Years of sun exposure contribute to the aging of the skin and may lead to premalignant and malignant lesions. In examining skin lesions, you must rule out three malignancies related to sun exposure: melanoma, basal cell carcinoma, and squamous cell carcinoma (see Chapter 31).

Head and Neck. The facial features of older adults become more pronounced as a result of loss of subcutaneous fat and skin elasticity. Facial features may appear asymmetrical because of missing teeth or improperly fitting dentures. In addition, common vocal changes include a rise in pitch and a loss of power and range.

Visual acuity declines with age. This may be the result of retinal damage, reduced pupil size, development of opacities

in the lens, or loss of lens elasticity. Presbyopia (gradual decline in the ability to focus on close objects) is common in older adults. The ability to see in darkness is reduced, and adaptation to abrupt changes from dark areas to light areas (and the reverse) is slower. Ambient lighting (soft, indirect light that usually illuminates the entire room) is generally the best lighting for older adults. However, older adults also have increased sensitivity to the effects of glare, and interventions to increase ambient light should not increase glare. Changes in colour vision and discoloration of the lens make it difficult to distinguish between blues and greens and among pastel shades.

Auditory changes are often subtle. The earliest losses of hearing acuity may be ignored until friends and family members comment on it. Presbycusis, a common age-related change in auditory acuity, is a decrease in the ability to hear high-pitched sounds and sibilant consonants such as "s," "sh," and "ch." Before you assume that presbycusis is present, you must inspect the patient's external auditory canal for the presence of cerumen (earwax). Impacted cerumen is an easily treated cause of diminished hearing acuity.

Taste buds atrophy and lose sensitivity. Older adults are less able to discern among salty, sweet, sour, and bitter tastes. The sense of smell is also decreased, which further reduces the sense of taste. Salivary secretion is reduced as well.

Thorax and Lungs. Because of changes in the musculoskeletal system, the configuration of the thorax sometimes changes. After the age of 55 years, respiratory muscle strength begins to decrease. The anteroposterior diameter of the thorax increases. The incidence of osteoporosis is increased in older adults, and vertebral changes caused by osteoporosis can lead to dorsal kyphosis, the curvature of the thoracic spine sometimes called "dowager's hump." Calcification of the costal cartilage can cause decreased mobility of the ribs. The chest wall gradually becomes stiffer. Lung expansion decreases. If kyphosis or chronic obstructive lung disease is present, breath sounds are distant.

Heart and Vascular System. Decreased contractile strength of the myocardium results in decreased cardiac output. This is significant when an older adult experiences stress from anxiety, excitement, illness, or strenuous activity. The body tries to compensate for decreased cardiac output by increasing the heart rate during exercise. However, after exercise, it takes longer for an older adult's rate to return to baseline.

Systolic or diastolic blood pressure, or both, may be abnormally elevated. More than 50% of older adults have systolic hypertension (systolic pressure >140 mm Hg) or diastolic hypertension (diastolic pressure >90 mm Hg). Although it is a common chronic condition, hypertension is not a normal aging change; it predisposes older adults to heart failure, stroke, renal failure, coronary heart disease, and peripheral vascular disease.

Peripheral pulses become frequently weaker in the lower extremities, although they are still palpable. Older adults may report that their lower extremities are cold, particularly at night. Changes in the peripheral pulses in the upper extremities are less common.

Breasts. In older women, the breasts sag as a result of decreased muscle mass, tone, and elasticity. Atrophy of glandular tissue, coupled with more fat deposits, causes breasts to become slightly smaller, less dense, and less nodular. Gynecomastia (enlarged breasts in men) may be caused by medication side effects, hormonal changes, or obesity. Both older men and women are at risk for breast cancer.

► TABLE 24-1 Common Physiological Changes With Aging

Anatomical Part	Common Changes	Anatomical Part	Common Changes
System		Sensory	
Integument	Loss of skin elasticity (resulting in wrinkles, sagging, easily tears) Decrease in adipose tissue Decrease efficiency of sweat glands Decreased secretions of sebaceous glands, and increased dryness of the skin	Eyes	Decreased ability to focus on near objects (presbyopia) Difficulty adjusting to changes from light to dark Yellowing of the lens Altered perception of colours Increased sensitivity to glare Smaller pupils
Respiratory	Decreased cough reflex Decreased removal of mucus, dust, irritants from airways (decreased cilia) Inefficiency of gas exchange Increased chest wall rigidity Fewer alveoli, increased airway resistance Increased risk of respiratory infections	Ears	Loss of ability to hear high-frequency tones (presbycusis) Thickening of tympanic membrane Sclerosis of inner ear Possible buildup of cerumen (earwax)
Cardiovascular	Thickening of blood vessel walls Increased peripheral resistance Loss of vessel elasticity Lower cardiac output Decreased baroreceptor sensitivity Increased pulmonary vascular tension Increased systolic blood pressure Decreased peripheral circulation	Taste	Often diminished; possibly fewer taste buds
Gastrointestinal	Periodontal disease Loss of teeth Decrease in saliva, gastric secretions, and pancreatic enzymes Changes in smooth muscle, with decreased esophageal peristalsis and small intestinal motility	Smell	Often diminished
Musculoskeletal	Decreased muscle mass and strength Decalcification of bones Degenerative joint changes Dehydration of intervertebral disks (decreased height)	Touch	Decreased skin receptors
Neurological	Degeneration of nerve cells Decrease in neurotransmitters Decrease in rate of conduction of impulses	Proprioception	Decreased awareness of body positioning in space
		Genitourinary	Decreased ability to respond to water load deficits Decreased renal blood flow Decreased bladder capacity Men: enlargement of prostate Women: reduced sphincter tone
		Reproductive	
		Female	Decreased estrogen production Degeneration of ovaries Atrophy of vagina, uterus, breasts
		Male	Diminished sperm count Smaller testes Less firm and slower erections
		Endocrine	
		General	Alteration in hormone production with decreased ability to respond to stress
		Thyroid Thymus	Decreased secretion Involution of thymus gland
		Cortisols, glucocorticoids	Increased levels of anti-inflammatory hormones
		Pancreas	Increased fibrosis, decreased secretion of enzymes and hormones

Data from Touhy, T. A., Jett, K. F., Boscart, V., & McCleary, L. (2012). *Ebersole & Hess' geriatric nursing and healthy aging* (1st Cdn. ed.). Toronto: Elsevier Canada.

Gastrointestinal System and Abdomen. Aging leads to an increase in the amount of fatty tissue in the trunk. As a result, the abdomen increases in size. Because muscle tone and elasticity decrease, the abdomen also becomes more protuberant. Gastrointestinal function changes include a slowing of peristalsis and alterations in secretions. Older adults may experience these changes as the development of intolerance to certain foods and as discomfort caused by delayed gastric emptying. Alterations in the lower gastrointestinal tract may lead to constipation, flatulence, or diarrhea.

Reproductive System. Changes in the structure and function of the reproductive system occur as the result of hormonal alterations. Menopause is related to a reduced responsiveness of the ovaries to pituitary hormones and a resultant

decrease in estrogen and progesterone levels. In men, fertility does not cease in association with aging. Spermatogenesis begins to decline during the fourth decade but continues into the ninth. The changes in reproductive structure and function, however, do not affect libido. Sexual activity can become less frequent as a result of illness, death of a sexual partner, decreased socialization, or loss of sexual interest.

Urinary System. Hypertrophy of the prostate gland may develop in older men. The gland enlarges, and pressure is displaced to the neck of the bladder. As a result, urinary retention, frequency, incontinence, and urinary tract infections may occur. In addition, prostatic hypertrophy can result in difficulty initiating voiding and maintaining a urinary stream. Benign prostatic hypertrophy must be distinguished from

cancer of the prostate. Cancer of the prostate is the malignancy most frequently diagnosed in men older than 70 years, and it results in the death of 1 per 27 men in whom it is diagnosed (Canadian Cancer Society, 2008).

Urinary incontinence is an abnormal condition, although it is experienced by 50% of women older than 45 years (Canadian Continence Foundation, 2007). The prevalence of incontinence increases with age. Older women, particularly those who have borne children, can experience stress incontinence, an involuntary release of urine that occurs when they cough, sneeze, or lift an object. This type of incontinence results from a weakening of perineal and bladder muscles. Other types of urinary incontinence are transient, urge, overflow, functional, reflex, and mixed incontinence (see Chapter 43). The Registered Nurses' Association of Ontario (RNAO) (2005b) recommended assessing risk factors for urinary incontinence, which include individual factors (fluid intake, medications, functional ability, and medical history) and environmental factors.

Musculoskeletal System. With aging, muscle fibres are reduced in size. Muscle strength diminishes in proportion to the decline in muscle mass. Bone mass also declines. Older adults who exercise regularly do not lose as much bone and muscle mass or muscle tone as those who are inactive. Of Canadian women older than 50 years, 25% have osteoporosis (Osteoporosis Canada, 2008). Women who maintain calcium intake throughout life and into menopause have less bone demineralization than women with low calcium intake. Older men with poor nutrition and decreased mobility are also at risk for demineralization. One in eight men in Canada has osteoporosis.

Neurological System. The decrease in the number of neurons in the nervous system that begins in the middle of the second decade can lead to changes such as the sensory disturbances described earlier. In addition, older adults may experience a decreased sense of balance or uncoordinated motor responses. Older adults frequently report alterations in the quality and the quantity of sleep, including difficulty falling asleep, difficulty staying asleep, difficulty falling asleep again after waking during the night, waking too early in the morning, and excessive daytime napping (see Chapter 40).

Functional Changes

Declines in physical, psychological, cognitive, and social function that can occur with aging are usually linked to illness or disease and its degree of chronicity. However, the complex relationship among all of these areas ultimately influences an older adult's functional abilities and overall well-being. It is difficult for older adults to accept the changes that occur in all the areas of their lives, which in turn have a profound effect on function. Some older adults deny the changes and continue to expect the same performance from themselves regardless of age. Conversely, some overemphasize these changes and prematurely limit their activities and involvement in life. Also, the fear of becoming dependent is overwhelming for an older adult who is experiencing functional decline as a result of aging. You should educate older adults to promote understanding of age-related changes, appropriate lifestyle adjustments, and effective coping. Factors that promote the highest level of function in all the areas include a healthy, well-balanced diet; paced and appropriate activity; regularly scheduled visits with a health care provider; regular participation in meaningful activities; use of stress management techniques; and avoidance of alcohol, tobacco, and illicit drugs. *Functional status* in older adults ordinarily refers to the capacity and safe

performance of ADLs and is a sensitive indicator of health or illness in older adults. ADLs are essential to independent living; therefore, you must carefully assess whether an older adult has changed the way in which he or she completes these tasks. In fact, a sudden change in function, as evidenced by a decline or change in an older adult's ability to perform any one or combination of ADLs, is often a sign of the onset of an acute illness, pain, or worsening of a chronic problem. Pneumonia, urinary tract infection, dehydration, electrolyte disturbances, and delirium are examples of acute illnesses that may manifest as a change in function. Worsening of chronic conditions such as diabetes, cardiovascular disease, and chronic lung disease can also manifest as a change in function.

Various health care providers in a range of different settings are able to perform a functional assessment. Several standardized functional assessment tools are widely available; an online collection of tools is available at <http://www.geronurseonline.org>. When you identify a decline in function, focus nursing interventions on maintaining, restoring, and maximizing the older adult's functional status so that he or she can maintain independence while preserving dignity.

Cognitive Changes

A common misconception about aging is that cognitive impairments are widespread among older adults. Forgetfulness is not an expected consequence of aging. Older adults often fear that they are, or soon will be, cognitively impaired. Younger persons often assume that older adults are confused and no longer able to handle their affairs. Structural and physiological changes within the brain—such as reduction in the number of cells, deposition of lipofuscin and amyloid in cells, and change in neurotransmitter levels—are normal with aging and are observed in older adults whether they do or do not have cognitive impairment. Symptoms of cognitive impairment such as disorientation, loss of language skills, loss of the ability to calculate, and poor judgement are not normal aging changes. When you identify these changes during the assessment, you must further investigate the underlying causes.

The three common conditions affecting cognition are delirium, dementia, and depression (Table 24-2). You may find that distinguishing among these three conditions is challenging but essential for selecting appropriate nursing interventions. The RNAO (2010) published revised best practice guidelines to screen for delirium, dementia, and depression in older adults. Appropriate nursing interventions specifically address the cause of the cognitive impairment.

Delirium. Delirium, or acute confusional state, is a potentially reversible cognitive impairment that often has a physiological cause. Physiological causes of delirium include, but are not limited to, electrolyte imbalances, cerebral anoxia, hypoglycemia, medications, drug effects, tumours, subdural hematomas, pain, infection, and cerebrovascular infection, infarction, or hemorrhage. Delirium in older adults sometimes accompanies systemic infections and may be the presenting symptom for pneumonia or urinary tract infection. Delirium may also have environmental causes (e.g., sensory deprivation, unfamiliarity with surroundings) or psychosocial causes (e.g., emotional distress, pain). Although delirium may occur in any setting, an older adult in the acute care setting is especially at risk because of predisposing factors (physiological, psychosocial, and environmental) in combination with the medical condition that led to the hospital admission.

Delirium is characterized by fluctuations in cognition, mood, attention, arousal, and self-awareness. Other signs may

► **TABLE 24-2** A Comparison of the Clinical Features of Delirium, Dementia, and Depression

Clinical Feature	Delirium	Dementia	Depression
Onset	Acute or subacute, depending on cause; often occurs at twilight or in darkness	Chronic and generally insidious, depending on cause	Chronic and generally insidious, depending on cause
Course	Short episodes; diurnal fluctuations in symptoms; worse at night, in darkness, and on awakening	Long episodes; no diurnal effects; symptoms progressive and yet relatively stable over time	Diurnal effects; typically worse in the morning; fluctuations situational but less so than those of delirium
Progression	Abrupt	Slow but uneven	Variable, rapid, or slow but even
Duration	Hours to less than 1 month; seldom longer	Months to years	At least 6 weeks; can last several months to years

Adapted from Rapp, C. G., Mentis, J. C., & Titler, M. G. (2001). Acute confusion/delirium protocol. *Journal of Gerontological Nursing*, 27(4), 21–33.

BOX 24-5 NURSING STORY

Pain and Delirium

Mr. D. R. was a 75-year-old man who underwent an elective right hip arthroplasty and was given patient-controlled anesthesia (PCA) for 48 hours. During that time, he did not use any additional dosages of morphine and was drowsy but alert and moving well. Approximately 10 hours after the PCA had been discontinued, he started to have episodes of confusion, in which he would not remember where he was. His wife, who was visiting him, came to the nurses' station, concerned about his confusion. The nurse measured his vital signs, which appeared to be normal with a slightly elevated pulse, but he had no fever. The nurse asked Mr. D. R. whether he was having pain; he responded, "Not really, just not feeling right." Throughout the night, he became increasingly confused. The nurse on the night shift applied her knowledge of postoperative delirium. Looking back at the medical record, she realized that Mr. D. R. had not had anything to control pain since the PCA had been discontinued. She also asked him whether he had pain, and he again said, "Not really." She used the Faces Pain Scale to assess Mr. D. R.'s pain, as recommended by the Hartford Foundation for Geriatric Nursing (Flaherty, 2007); his rating suggested that he was indeed having pain. The nurse gave him oral pain medication on a regular basis, and by morning, he was alert.

be hallucinations, occasional incoherent speech, disturbed sleep–wake cycle, and disorientation. The onset of delirium is typically sudden, and symptoms and severity fluctuate rapidly. The presence of delirium necessitates prompt assessment and intervention. The cognitive impairment secondary to delirium is usually reversed once the cause of delirium is identified and treatment is started, unless permanent brain injury has occurred. The story in Box 24-5 is a true one and exemplifies the importance of finding and treating the cause of delirium.

Treatment of delirium is focused on determining causative factors; however, prevention is also important. To prevent delirium and maintain patient functioning, you must address causative factors, which may be multidimensional. A strategy for delirium prevention and treatment that targets risk factors is implementation of a delirium protocol. An example of a protocol was described by Gillis and MacDonald (2006). In this protocol, you would assess the patient's cognition on a regular basis, using an assessment tool such as the Confusion Assessment Method (Waszynski, 2007). A medication profile and therapeutic environmental modification are also aspects of this protocol.

Dementia. Dementia is a syndrome consisting of a number of symptoms that include loss of memory, judgement, and reasoning and changes in mood, behaviour, and communication abilities. Deterioration of cognitive function leads to a decline in the ability to perform basic and instrumental ADLs. Unlike delirium, dementia is characterized by gradual, progressive, irreversible cerebral dysfunction. Because of the close resemblance of delirium to dementia, the presence of delirium must be ruled out whenever dementia is suspected. The Alzheimer Society of Canada (2008) classifies five major types of dementia: Alzheimer's disease, diffuse Lewy body disease, frontotemporal dementia, Creutzfeldt-Jacob dementia, and vascular dementia. The most common form of dementia is Alzheimer's disease. In Canada, approximately 34.5% of adults older than 85 years have dementia, in comparison with 2.4% of those aged 65 to 74 years (Alzheimer Society of Canada, 2008).

The cause of Alzheimer's disease is not known, and although several theories are being studied, none is definitive. Cholinesterase-inhibiting medications—memantine (Ebixa), donepezil (Aricept), rivastigmine (Exelon), and galantamine (Reminyl)—are currently prescribed to slow progression of symptoms. These medications prevent breakdown of the neurotransmitter acetylcholine by the enzyme cholinesterase. It is hypothesized that by increasing the amount of acetylcholine available to transmit impulses among neurons, cognition in some older adults with Alzheimer's disease will improve.

The characteristic progressive symptoms of Alzheimer's disease are loss of memory (amnesia), loss of the ability to recognize objects and people (agnosia), loss of the ability to perform familiar tasks (apraxia), and loss of language skills (aphasia). As Alzheimer's disease progresses, the affected adult becomes more dependent on caregivers for assistance with ADLs. Safety issues must be addressed as the disease progresses and the ability to judge risks diminishes.

Like Alzheimer's disease, diffuse Lewy body disease is progressive. The features of diffuse Lewy body disease include dementia, fluctuating cognition, visual or auditory hallucinations (or both), and the motor features of Parkinsonism.

Frontotemporal dementia has an insidious onset and progresses slowly. Early symptoms include poor hygiene, lack of social tact, hyperorality, and sexual disinhibition. Incontinence is also an early symptom in frontotemporal dementia, whereas it is a late symptom in the more common Alzheimer's disease. Repetitive behaviours (wandering, clapping, singing, picking up objects) are frequently observed. Safety and behaviour managements are major concerns for caregivers.

A sudden onset of memory loss, behaviour changes, or difficulties with speech and movement occur with

Creutzfeldt-Jakob disease (CJD). CJD is a rare, rapid, and fatal form of dementia caused by infectious agents called *prions*. Two types of CJD exist. *Classical CJD* (also called *sporadic CJD*) occurs at random. *Variant CJD* (vCJD) is a disease linked to eating beef products from cattle with bovine spongiform encephalopathy, also called “mad cow disease.” The infectious agent attacks the central nervous system, and the infection is fatal if illness develops. Both types of CJD typically cause memory loss and behavioural changes (Alzheimer Society of Canada, 2008).

The cause of vascular dementia is interruption of blood supply to areas of the brain by thromboembolism, hemorrhage, or ischemia. Symptoms of vascular dementia vary according to the areas of the brain affected. Progression of vascular dementia may be either stepwise, with repeated episodes of damage to the brain over time, or steadily progressive. Management of vascular dementia parallels the recommendations for cerebrovascular disease (i.e., reduction of risk factors by treatment of hypertension, hyperlipidemia, carotid disease, arrhythmias, diabetes mellitus, and polycythemia vera). Because the use of nicotine has been linked with vascular disease, older adults with vascular dementia should stop or reduce their use of tobacco products. If an older adult has a cardiac arrhythmia such as atrial fibrillation, anticoagulant therapy may be indicated to reduce the risk of thromboembolism.

In the nursing management of older adults with any form of dementia, you must consider the needs of the patient and the needs of the family. Those needs change because the progressive nature of dementia leads to increased cognitive deterioration. In addition to the patient’s physical needs, his or her safety needs and psychosocial needs must be considered. The patient’s family needs information and support. Nursing care objectives are the promotion of the use of remaining functional abilities and behavioural interventions to decrease the incidence of disruptive behaviours.

The Alzheimer Society of Canada (2008) has compiled suggestions for care of adults with dementia. The most challenging behaviours are those that include verbal and physical aggression. You should be calm and reassuring, look for an immediate cause, try distracting the patient, and, if safety is an issue, leave the situation and get assistance. Restraints cause physical harm and are not an efficacious alternative. Minimal restraint (policy of least restraint) for the shortest period of time should be used only as the last resort when safety is an issue.

Depression. Late-life depression may be experienced by 15% to 20% of older adults who live in the community (Canadian Coalition for Seniors’ Mental Health, 2008). Depression reduces happiness and well-being, contributes to physical and social limitations, complicates the treatment of concomitant medical conditions, and increases the risk of suicide. The manifestation of depression in older adults differs from that in younger adults. Older adults are more likely to talk about being “blue” or “down in the dumps” and may express feelings of diminished life satisfaction (Miller, in press). The mental health of seniors is a major issue facing older Canadians. It is estimated that 20% of Canadians older than 65 years are living with mental illness. Best practice guidelines for mental health treatment have been developed by the Canadian Coalition for Seniors’ Mental Health (2008).

Delirium and depression, both reversible disorders, are often mistaken for irreversible dementia in older adults because cerebral dysfunction and cognitive impairment occur with these conditions, as well as with dementia. Careful and

thorough assessment of older adults with cognitive impairment is essential to distinguish among delirium, dementia, and depression. As a beginning nurse, you may choose to consult with a clinical nurse specialist in gerontology. Accurate assessment is necessary to select appropriate nursing interventions.

Psychosocial Changes

The psychosocial changes that occur with aging involve changes in roles and relationships. Roles and relationships within the family change as parents become grandparents, as adult children become caregivers for aging parents, or as spouses become widows or widowers. Group membership roles and relationships change as older adults retire from work, move from a familiar neighbourhood, or stop attending social activities because of declining health status.

You should assess both the nature of the psychosocial changes facing an older adult and the adaptation of that adult to those changes. In the assessment, ask how the patient feels about himself or herself, about himself or herself in relation to others, and about himself or herself as aging. Areas to be addressed during the assessment include the family, intimate relationships, past and current occupation, finances, housing, social networks, activities, and spirituality. Specific topics related to these areas include retirement, housing and environment, social isolation, abuse, sexuality, and death.

Retirement. The great majority of Canadian older adults are retired; 6% of them are employed outside the home (Park, 2011). A large number (85%) of employed older adults work on a part-time basis (Figure 24-2). Many return to paid work after initial retirement; in 2002, 22% of Canadian retirees reported they had returned to paid work (Park, 2011). Older adults retired from employment outside the home are challenged to cope with the loss of that work role. Older adults who worked at home and the spouses of those who worked outside the home also face role changes as they retire.

Retirement is often mistakenly associated with passivity and seclusion. In actuality, it is a stage of life characterized by transitions and role changes. The psychosocial stresses of retirement may be related to role changes within the marital relationship or within the family and to loss of role. Problems may arise in relation to social isolation and finances. Retirement, which may be mandatory or voluntary, occurs at a



Figure 24-2 This older adult works part-time at a sporting goods store.

variety of ages. Regardless of the age at retirement, it is one of the major turning points in life.

Planning for retirement is an important, advisable task for middle-aged individuals. People who plan in advance for retirement generally have a smoother transition into that stage of life. Financial planning for retirement, although important, is only one aspect of retirement planning. Planning begins with consideration of the “style” of retirement desired and includes an inventory of interests, current skills, and general health. Meaningful retirement planning is critical because retirement can last for 30 years or more.

Retirement has an impact on other individuals besides the retired adult. Spouses, adult children, and grandchildren are all affected. When the spouse is still working, the retired adult faces time alone. For example, the working spouse may have new ideas about the amount of participation in housework expected of the retired adult. Friction may develop when the plans of the retired adult conflict with the work responsibilities of the working spouse. The working spouse's expectations of the retired adult must be clarified. For couples, adjustment to retirement is affected by the quality of communication with each other, their process of decision making about issues such as money or activities, their adherence to either traditional or shared role orientations, and their level of affection and intimacy (Ebersole et al., 2008). Adult children may expect the retired adult to become an automatic babysitter for grandchildren.

Loss of the work role has a major impact on some retired people. When so much of life has revolved around work and personal relationships at work, loss of the work role may be devastating. Personal identity may be rooted in the work role, and with retirement, a new identity must be constructed. The structure imposed on daily life by a work schedule is also lost, as are the social exchanges and interpersonal support that occur in the workplace. In the adjustment to retirement, older adults are challenged to develop a personally meaningful schedule and a supportive social network.

The most powerful factors that influence the retired adult's satisfaction with life are health status, the option to continue working, and sufficient income (Ebersole et al., 2008). Positive expectations also contribute to satisfaction in retirement. You can help an older adult and family prepare for retirement by discussing several key areas, including relationships with spouse and children, meaningful activities to replace the work role, adjusting or rebuilding social networks, issues related to the promotion and maintenance of income and health, and long-range planning, including wills and advance directives.

Social Isolation. Social isolation and loneliness are significant issues for older adults regardless of gender and geographic location (Cornwell & Waite, 2009). Social isolation is lack of contact with other people. Loneliness is dissatisfaction with the level of social contact. Isolation exists in two forms: a choice to not interact with others or a response to conditions that inhibit the ability or opportunity to interact with others (Ebersole et al., 2008). For example, geographic dispersion of families leads to decreased opportunities for interaction among family members. Regardless of whether isolation is a choice for older adults, they are vulnerable to its consequences.

Living alone and having multiple chronic illnesses are factors contributing to social isolation and loneliness (Cornwell & Waite, 2009). Some older adults see themselves as unattractive and rejected because of changes in their personal appearance as a result of normal aging or because of body

image changes caused by illness or surgery (Ebersole et al., 2008). Older adults who are confused or incontinent, who are unable to communicate, who are institutionalized, or who are poor or homeless may feel isolated.

You can assist lonely older adults to rebuild social networks and reverse patterns of isolation (Ebersole et al., 2008). Many communities have outreach programs designed to make contact with isolated older adults. Outreach programs, such as Meals on Wheels, may help meet nutritional needs; daily telephone calls by volunteers may help meet socialization needs; and outings may help meet needs for activities. Social service agencies in most communities welcome older adults as volunteers and provide them with the opportunity to serve and to be served. Other organizations within communities such as religious institutions, colleges, and libraries offer a variety of programs for older adults that increase the opportunity to meet people with similar activities, interests, and needs.

Abuse. Elder abuse is the mistreatment of an older adult by other people who are in a position of trust or power or who are responsible for the adult's care. Neglect is commonly associated with abuse. For example, elder abuse includes not performing an action (inaction) that a caretaker has a duty to perform, such as not providing medications to an older adult who needs them (Canadian Network for the Prevention of Elder Abuse, 2008). Types of abuse are as follows:

- Physical abuse: use of physical force that may result in bodily injury, physical pain, or impairment
- Sexual abuse: nonconsensual sexual contact of any kind, which includes sexual contact with any adult incapable of giving consent
- Psychological or emotional abuse: infliction of anguish, emotional pain, or distress through verbal or nonverbal acts
- Material abuse (financial abuse): illegal or improper exploitation of an older adult's funds, property, or assets
- Neglect: the intentional or unintentional harmful behaviour on the part of an informal or formal caregiver in whom the older adult has placed his or her trust
- Self-neglect: behaviour by an older adult that threatens their health and safety such as not eating

In most provinces in Canada, elder abuse must be reported. As a nurse, you play an important role in assessment, recognition, and reporting of elder abuse, as well as its prevention, through education and resources for families (Box 24-6).

Sexuality. Sexuality is increasingly recognized as an important factor in the lives of older adults. All older adults, whether healthy or frail, need to express sexual feelings. Sexuality involves love, warmth, sharing, and touching, not just the act of intercourse. Sexuality is linked with identity and validates the belief that people can give of themselves to others and have the gift appreciated.

Maintaining sexual health requires integration of somatic, emotional, intellectual, and social aspects of the sexual being. To help an older adult achieve or maintain sexual health, you should understand the physical changes in sexual response (see Chapter 26). You should provide privacy for any discussion of sexuality and should maintain a nonjudgemental attitude. Open-ended questions inviting the patient to explain sexual activities or concerns may elicit more information than do closed-ended questions about specific activities or symptoms. Older adults may appreciate information about the typical age-related changes in sexuality. Information about the prevention of sexually transmitted infections should be included when appropriate. The libido does not decrease in

► BOX 24-6

Elder Abuse: Signs and Action Required**Signs**

Physical signs of abuse
 Isolation from others
 Withdrawal
 Confusion, depression, or anxiety
 Changes in hygiene
 Seeming fearful around certain people
 Fear or worry when talking about money
 Feeling of the victim that he or she is to blame
 Verbalized threats against the victim

Action Required

Assess the presence of physical danger and if imminent danger report it to police
 Contact Family Violence Hot Line
 Support the victim's decision to leave the situation or to stay in it
 Develop a workable safety plan
 Provide specific information about places of safety

Adapted from Ebersole, P., Hess, P., Touhy, T., Jett, K., & Luggen, A. (2008). *Toward healthy aging: Human needs and nursing response* (7th ed.). St Louis, MO: Mosby.

older adults, although frequency of sexual activity may decline. An older woman who does not understand physical changes affecting sexual activity may be concerned that her sex life is nearly over. The older man may feel the same when he discovers a change in the firmness of his erection, a decreased need for ejaculation with each orgasm, or a longer recovery period between episodes of intercourse.

In addition to the physical changes that affect sexual functioning, many older adults use prescription medications that depress libido, such as antihypertensives, antidepressants, sedatives, and hypnotics. Some drugs increase libido in older adults. For example, phenothiazines increase sexual desire in women, and levodopa has a similar effect in men.

While considering an older adult's need for sexual expression, you must not ignore the important need to touch and be touched. Touch is an overt expression with many meanings and is an important part of sexuality in some cultures. Touch can complement traditional sexual methods or serve as an alternative sexual expression when physical intercourse is not desired or possible, and thus it can serve as an important method of achieving intimacy (Atkinson, 2006). Before using touch, you should respect the fact that it may not be appropriate for some older adults because of culturally associated meanings. Experience in caring for older adults, in combination with the ability to establish therapeutic connection, enables you to learn how to explore patients' sexual concerns. Knowing an older adult's sexual needs allows you to incorporate this information into the nursing care plan.

The sexual preferences of older adults are as diverse as those of younger persons. Not all older adults are heterosexual. Little information regarding older homosexual adults and their health care needs is available. To be effective caregivers for older homosexual patients, you need to be aware of your own beliefs about sexuality and the potential impact of those beliefs on your ability to provide care.

Improving communication and creating open and supportive environments of care are necessary to promote successful, healthy sexual expression.

You may find that you are called on to advise older adults and help other health care providers understand the sexual needs of older adults. You may feel uncomfortable counselling older adults about sexual health and need not feel obligated to do so. But you should be prepared to refer older adults to appropriate professional counsellors.

Housing and Environment. Most Canadians want to stay in their communities as long as possible (Special Senate Committee on Aging, 2009). However, housing choices are strongly determined by an older adult's ability to live independently. Changes in social roles, family responsibilities, health status, retirement, and income influence this ability. For example, physical impairments may necessitate relocation to a smaller, single-level home. Because of health problems, an older adult may need to live with relatives or friends or move to an assisted-living or long-term care facility. A change in living arrangements may require an extended period of adjustment during which assistance and support from health care providers, friends, and family members are needed.

Some older adults choose to live with family members. Others prefer their own homes or apartments near their families. Leisure or retirement communities provide older people with living and social opportunities in a one-generation setting. Federally subsidized housing, where available, offers apartments with communal, social, and, in some cases, food service arrangements. However, although they may change residence, the majority of Canadian older adults report that they enjoy good housing (National Advisory Committee on Aging [NACA], 2006). There are Canadians, however, who because of poverty are unable to find adequate housing (Special Senate Committee on Aging, 2009). The Special Senate Committee on Aging (2009) has recommended that elimination of poverty for older adults be a goal of the Canadian government. When assisting older adults with housing needs, you should assess activity level, financial status, availability of access to public transportation and community activities, environmental hazards, and support systems. Housing choices should also account for anticipated future needs of the patients. A housing unit with only one floor and without exterior steps may be a prudent choice for an older adult with severe arthritis who has already had some lower extremity joint replacement surgeries and anticipates the need for future surgeries.

Housing and environment have a major impact on the health of older adults. The environment can support or hinder physical and social functioning, can enhance or drain energy, and can complement or tax existing physical changes such as vision and hearing. For example, older adults can most easily see the colours red, orange, and yellow; in contrast, they have difficulty distinguishing between green and blue and among pastel shades. To help older adults in health care settings find their rooms, pictures or other decorations near their doors can be used as landmarks. To improve perception of the boundaries of halls and rooms, door frames and baseboards should be painted in a colour that contrasts with the colour of the wall. Glare from highly polished floors, metallic fixtures, and windows are poorly tolerated.

Furniture should be comfortable and designed for the musculoskeletal changes of older adults. Older adults should examine furniture carefully for size, comfort, and function before purchasing it. Furniture should be easy to get into and out of and should provide back support. Dining room chairs should be tested for comfort during meals and height in relation to the table. Older adults may prefer transferring out of a

wheelchair to another chair for meals because some styles of wheelchairs prevent sitting close enough to the table to eat comfortably. Raising the table to clear the wheelchair arms may bring the table closer to the adult but make it too high for comfortable use. To make getting out of bed easier and safer, the height of the bed should allow the adult's feet to be flat on the floor when the adult is sitting on the side of the bed.

The goal of nursing assessment of the environment is the promotion of independence and functional ability. Assessment of safety, a major component of an older adult's environment, includes determining risks within the environment and the adult's ability to recognize and respond to the risks (see Chapter 36). Risks include factors leading to injury within the home (such as water heaters set at excessively hot temperatures or throw rugs that could cause a fall) and factors outside of the home (such as deteriorating sidewalks and steps or a high incidence of street crime).

Death. Part of the life history of an older adult is the experience of the death of family members and friends (see Chapter 28). This experience includes the loss of the older generations of their families and sometimes the loss of a child or grandchild. As adults age, friends gradually die. The majority of older adults are faced with the death of a spouse. In 2001, 28% of all older women were widows, and 12.7% of older men were widowers (Statistics Canada, 2008). Some older adults must also cope with the death of children and grandchildren. All experience the deaths of friends. These deaths represent both losses and reminders of personal mortality. You should not, however, assume that older adults are comfortable with the idea of death. Coming to terms with death is often difficult. As a nurse, you will play a key role in assisting older adults through the grieving process.

Older people have a wide variety of attitudes and beliefs about death. To support a patient at the end of life, you can use the dignity-conserving model of care (Chochinov, 2007). In this model, you use your attitudes, behaviours, compassion, and dialogue acknowledging the individual's attitudes and beliefs about death to ensure his or her dignity at the end of life. Another model of care that you can use is a Living with Hope program (Duggleby et al., 2007) to foster his or her hope and improve quality of life. Such strategies to improve end-of-life care can be easily incorporated into everyday nursing practice. You will often be the adult to whom the patient and family members or friends turn for assistance in coping with death and loss. It is critical that you understand the grieving process, have excellent communication skills, understand the legal issues, are familiar with community resources, and are aware of your own feelings, limitations, and strengths as they relate to the care of patients confronting death.

Addressing the Health Concerns of Older Adults

The two most common causes of death in Canadian older adults are cancer and heart disease. Other frequently reported causes of death are respiratory diseases, stroke, accidents or falls, diabetes, kidney disease, and liver disease (Statistics Canada, 2008). For all these causes of death, preventive measures exist that could potentially reduce the frequency of these conditions and delay disability, death, or both.

You may participate in activities such as health screenings and health fairs, in which you can identify older adults at risk and advise them about disease prevention and health promotion measures. Many communities offer wellness programs

* BOX 24-7

FOCUS ON PRIMARY HEALTH CARE

Older Adult Wellness Programs

An important nursing intervention occurs when nurses focus on self-care abilities and practices that foster health during the aging process. Factors that have been reported to affect older adults' willingness to engage in health promotion activities include socioeconomic factors, beliefs and attitudes, encouragement by a health care provider, availability of access to resources, age, number of chronic illnesses, and mental and physical health (Resnick et al., 2008). In general, older adults seem to be less interested in engaging in health promotion activities for the purpose of lengthening their lives, but they may have greater interest in these activities if they improve quality of life (Resnick et al., 2008).

To help older adults maintain function and improve quality of life, the Saskatoon Health Region, in conjunction with several other community agencies, established an Older Adult Wellness Program. The program goals are as follows:

1. Encourage older adults to adopt lifestyle choices and practices that preserve their health.
2. Promote the concept of mutual aid and social support among older adults in the community (capacity building).
3. Alter or adapt social, economic, or physical surroundings to preserve and enhance the health of older adults.

The program is housed in a primary health centre. As part of this program, the nurses provide educational programs about promoting older adults' health to seniors living in the community, to health care providers, and to students enrolled in health care programs. The nurses collaborate with other community and regional health authority agencies to provide information and programs to increase physical activity, identify fall risks, and promote the prevention of falls. Preventive services such as health screening and immunizations are also offered to older adults. A directory of services and social activities for older adults has been published by the Saskatoon Council on Aging with assistance from Older Adult Wellness and the College of Kinesiology, University of Saskatchewan. This directory is used by older adults and the nurses to access services for program participants.

Source: Personal communication with Sarah Nixon-Jackle, RN, BScN, Public Health Nurse, Older Adult Wellness, Public Health Services, Saskatoon Health Region, March 14, 2011.



(Box 24-7) in which older adults can access information about health promotion and disease prevention. In acute care and long-term care settings, you must also assess the health status of older adults, intervene in acute situations, and, with the patients, plan strategies to reduce risk and manage chronic conditions. Each contact with an older adult, regardless of setting, offers opportunities to teach and counsel. To be most effective, use an individualized approach to health promotion activities with each patient (Resnick et al., 2008).

Nursing interventions for older adults are directed toward improving or maintaining their health needs and concerns. Although various interventions cross all three levels of care—health promotion, acute care, and restorative care—approaches to each level are unique. When you plan interventions, it is important to incorporate a patient's routines or rituals when possible because patients feel more secure when routines are continued. In general, the interventions are aimed at promoting independence and supporting self-care abilities.

Health Promotion and Maintenance: Physiological Health Concerns

Older adults, like adults of any age, vary in their desire to participate in health promotion activities; therefore, you should use an individualized approach, taking into account the adult's beliefs about the importance of staying healthy and fit and remaining independent. Researchers have not fully identified the factors that lead to good health in advanced age, but four factors seem to be important: genetics, chance, good health habits, and preventive measures. You cannot alter an older adult's genetic heritage or chance, but you can promote health habits by establishing health maintenance programs, and you can recommend preventive measures. Health maintenance programs have been found to have a positive impact on the physical, mental, and social health of older adults. Community centres, houses of worship, schools, shopping malls, libraries, and hospital lobbies can be used as settings to conduct screening tests and present information on health topics. Using creative approaches, you can include health promotion activities for older adults in all health care settings.

Approximately 80% of older adults living at home have at least one chronic health condition. The most common conditions are arthritis, high blood pressure, back problems, chronic heart problems, cataracts, and diabetes (Statistics Canada, 2008). The effect of chronic conditions on the lives of older adults varies widely, but, in general, chronic conditions diminish well-being and threaten independence. Nursing interventions are often directed at the management of these conditions, but interventions can also focus on prevention. You can recommend the following general preventive measures:

- Regular exercise
- Weight reduction if the older person is overweight
- Management of hypertension
- Smoking cessation
- Immunization for influenza, pneumococcal pneumonia, and tetanus

A Canadian study reported that as the numbers of adults receiving an influenza vaccination increased, hospitalizations decreased (Chen et al., 2010). Annual immunization against influenza is strongly recommended for all older adults, especially residents of long-term care facilities and persons of any age with chronic cardiovascular, pulmonary, and metabolic disorders. Vaccination against pneumococcal pneumonia is recommended for all adults older than 65 years. Influenza vaccine is needed every year, whereas pneumococcal pneumonia vaccine is given only once (although some authorities recommend revaccination six to eight years after the initial vaccination). For tetanus immunization, booster injections every ten years are recommended for adults who have received the primary series for tetanus immunization. However, not all older adults are up to date with their booster injections, and some have never received the primary series of injections. You should ask an older adult about the current status of all three types of immunizations, provide information about the immunizations, and make arrangements for the older person to receive the immunizations as needed. You should also refer older adults for screening for the early detection of cancer and depression.

Most older adults are interested in their health and are capable of taking charge of their lives. They want to remain independent and to prevent disability (see Figure 24-2). Initial screenings establish baseline data that can be used to determine wellness, identify health needs, and design health

maintenance programs. After initial screening sessions, you can share information on nutrition, exercise, medications, and safety precautions with older adults. You may also provide information about specific conditions, such as hypertension or arthritis, or about self-care procedures, such as foot and skin care. By providing information about health promotion and self-care, you can significantly improve the health and well-being of older adults.

Cancer. Malignant neoplasms are the most common cause of death among older adults (Statistics Canada, 2008). You may participate in programs to educate older adults about early detection, treatment, and risk factors. Examples include smoking cessation programs, teaching breast self-examination (see Chapter 4), and encouraging all older adults to have annual screening for fecal occult blood. It is also important to educate older adults about the signs of cancer and encourage prompt reporting of nonhealing skin lesions, unexpected bleeding, change in bowel habits, and unexplained weight loss. Detection is complicated when cancer symptoms are mistakenly identified by patients and health care providers as part of the normal aging process, and you must carefully distinguish between normal aging and pathological conditions.

Heart Disease. Heart disease is the second leading cause of death in older adults. Common cardiovascular disorders are hypertension and coronary artery disease. Hypertension is diagnosed when repeated diastolic blood pressure measurements are 90 mm Hg or greater and systolic measurements are 140 mm Hg or greater. Although over 45% of Canadians have elevated diastolic or systolic pressures or both (NACA, 2006), the fact that hypertension is common does not mean it is normal or harmless. Systolic pressures higher than 160 mm Hg are associated with increased risk of stroke, cardiovascular mortality, and overall mortality. In coronary artery disease, partial or complete blockage of one or more coronary arteries leads to myocardial ischemia and myocardial infarction. Risk factors for both hypertension and coronary artery disease include smoking, obesity, lack of exercise, and stress. Additional risk factors for coronary artery disease include hypertension, hyperlipidemia, and diabetes mellitus. Nursing interventions for hypertension and coronary artery disease address weight reduction, exercise, dietary changes to limit salt and fat, stress management, and smoking cessation. Patient education includes information about medications, blood pressure monitoring, nutrition, stress reduction techniques, and the symptoms that indicate the need for emergency care.

Smoking. Cigarette smoking has been recognized as the major preventable cause of death and disease in Canada (Canadian Council on Social Development for the Division of Aging and Seniors, Public Health Agency of Canada, 2004). Smoking cessation is a health promotion strategy as much for older adults as for younger adults. Older smokers can benefit from smoking cessation (Tait et al., 2007). In addition to reducing risk, smoking cessation may help stabilize existing conditions such as chronic obstructive pulmonary disease. Smoking cessation may even contribute to the extension of life or of independent functioning. There are many types of smoking cessation programs available to older adults, and you should provide information to the older adult about those programs.

Alcohol Abuse. It is estimated that up to 12% of older adults consume 14 or more drinks a week (Statistics Canada, 2008). Studies of alcohol abuse in older adults have revealed two patterns: a lifelong pattern of frequent heavy drinking and a late-onset pattern in which heavy drinking begins late in life.

Frequently cited causes of excessive alcohol use are depression, loneliness, and lack of social support.

Abuse of alcohol may be underidentified in older adults (Ebersole et al., 2008). Signs of alcohol abuse are subtle, and the assessment may be complicated by coexisting dementia or depression. Alcohol abuse should be suspected when the patient has a history of repeated falls and accidents, exhibits a change in behaviour or personality, is socially isolated, has recurring episodes of memory loss and confusion, has a history of skipping meals or medications, and has difficulty managing household tasks and finances. When abuse of alcohol is suspected, treatment includes age-specific approaches in which you acknowledge the stresses experienced by the patient and encourage involvement in activities that match the patient's interests and boost feelings of self-worth. The identification and treatment of coexisting depression is also important.

Nutrition. Lifelong eating habits and situational factors influence how older adults meet their needs for good nutrition. Lifelong eating habits based in tradition, ethnicity, and religion influence choices of what foods are eaten and how those foods are prepared. Situational factors affecting nutrition include availability of access to food stores, finances, the physical and cognitive capability for food preparation, and a place to store food and prepare meals. Undernutrition can be a significant deterrent to healthy aging (Furman, 2006).

Nutritional needs of older adults are affected by levels of activity and by clinical conditions. Level of activity has implications for the total amount of calories: more sedentary older adults usually need fewer calories than more active older adults. However, caloric requirements are not determined solely by activity. Additional calories may be required in clinical situations such as recovery from surgery, whereas calories may be restricted when the patient is diabetic or overweight. Beyond caloric requirements, therapeutic diets may restrict fat, sodium, or simple sugars or may increase fibre or foods with high levels of calcium, iron, vitamin A, or vitamin C.

Good nutrition for older adults includes appropriate caloric intake and limited intake of fat, salt, refined sugars, and alcohol. Although the nutritional guidelines displayed in Canada's Food Guide (Health Canada, 2007) are the basic recommendations for nutrition in older adults (see Chapter 42), some older adults do not follow these guidelines. Protein intake may be lower than recommended if patients have reduced financial resources or limited access to grocery stores. Difficulty chewing meat may also limit protein intake. Fat intake may be higher than recommended because fast-food restaurant meals may be substituted for meals prepared at home or because methods of cooking may feature fried foods and sauces made with butter and cream. Extra salt and sugar may be used in cooking or at the table to compensate for a diminished sense of taste. Vitamin intake may be reduced if the adult has difficulty shopping for fresh fruits and vegetables. As a nurse, you should assess the nutritional status of older adults in all settings and identify interventions to improve their nutritional status (Furman, 2006).

Older adults with dementia have special nutritional needs. As memory and functional skills decline, they lose the ability to remember when to eat, how to prepare food, and, eventually, how to feed themselves. At the same time, caloric needs may increase because of the energy expended in pacing and wandering activities. You and other caregivers of older adults with dementia should routinely monitor weight and food intake, serve food that is easy to eat, provide assistance with

eating, and offer food supplements as needed to maintain weight. Mealtime interventions for older adults with dementia provide opportunities for socialization and practice with functional skills.

Dental Problems. Dental problems are common in older adults and include conditions involving natural teeth and dentures. Dental caries, gingivitis, broken or missing teeth, and ill-fitting or missing dentures may affect nutritional adequacy, cause pain, and lead to infection. You can help prevent dental and gum disease through education about routine dental care (see Chapter 37). You can also help older adults find dental services that offer reduced rates and that are accessible to patients with impaired mobility.

Exercise. Older adults should be encouraged to maintain physical exercise and activity. The primary benefits of exercise include maintaining and strengthening functional ability and promoting a sense of enhanced well-being. Mobility is important to older adults for maintaining their physical and psychological health (Webber et al., 2010). An exercise such as walking builds endurance, increases muscle tone, improves joint flexibility, strengthens bones, reduces stress, and contributes to weight loss. Other benefits of an exercise program include improvement of cardiovascular function, improved plasma lipoprotein profiles, increased metabolic rate, increased gastrointestinal transit time, and improved quality of sleep. Frail older adults who exercise may experience improvements in mobility, gait, and balance, as well as less difficulty getting up from a chair or climbing stairs. Exercise also substantially delays the onset of functional impairment and loss of independence. As well, over half of nursing home residents with middle-stage dementia walking difficulties can be improved (Slaughter et al., 2011). You can help adults with dementia continue to be able to walk and exercise by creating supportive environments and making sure they get appropriate medications.

An exercise program should meet physical needs while allowing for physical impairments, and you should encourage the patient to persevere with the program. Willingness to participate in and persevere with an exercise program is influenced by general beliefs about exercise, specific benefits from exercise, past experiences with exercise, personal goals, personality, and any unpleasant sensations associated with exercise. Walking is the preferred exercise of many older adults (Figure 24-3). Walking and other low-impact exercises such as riding an exercise (stationary) bicycle or exercises in a swimming pool protect the musculoskeletal system and joints. Other exercises can be incorporated into an older adult's ADLs. For example, the adult can perform arm and leg circles while watching television. However, before beginning an exercise program, the older adult should have a physical examination. Exercise programs for sedentary older adults who have not been exercising regularly should begin conservatively and progress slowly. Safety considerations include wearing appropriate shoes and clothing, drinking water before and after exercising, avoiding outdoor exercise when the weather is very warm or very cold, and exercising with one or more partners. You should instruct the older adult to stop exercising and seek help if he or she experiences tightness or pain in the chest, shortness of breath, dizziness or lightheadedness, or palpitations during exercise.

Arthritis. Arthritis is common in older adults, especially women. The degree to which the mobility of older adults is impaired depends on the extent of disease and which joints are affected. Changes in joint range of motion and stability,



Figure 24-3 This couple enjoys walking together.

combined with the amount of pain experienced, affect quality of life. Arthritis has no cure, but pharmacological agents can decrease pain and swelling and therefore increase joint motion. Nursing interventions are aimed at promoting comfort, functional ability, and safety. Education on self-care techniques, joint protection, and exercises for flexibility and strength is also important.

Falls. Falls are a safety concern and one of the most common causes of functional dependence in seniors. Falls may lead to fear of additional falls, withdrawal from usual activities, and loss of independence (see Chapter 36). Hospitalization and placement in a long-term care facility may be required. Falls account for 87% of unintentional injuries that result in hospitalization for adults aged 71 years and older and for 75% of the deaths from injury in this age group (NACA, 2006). A fracture is sustained in 5% of falls in this age group. Falls are more frequent and have more serious consequences among adults older than 85 years.

Falls are caused by a combination of individual and environmental factors (RNAO, 2005a). Individual factors include impaired vision; cardiovascular conditions, such as postural hypotension or syncope; conditions affecting mobility, such as arthritis, muscle weakness, and foot problems; conditions affecting balance; alterations in bladder function, such as frequency or incontinence; cognitive impairment; and adverse medication reactions. Environmental factors include, but are not limited to, poor lighting, slippery or wet floors, stairs or sidewalks in poor repair, shoes in poor repair or with slippery soles, and household items that could be tripped over, such as throw rugs, foot stools, and electric extension cords. Multifactor falls-prevention programs such as “Stand-Up” have been found to significantly reduce falls in community-dwelling older people (Filiatrault et al., 2007). This program includes exercises to increase balance and strength, adoption of active lifestyles and safe behaviours, and actions to reduce hazards

in the home environment. You can encourage older adults to perform exercises aimed at increasing leg strength and balance, which also reduce the risk of falls. Simple interventions in the home, such as rearranging furniture to provide a clear pathway to the bathroom and providing a night light in the bathroom, can reduce falls related to nighttime trips to the toilet. Removing throw rugs and other items on the floor helps reduce slipping and tripping. You can also instruct older adults in the safe use of assistive devices such as canes, walkers, and wheelchairs. Older adults taking medications that may have adverse effects, such as postural hypotension, dizziness, or sedation, can be instructed to be aware of these potential effects and to take precautions such as changing position slowly or holding on to sturdy furniture if they are unsteady. Other health conditions such as ear infections can also contribute to falls.

Sensory Impairments. Most older adults have changes in vision, hearing, taste, and smell as a result of normal aging. Chapter 47 describes in detail the nursing interventions used to maintain and improve sensory function.

Pain. At least 50% of older adults suffer pain at any one time, and pain is undertreated (Hadjistavropoulos & Fine, 2006). Causes of pain in older adults include acute and chronic conditions (e.g., trauma, infection, neuropathies). Consequences of persistent pain include depression, sleep difficulties, changes in gait and mobility, and decreased socialization. Older adults are most at risk of having their pain inadequately assessed and treated (McAuliffe et al., 2009). Many factors influence the management of pain, including cultural influences on the meaning and expression of pain in older adults, fears related to the use of analgesic medications, and the problem of pain assessment with cognitively impaired older adults.

The Hartford Institute for Geriatric Nursing has several recommendations for assessing pain in older adults and have developed a pain management standard of practice protocol (Horgas & Yoon, 2011). You as a nurse should utilize these assessment tools and a variety of pharmacological and non-pharmacological interventions to manage older adults’ pain (Morone & Greco, 2007).

In caring for older adults you must advocate for appropriate and effective pain management and for the use of standardized pain tools in assessing pain (see Chapter 41). The goal of nursing management of pain in older adults is to maximize function and improve quality of life.

Medication Use. Older adults take more prescription and over-the-counter drugs than do people of any other age group. Older adults account for 12% of the population but use as much as 40% of prescription medications (NACA, 2006). In 2003, 92% of Canadian older adults reported using medications in the previous month (NACA, 2006). The medications most commonly used are cardiovascular drugs, antihypertensives, analgesics, sedatives, tranquilizers, laxatives, and antacids. **Polypharmacy** (the concurrent use of many medications) increases the risk for adverse reactions. Although polypharmacy may reflect inappropriate prescribing, the concurrent use of multiple medications may be necessary if the older adult has multiple acute and chronic conditions. However, a periodic and thorough review of all medications being used is important in helping older adults use the fewest necessary medications. Your role with an older adult undergoing drug therapy is to ensure the greatest therapeutic benefit with the least amount of harm. A good resource to help you is *Medication Matters* (Division of Aging and Seniors, Public Health Agency of Canada, 2008).

Older adults are at risk for adverse reactions because of age-related changes in the absorption, distribution, metabolism, and excretion of drugs (see Chapter 33). Medications may interact with one another; one drug may augment or negate the effect of another. Medications may also cause confusion; affect balance and mobility; cause dizziness, nausea, and vomiting; or lead to constipation, urinary frequency, or incontinence. Because of these effects, some older adults are unwilling to take medications, and others do not adhere to the prescribed dosing schedule.

Managing medications is a very important component of maintaining and promoting good health in old age. For some older adults taking large numbers of medications, safely managing medications can be a complex activity that can easily become overwhelming. You can provide valuable assistance to these older adults as they carry out this important self-care activity.

You should work collaboratively with an older adult to ensure safe and appropriate use of prescribed and over-the-counter medications. The older adult should be taught the names of all drugs being taken, when and how to take them, and the desirable and undesirable effects of the drugs. You should also teach how to avoid adverse effects and interactions of drugs and how to establish and follow an appropriate self-administration pattern. To reduce the risk for an adverse medication reaction, you should review the medications at each visit; examine for potential interactions with food or other drugs; simplify and individualize the drug regimen; take every opportunity to inform the older adult and family about all aspects of medication use; and encourage them to question the physician, advanced practice nurse, pharmacist, or all three about all prescribed and over-the-counter drugs.

When drugs are used in the management of confusion, special care is necessary. The sedatives and tranquilizers sometimes prescribed for acutely confused older adults may themselves cause or exacerbate confusion. These drugs should be carefully administered; age-related changes in body systems can affect the pharmacokinetic activity. When confusion has a physiological cause (such as an infection), the cause, rather than the confused behaviour, should be specifically treated. When confusion varies by time of day or is related to environmental factors, you can use creative, nonpharmacological measures such as changing the environment to include things that are familiar to the patient, providing adequate light, encouraging use of assistive devices (glasses, hearing aids), or even encouraging the older adult to make telephone calls to friends or family members to hear reassuring voices.

Health Promotion and Maintenance: Psychosocial Health Concerns

Interventions supporting psychosocial health of older adults resemble those for other age groups. However, some interventions are more crucial for older adults experiencing social isolation, cognitive impairment, or stresses related to retirement, relocation, or approaching death. These interventions include therapeutic communication, touch, cognitive stimulation, reminiscence, and measures to improve body image.

Therapeutic Communication. With therapeutic communication, you perceive and respect the older person's uniqueness and meet his or her expectations. Older adults expect you to be attentive, caring, and knowledgeable. Being attentive means providing care in a timely manner and meeting the older adult's expressed or unexpressed needs. As a caring nurse, you convey concern, kindness, and compassion. To

show that you are knowledgeable, you demonstrate procedural competence and are adept at recognizing needs and relaying information. Older adults also expect you to respect their individuality. When you meet expectations and communicate effectively, they accept you as someone who has a genuine concern for their welfare. However, you cannot simply enter an older adult's environment and immediately establish a therapeutic relationship; you must first be knowledgeable and skilled in communication techniques (see Chapter 17).

Touch. Throughout life, touch tells people about their environment and the people around them. Gentle touch conveys affection and friendliness. A firm hand clasp may convey security. Touch is a therapeutic tool that you can use to help comfort older adults. Hawranick et al. (2008) found that agitation levels of older adults with dementia were significantly lower when they received a touch intervention (Box 24-8). Touch can provide sensory stimulation, induce relaxation, provide physical and emotional comfort, orient the adult to reality, convey warmth, and communicate interest. It is a powerful physical expression of a relationship.

Older adults may be deprived of touching when separated from family or friends. An older adult who is isolated, dependent, or ill; fears death; or lacks self-esteem has a greater need for touch. You may recognize touch deprivation by behaviours as simple as an older person reaching for your hand or standing close to you. When you use touch, you must be aware of

* BOX 24-8

EVIDENCE-INFORMED PRACTICE GUIDELINE

Therapeutic Touch and Agitation in Individuals with Alzheimer's Disease

Evidence Summary

Very few strategies to alleviate or treat disruptive behaviour are effective in people with Alzheimer's disease. The purpose of a 2008 study by Hawranick et al. was to compare the effectiveness of therapeutic touch (identifying and correcting energy imbalances by passing hands several inches above the patient's body), simulated therapeutic touch (moving hands over the patient's body without energy transfer), and usual care on the disruptive behaviour of 51 subjects with Alzheimer's disease who were receiving long-term care. Disruptive behaviour was classified into three categories: physical aggression, physical nonaggression, and verbal agitation. Physical nonaggressive behaviours decreased significantly in subjects who received therapeutic touch, in comparison with those who received the simulated version and usual care. All categories of disruptive behaviours decreased over time in both the subjects receiving therapeutic touch and those receiving simulated therapeutic touch.

Application to Nursing Practice

- Therapeutic touch and simulated therapeutic touch are effective in reducing disruptive behaviours in patients with Alzheimer's disease.
- These touch techniques can be taught to family members, staff, and volunteers.
- These techniques can help calm the agitated adult and enhance communication during visits.

Based on Hawranick, P., Johnston, P., & Deatrich, J. (2008). Therapeutic touch and agitation in individuals with Alzheimer's disease. *Western Journal of Nursing Research*, 30(4), 417-434.



cultural variations and individual preferences (see Chapter 9). Touch should convey respect and sensitivity; it should not be used in a condescending way, such as patting an older adult on the head.

Cognitive Simulation. Cognitive stimulation, in which adults engage in cognitive activities such as games, appears to show promise in improving cognitive function in adults with moderate to severe dementia (Knowles, 2010). It is considered more effective and less confrontational than reality orientation techniques, although it does include some aspects of reality orientation. An example of cognitive stimulation is the use of a reality orientation board with personal and orientation information combined with sessions of cognitive exercises involving memory, problem solving, and conversation (Knowles, 2010). Some older adults may benefit more from cognitive stimulation than do others, but this still remains unknown. Until more information is available, you should be sensitive to individuals' responses. You should always be respectful, patient, and calm, and in communicating, you should answer questions simply, honestly, and with sensitivity.

Reminiscence. Reminiscence is recalling the past. Many older adults find enjoyment in sharing past experiences. In reminiscence as therapy, the recollection of the past is used to find meaning and understanding of the present and to resolve current conflicts. Remembering positive resolutions to problems reminds older adults of previous coping strategies used successfully. Reminiscing is also a way to express personal identity. Reflection on past achievements supports self-esteem. For some older adults, the process of remembering past events uncovers new meanings for those events and fosters hope (Duggleby & Wright, 2005). Short term life-review interviews have been found to increase hope and spiritual well-being in terminally ill patients (Ando et al., 2010).

During the assessment process, you may use reminiscence to assess self-esteem, cognitive function, emotional stability, unresolved conflicts, coping ability, and expectations for the future. Reminiscence also occurs during direct care activities. Taking time to ask the patient questions about his or her experiences and listening attentively conveys to an older adult your attitude of respect and concern.

Although reminiscence is often useful in a one-on-one situation with older adults, reminiscence can also be useful in group therapy for cognitively impaired or depressed older adults. You can organize the group and select strategies to start a conversation (e.g., ask the group to discuss families or childhood memories). The group's size, structure, process, goals, and activities are adapted to meet its members' needs.

Body-Image Interventions. The way that older adults present themselves influences body image and feelings of isolation. Some physical characteristics of older adulthood, such as distinguished-looking grey hair, may be socially desirable. Other features, such as a lined face that displays character or wrinkled hands that convey a lifetime of hard work, may also be impressive. Consequences of illness and aging that threaten the older adult's body image include invasive diagnostic procedures, pain, surgery, loss of sensation in a body part, skin changes, loss of scalp hair, and incontinence. Body image is also affected by the use of devices such as dentures, hearing aids, artificial limbs, indwelling catheters, ostomy devices, and enteral feeding tubes.

The importance to the older adult of presenting a socially acceptable image must be considered. When older adults have acute or chronic illnesses, the related physical dependence

makes it difficult for them to maintain body image. You can influence the older adult's appearance by assisting with grooming and hygiene, such as combing hair, cleaning dentures, shaving, or changing clothing. You should also be sensitive to odours in the environment. Odours may be created by urine and some illnesses. By controlling odours, you may encourage visitors to stay longer or visit more often.

Older Adults and the Acute Care Setting

Older adults in the acute care setting need special attention to help them adjust to the acute care environment and to meet their basic needs for comfort, safety, nutrition, hydration, and skin integrity. The acute care setting poses increased risk for adverse events such as delirium, dehydration, malnutrition, nosocomial infections, urinary incontinence, and falls.

The risk for delirium is increased when hospitalized older adults experience immobilization, infection, dehydration, pain, and hypoxia. Multiple medications and multiple medical diagnoses are also risk factors. Nonmedical causes include placement in unfamiliar surroundings, separation from supportive family members, and stress. Impaired vision or hearing contributes to confusion and interferes with nurses' attempts to reorient the patient. When prevention of delirium fails, the basis of nursing management is identification and treatment of the cause of delirium. Supportive interventions include encouraging family visits, providing memory cues (e.g., clocks, calendars, name tags), and compensating for sensory deficits. Reality orientation techniques may be useful.

Older adults are at greater risk for dehydration and malnutrition during hospitalization because of standard procedures such as limiting food and fluids in preparation for diagnostic tests. The risk for dehydration and malnutrition is also increased when older adults are unable to reach beverages or to feed themselves while in bed or connected to medical equipment. Interventions include getting the patient out of bed, providing beverages and snacks frequently, and including favourite foods and beverages in the diet plan.

The risk for nosocomial infections in older adults is increased by age-related reductions in immune system response. Of all health care agency-acquired infections, 65% occur in hospitalized patients older than 60 years: urinary catheter-related bacteriuria in older adults is the most common infection (Touhy et al., 2012). Other nosocomial infections include surgical site infection, pneumonia, and blood stream infections. Prevention begins with hand hygiene and measures to minimize the risk of infection from procedures (see Chapter 32). Prevention also includes measures to increase the older adult's resistance to infection.

Older adults in acute care settings are also at risk for acquiring urinary incontinence (transient incontinence). Causes of transient urinary incontinence include delirium, untreated urinary tract infection, excessive urine production, medications, restricted mobility, and constipation or impaction. Interventions for transient urinary incontinence should be geared to correcting contributing factors. The interventions may include an individualized plan to provide voiding opportunities and modification of the environment to improve access to the toilet. Indwelling urinary catheters should be avoided if possible. Skin breakdown should be prevented.

The risk for skin breakdown and the development of pressure ulcers is increased by changes in aging skin and situations that arise in the acute care setting, such as immobility,

incontinence, and malnutrition. To prevent skin breakdown in older patients, you must avoid pressure on the skin, reduce shear forces and friction, provide skin care and moisture management, and provide nutritional support (see Chapter 42).

Older adults in the acute care setting are at risk for falling and sustaining injuries. Many of the falls occur as they get out of bed without assistance. Sedating medications may increase unsteadiness. Medications causing orthostatic hypotension may also increase the risk for falls because the blood pressure drops when the patient arises from a bed or chair. Diuretics increase the risk for falling because the adult must get out of bed often to void. Attempts to get out of bed when physically restrained may lead to injury if the patient becomes entangled in the restraint. Equipment such as wires from monitors, intravenous tubing, urinary catheters, and other medical devices become obstacles to safe ambulation. Impaired vision may prevent the patient from seeing tripping hazards such as garbage cans. Confused older adults, who may try to get out of bed although weak, unsteady, or drowsy, may benefit from the presence of family members and friends. Interventions to reduce the risk for falling include assistance with ambulation, strengthening exercises, medication monitoring, assistance with toileting, and removal of tripping hazards (see Chapter 36). Falls may be reduced by minimizing fall risk factors; through staff, patient, and family education; and through individualized fall-reduction interventions. The goal is to minimize the risk of falling without compromising mobility and functional independence.

Using the RNAO (2005a) best practice guidelines as a basis for falls prevention, a hospital in Ontario implemented a falls prevention strategy (Ireland et al., 2010) (Box 24-9).

Older Adults and Restorative Care

Restorative care consists of two types of ongoing care: (1) continuing the convalescence from acute illness or surgery that began in the acute care setting and (2) addressing chronic conditions that affect day-to-day functioning. Both types of care take place in private homes and long-term care settings.

Interventions during convalescence from acute illness or surgery are directed toward regaining or improving the prior level of independence in ADLs. Interventions that began in the acute care setting should be continued and later modified as convalescence progresses. To achieve this continuation, the acute care setting's discharge information should describe the ongoing interventions (e.g., exercise routines, wound care routines, medication schedules, vital sign monitoring, and blood glucose monitoring). To ensure that all the patient's needs are addressed, a team approach to discharge planning is important. Interventions should also address the restoration of interpersonal relationships and activities either at their previous level or at the level desired by the patient.

When restorative care addresses chronic conditions, the goals of care include stabilizing the chronic condition, promoting health, and promoting independence in ADLs. Interventions to stabilize the chronic condition may focus on regulation or prevention. An example of a regulatory intervention is the monitoring of blood glucose levels in diabetes. An example of promoting health is a smoking cessation program for the older adults with chronic obstructive pulmonary disease.

Health promotion interventions for older adults, as addressed in this chapter, should occur in all health care settings. For example, nurse-directed programs in long-term care settings improve ambulation, reverse urinary incontinence, and reduce confusion.

Interventions to promote independence in ADLs address physical ability, cognitive ability, and safety. The physical ability to perform ADLs requires strength, flexibility, and balance. Impairments of vision, hearing, and touch must be accommodated. The cognitive ability to perform ADLs requires the ability to recognize, judge, and remember. Cognitive impairments, such as Alzheimer's disease, may interfere with the safe performance of ADLs, although the affected patient is still physically capable of the activities. Interventions to promote independence in ADLs adapt these requirements to the needs and lifestyle of the older adult. Safety is always an important consideration. An older adult should be able to perform the ADLs with the least amount of risk.

Beyond the basic ADLs, the older adult's ability to perform instrumental ADLs must be assessed and appropriate interventions implemented. Instrumental ADLs are tasks such as using a telephone, preparing meals, shopping, doing laundry, cleaning the home, and driving an automobile. To remain independent at home or in assisted-living residences, older adults must be able to perform instrumental ADLs, be able to purchase services by outside workers, or have a supportive network of family and friends who assist with these tasks.

Restorative care measures focus on activities to prevent, improve, reduce, or eliminate problems. Priorities of care are established, patient goals and expected outcomes are determined, and appropriate interventions are selected. These are done with the patient's participation so that interventions are understood and conflicts in approaches or priorities can be avoided. An older adult's lifetime experiences, values, and sociocultural background are the bases for planning individual care. When deterioration of the patient's cognitive status prevents participation in care decisions, family or significant others must be consulted. Family and friends are rich sources of data because they knew the patient before the impairment. Frequently they can provide explanations for the older adult's behaviours and suggest methods of management. Thoughtful assessment and planning involve consideration of

BOX 24-9 RESEARCH HIGHLIGHT

Designing a Fall-Prevention Strategy That Works

Evidence Summary

A falls prevention strategy based on the RNAO (2005a) Best Practice Guidelines was implemented on 60 clinical units in an Ontario hospital. The strategy included a basic approach to falls risk assessment and a falls prevention education program for staff. At the end of the first year of implementation, 92% of staff had received the education. Compared to the previous year, there was a 20% reduction in falls hospital-wide.

Application to Nursing Practice

- The number of falls in a hospital can be reduced through implementation of a falls prevention strategy.
- Falls risk assessment is an important part of the strategy.
- Education of staff is an important part as well.

Reference: Ireland, S., Lazar, T., Mavark, C., Morgan, B., Pizzacalla, A., Reis, C., & Fram, N. (2010). Designing a falls prevention strategy that works. *Journal of Nursing Care Quality*, 25(3), 198–207.



the influence of normal aging changes, facilitate an optimal level of comfort and coping, and promote independence in self-care activities.

✦ KEY CONCEPTS

- The number of older adults, especially the number of older adults older than 85 years, is increasing.
- Because your attitudes toward older adults influence the quality of care, those attitudes should be based on accurate information about older adults, rather than on myths and stereotypes.
- Biological and psychosocial theories of aging offer possible explanations for the changes seen in aging, but every older adult is a unique individual who ages in a unique way.
- The physical changes that accompany aging are considered normal, not pathological, although they may predispose the older adults to disease.
- Cognitive impairment is not normal in older adults, and necessitates assessment and intervention.
- Cognitive impairment includes acute, potentially reversible disorders and chronic, irreversible, progressive disorders.
- Areas affected by psychosocial changes of aging include retirement, social isolation, change in housing, death, and sexuality.
- Nursing interventions for psychosocial concerns include therapeutic communication, touch, cognitive stimulation, reminiscence, and interventions to improve body image.
- The leading causes of death in the older population are cancer, heart disease, stroke, lung disease, accidents and falls, diabetes, kidney disease, and liver disease.
- Health promotion recommendations for older adults include good nutrition, regular exercise, smoking cessation, measures to reduce the risk for falls, and measures to reduce adverse medication reactions.
- Acute care settings increase older adults' risk for delirium, dehydration, malnutrition, nosocomial infections, urinary incontinence, and falls.
- Restorative nursing interventions, whether accomplished in the older adult's home or in long-term care institutions, stabilize chronic conditions, promote health, and promote independence in basic and instrumental ADLs.

✦ CRITICAL THINKING EXERCISES

1. Mr. Brown, 73 years old, has come to the clinic for a routine check of his blood pressure. It is normal (130/80 mm Hg). He says that he wants to do everything he can to stay healthy. What advice can you give on health promotion and disease prevention?
2. Mrs. Shephard's daughter has come with her to the clinic. She is concerned about her mother's memory. She tells you that her mother's memory has been excellent but has suddenly become poor. Two days ago, Mrs. Shephard phoned her daughter six times in two hours, asking where her husband (the late Mr. Shephard) was, and, when told of his death four years ago, Mrs. Shephard denied this fact. When her daughter arrived at her house to check on her, she found that Mrs. Shephard had emptied the contents of all the closets onto the floor and accused her daughter of theft. Her daughter brought Mrs. Shephard to her own home that night because of concern about Mrs. Shephard's safety. From the daughter's report, you suspect delirium (acute confusional state). What questions should you ask, and what areas should you assess to identify the possible causes of Mrs. Shephard's confusion?

3. A nursing colleague tells you that she does not know very much about assessing older adults, and she asks for some pointers on how to perform a thorough assessment. What advice can you give her about the process of geriatric assessment?

✦ REVIEW QUESTIONS

1. Two factors contribute to the projected increase in the number of older adults:
 1. Financial success and improved environment
 2. Fewer medical problems associated with aging
 3. Improved medication plan and increase in federal health care funding
 4. The aging of the "baby-boom" generation and the growth of the population segment older than 85 years
2. Which of the following is true about the theories of aging?
 1. Genetic changes are solely responsible.
 2. Environment is the main factor.
 3. No single theory explains aging.
 4. Disease causes a decline in function.
3. The three common conditions affecting cognition in older adults are
 1. Stroke, heart attack, and cancer of the brain
 2. Cancer, Alzheimer's disease, and stroke
 3. Delirium, depression, and dementia
 4. Blindness, hearing loss, and stroke
4. Sexuality is recognized as a factor in the lives of older adults; thus,
 1. Any expression of sexuality should be discouraged
 2. All older adults, whether healthy or frail, need to express sexual feelings
 3. An older adult's need for sexual expression decreases
 4. The need to touch and be touched is decreased
5. The libido does not decrease in older adults; however,
 1. Frequency of sexual activity may decline
 2. Physical changes do not usually affect sexual functioning
 3. The need to touch and be touched is decreased
 4. The sexual preferences of older adults are not as diverse
6. Visual acuity declines with age. Presbyopia is a progressive decline in
 1. Distinguishing between blues and greens and among pastel shades
 2. The ability to see in darkness
 3. The ability to focus on near objects
 4. Adaptation to abrupt changes from darkness to light
7. A common age-related change in auditory acuity is called
 1. Presbycusis
 2. Presbyopia
 3. Calcification
 4. Hypertrophy
8. Taste buds atrophy and lose sensitivity. Older adults are less able to discern
 1. Salty, sweet, sour, and bitter tastes
 2. Hot and cold temperatures
 3. Moistness and dryness
 4. Spicy and bland tastes

9. Changes in the musculoskeletal system lead to changes in the configuration of the thorax. This is known as
 1. Hypertrophy
 2. Calcification
 3. Presbycusis
 4. Kyphosis
10. Frontotemporal dementia has an insidious onset and progresses slowly. Early symptoms include
 1. Poor hygiene, lack of social tact, and sexual disinhibition
 2. More involvement in surroundings and social situations
 3. Fluctuating cognition and visual or auditory hallucinations (or both)
 4. Motor features of Parkinsonism

✦ RECOMMENDED WEB SITES

Alzheimer Society of Canada: <http://www.alzheimer.ca>

The Alzheimer Society of Canada provides current information about Alzheimer's disease, related dementias, caregiving, support, research, treatment, and programs and services.

Canadian Gerontological Nursing Association: <http://www.cgna.net>

This Web site provides information about gerontological nursing practice in Canada, including current standards of practice.

Public Health Agency of Canada, Division of Aging and Seniors: <http://www.phac-aspc.gc.ca/seniors-aines/>

This federal Web site provides links to new services, publications, and news releases on issues relevant to aging.

Hartford Institute for Geriatric Nursing. ConsultGerIRN.org: http://consultgerirn.org/resources/geriatric_topics/

This Web site provides continually updated evidence-informed protocols and assessment tools for nurses to use with older adults.

Review Question Answers

1. 4; 2. 3; 3. 3; 4. 2; 5. 1; 6. 3; 7. 1; 8. 1; 9. 4; 10. 1

Rationales for the Review Questions appear at the end of the book.

Self-Concept

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objectives

Mastery of content in this chapter will enable you to:

- Define the key terms listed.
- Discuss factors that influence the following components of self-concept: identity, body image, and role performance.
- Identify stressors that affect self-concept and self-esteem.
- Describe the components of self-concept as related to psychosocial and cognitive developmental stages.
- Explore ways in which a nurse's self-concept and nursing actions can affect a client's self-concept and self-esteem.
- Incorporate research findings to promote evidence-informed practice for identity confusion, disturbed body image, low self-esteem, and role conflict.
- Examine cultural considerations that affect self-concept.
- Apply the nursing process to promote a client's self-concept.

key terms

Body image, p. 399	Role performance, p. 399
Identity, p. 398	Role strain, p. 403
Identity confusion, p. 402	Self-concept, p. 396
Role ambiguity, p. 403	Self-esteem, p. 400
Role conflict, p. 403	Sick role, p. 403
Role overload, p. 403	

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Self-concept is the mental image that one has of oneself. It is a composite of ideas, feelings, and attitudes that a person has about his or her own identity, worth, strengths, and limitations. Self-concept comprises several domains: social, emotional, physical, and academic. Self-concept affects how a person adapts to challenges, difficult situations, and relationships. Individuals with a positive self-concept are better able to cope with illness and stressful life circumstances and events. They are also more likely to choose healthy behaviours and participate in activities to promote their health and prevent illness.

Nurses care for clients with a variety of health problems that can threaten their self-concept. The loss of a bodily function, a decline in activity tolerance, and difficulty managing a chronic illness are all situations that can potentially affect a client's self-concept. Nurses need to assess clients to determine if they have a healthy self-concept and to develop nursing strategies to meet client's needs. Nurses play a key role in helping clients adjust to alterations in self-concept and in supporting components of self-concept that enable clients to cope with difficulties.



Figure 25-1 Participating in group activities can foster adolescents' self-esteem. **Source:** From Birchenall, J., & Streight, E. (2003). *Mosby's textbook for the home care aide* (2nd ed.). St. Louis, MO: Mosby.

Scientific Knowledge Base

The development of self-concept begins in early childhood and continues across the lifespan. Parents and other family members, as well as relationships with others, influence the development of a child's self-concept. Other factors that influence the development of self-concept are the child's gender, developmental stage, socioeconomic status, culture, and environment. In general, young children tend to rate themselves higher on measures of self-concept than they rate other children, which is perhaps a reflection of their egocentric view of the world. Self-concept becomes more clearly differentiated during the transition into puberty and during adolescence. Adolescence is a particularly critical time, when many factors affect self-concept (Figure 25-1). The adolescent experience appears to adversely affect girls more than boys (Birndorf et al., 2005). For girls, adolescence brings menarche, its associated symptoms, the development of breasts, and a gain in body fat. As a result, adolescent girls may be more sensitive to their appearance and how others view them. For boys, there are no sudden physical changes to indicate puberty. Maturational changes are generally regarded as more positive (Park, 2003).

In adulthood, men tend to report higher levels of self-esteem than do women. However, the exact magnitude of this gender difference and the way it varies across the lifespan remain unclear. Job satisfaction and job performance are linked to self-esteem. When individuals lose a job, they lose their position-related identity, and their self-perceptions may be altered or diminished. They may not be motivated to be active socially or may even become depressed. Underemployment also can affect role identity and self-esteem (McKee-Ryan, 2011). A developmental goal of adulthood is to establish a sense of self that is stable and transcends relationships and situations.

In older adults, the sense of self may be negatively affected by emotional and physical changes associated with aging (Robins et al., 2002). When older adults lose a partner or develop health problems, for example, they may experience negative changes in independence or social interaction. These changes may alter their self-concept and self-esteem.

Ethnic and cultural differences in self-concept and self-esteem have also been demonstrated across the lifespan, and research findings suggest that differences in the development

of self-concept may exist (Twenge & Crocker, 2002). To ensure an individualized approach to nursing care, nurses must be sensitive to factors that affect self-concept and self-esteem in diverse cultures.

Individuals' perceptions of themselves and of their health are closely related. Clients' beliefs about their personal health can enhance their self-concept. Statements such as "I can get through anything" or "I've never been sick a day in my life" indicate that a person's thoughts about personal health are positive. Self-concept is also affected by illness, hospitalization, and surgery. Chronic illness may affect the ability to provide financial support, thereby affecting an individual's self-esteem and perceived roles within the family. Negative perceptions regarding health status may be reflected in such statements as "It's not worth it anymore" or "I'm a burden to my family." Chronic illness can affect identity and body image. This is reflected in statements such as "I'll never get any better" or "I can't stand to look at my body this way."

What individuals think and how they feel about themselves affect the way they care for themselves physically and emotionally and the way they care for others. How a person behaves is generally consistent with both self-concept and self-esteem. Individuals who have poor self-concepts often do not feel in control of situations and may not feel worthy of care, which can influence decisions regarding health care. Knowledge of variables that affect self-concept is crucial for providing effective treatment.

Nursing Knowledge Base

Knowledge developed from medical and social sciences, humanities, and psychology, as well as knowledge from nursing research and clinical practice, is used to provide clients with evidence-informed practice. This broad knowledge base allows nurses to have a holistic view of clients, which promotes quality client care that best meets the self-concept needs of each client.

Development of Self-Concept

Individuals are not born with a self-concept. Rather, self-concept develops throughout the life span. In the 1960s, Erik Erikson (1963) introduced his theory of psychosocial development. Erikson hypothesized that individuals must negotiate eight stages as they progress through the lifespan. At each stage, individuals faced key tasks that they must master. Each stage builds on the tasks of the previous stage, and successful mastery of each stage leads to a positive sense of self (Box 25-1).

Most individuals master each stage; however, individuals can regress during times of major stress or illness. Nurses learn to recognize an individual's failure to achieve an age-appropriate developmental stage or an individual's regression to an earlier stage in a period of crisis. This understanding enables nurses to individualize care and determine appropriate nursing interventions. Self-concept is always changing and is based on the following:

- Sense of competency and mastery of prior and new experiences
- Perceived reactions of other people to own body
- Ongoing perceptions and interpretations of other people's thoughts and feelings
- Personal and professional relationships
- Collective beliefs and images one holds about oneself
- Academic and employment-related identity

► BOX 25-1

Self-Concept: Erikson's Developmental Tasks**Trust Versus Mistrust (Birth to Age 1 Year)**

Develops trust from consistency in caregiving and nurturing interactions of parents and others
Distinguishes self from environment

Autonomy Versus Shame and Doubt (Ages 1 to 3 Years)

Begins to communicate likes and dislikes
Is increasingly autonomous in thoughts and actions
Appreciates body appearance and function
Develops self through modelling, imitation, and socialization

Initiative Versus Guilt (Ages 3 to 6 Years)

Takes initiative
Identifies with a gender
Gains enhanced self-awareness
Increases language skills, including identification of feelings
Is sensitive to family feedback

Industry Versus Inferiority (Ages 6 to 12 Years)

Incorporates feedback from peers and teachers
Increases self-esteem with new skill mastery (e.g., reading, math, sports, music)
Experiences strengthening of sexual identity
Is aware of strengths and limitations

Identity Versus Role Confusion (Ages 12 to 20 Years)

Accepts body changes and maturation
Examines attitudes, values, and beliefs; establishes goals for the future
Feels positive about expanded sense of self
Interacts with people whom he or she finds sexually attractive or intellectually stimulating

Intimacy Versus Isolation (Ages Mid-20s to Mid-40s)

Has intimate relationships with family and significant others
Has stable, positive feelings about self
Experiences successful role transitions and increased responsibilities

Generativity Versus Self-Absorption (Ages Mid-40s to Mid-60s)

Accepts changes in appearance and physical endurance
Reassesses life goals
Shows contentment with aging

Ego Integrity Versus Despair (Ages Late 60s and Older)

Feels positive about own life and its meaning
Is interested in providing a legacy for the next generation

Components and Interrelated Terms of Self-Concept

A positive self-concept provides a sense of meaning, wholeness, and clarity. A healthy self-concept has a high degree of stability, generates positive feelings toward the self, and helps individuals adapt positively to stressors. There are many components of self-concept. Those particularly relevant to nurses are identity, body image, and role performance. Self-esteem is a closely related concept. The terms *self-concept* and *self-esteem* are often used interchangeably, but there is a distinction. Self-esteem stems from self-concept, and self-esteem influences self-concept. *Self-concept* is a descriptive term, whereas *self-esteem* is an evaluative term. In other words, identity asks the question "Who am I?" whereas esteem really focuses on "Am I worthy?" Nurses facilitate communication and ensure that the nursing care plan is individualized to meet each client's needs when these terms are used appropriately.

Identity. Identity involves the internal sense of individuality, wholeness, and consistency of a person over time and in various circumstances. Identity distinguishes us from others. Identity is influenced by age, gender, social class, ethnicity, and culture. Establishing an individual identity is an important developmental task from childhood to adolescence to young adulthood. Identity develops over time and ends in being a "unique person." A child learns culturally and socially accepted values, behaviours, and roles through observing other people and modelling their behaviour. Identity is often gained from self-observation and from what individuals are told about themselves (Stuart & Laraia, 2005). A child first identifies with parental figures and later with teachers, peers, and role models. To form an identity, a child must be able to integrate learned behaviours and expectations into a coherent, consistent, and unique whole (Erikson, 1963).

Sexuality is a part of one's identity. Gender identity is a person's sense of self as a man or as a woman and includes a person's sexual orientation. This image and its meaning depend on culturally determined values that are affected by socialization (see Chapter 22).

Religious faith also may foster identity formation through participation in traditions and rituals (Good & Willoughby, 2007; Sinclair & Milner, 2005; Smith, 2003a, 2003b). Associating with others in a religious community provides strong identity experiences that influence an individual's sense of self.

Racial or cultural identity develops from identification and socialization within an established group, as well as through the experience of integrating the response of individuals outside the cultural or racial group into a person's sense of self. Differences in ethnic identity (e.g., Vietnamese Canadian, Polish Canadian) exist through participation in traditions, customs, and rituals. The evolution of cultural identity may be challenging for some individuals. For example, the children of Chinese immigrants who are born in Canada may experience two different environments on a daily basis—a traditional Chinese home and a largely Caucasian school environment. First Nations peoples recognize the pivotal role of personal and cultural identity and have engaged in strategies to reclaim their culture by revitalizing their language and traditional practices (Usborne & Taylor, 2010, p. 895). A strong cultural identity generally is positively related to self-concept, self-esteem, and psychological health and well-being (Twenge & Crocker, 2002; Usborne & Taylor, 2010). Cultural differences in self-concept exist and may also demonstrate some age-specific trends (Box 25-2).

- Racial and ethnic identity
- Sexual identity
- Personality structure
- Perceptions of events that have an impact on the self
- Personal appearance and physical attractiveness
- Current feelings about the physical, emotional, and social self
- Self-expectations

* BOX 25-2 CULTURAL ASPECTS OF CARE

Racial and Cultural Background

Racial and cultural identity are important components of a person's self-concept. Early in growth and development, an individual develops a racial and cultural identity within the family context. As the individual grows, the cultural aspects of their self-concept may be reinforced through family, social, or cultural experiences. An individual's self-concept may be strengthened or challenged through political, social, or cultural influences experienced in school or work environments. Positive or negative cultural role modelling and past experiences also influence self-concept.

Implications for Practice

- To improve a client's self-concept, develop an open, nonrestrictive attitude when assessing for and encouraging cultural practices.
- Ask clients what they think is important to help them feel better or gain a stronger sense of self.
- Encourage cultural identity by individualizing hygiene practices, dietary choices, and clothing to meet each client's self-concept needs.

Data from Birndorf, S., Ryan, S., Auinger, P., & Aten, M. (2005). High self-esteem among adolescents: Longitudinal trends, sex differences, and protective factors. *Journal of Adolescent Health*, 37, 194–201; Biro, F. M., Streigel-Moore, R. H., Franco, D. L., Padgett, J., & Bean, J. A. (2006). Self-esteem in adolescent females. *Journal of Adolescent Health*, 39, 501–507; Robins, R. W., Trzesniewski, K. H., Tracy, J. L., Gosling, S. D., & Potter, J. (2002). Global self-esteem across the life span. *Psychology and Aging*, 17(3), 423; Twenge, J. M., & Crocker, J. (2002). Race and self-esteem: Meta-analyses comparing Whites, Blacks, Hispanics, Asians, and American Indians. *Psychology Bulletin*, 128(3), 371–408; and Osborne, E., & Taylor, D. M. (2010). The role of cultural identity clarity for self-concept clarity, self-esteem, and subjective well-being. *Personality and Social Psychology Bulletin*, 36(7), 883–897.

Body Image. Body image involves attitudes related to the body, including physical appearance, structure, or function. Feelings about body image include those related to femininity and masculinity, youthfulness, sexuality, health, and vitality. These mental images are not always consistent with a person's actual physical structure or appearance. Some body image distortions have deep psychological origins, such as those that occur in an eating disorder (e.g., anorexia nervosa). Other alterations occur as a result of situational events such as an amputation of a limb as a result of trauma or a scar due to surgery.

The majority of men and women experience some degree of body dissatisfaction, which can affect body image and overall self-concept. Disturbances in body image can be exaggerated when a change in health status occurs. The way other people view a person's body and the feedback offered are also influential. For example, a controlling, violent husband might tell his wife that she is ugly and that no one else would want her. Over time, with repeated humiliation and degradation, she may incorporate this devalued image into her self-concept.

Body image is affected by cognitive growth and physical development. Normal developmental transitions such as puberty or menopause can affect body image. Body image is influenced by hormonal changes during adolescence. The development of secondary sex characteristics and changes in body fat distribution affect an adolescent's self-concept. In the



Figure 25-2 An individual's appearance influences self-concept.
Source: From Sorrentino, S. A. (2008). *Mosby's textbook for nursing assistants* (7th ed., p. 120, Fig. 9-18). St Louis, MO: Mosby.

older adult, changes associated with aging (e.g., decreasing visual acuity and hearing) can affect body image.

Cultural and societal attitudes and values also influence body image. Culture and society dictate accepted norms for body image that can influence a person's attitudes (Figure 25-2). Values such as ideal body weight and shape, as well as attitudes toward body markings, piercing, and tattoos, are culturally based. In North American culture, people have been socialized to dread the aging process. Youth, beauty, and vitality are emphasized, as is apparent in television programs, movies, and advertisements. The media play an important role in creating and perpetuating unrealistic standards of thinness, youth, and physical attractiveness that is difficult or impossible for individuals to attain (Strahan et al., 2008). The media even influence women's eating behaviours (Strahan et al., 2007). Exposure to societal messages that reflect the sociocultural norm have a negative impact on women. Men also have been shown to be negatively affected by idealized media images (Strahan et al., 2006).

Body image depends only partly on reality. When physical changes occur, individuals may or may not incorporate these changes into their body image. For example, people who have experienced significant weight loss may not perceive themselves as thin and thus may have a distorted body image. Body image issues are often associated with impaired self-concept and self-esteem.

Role Performance. Role performance is the way in which individuals perceive their ability to carry out significant roles. Common roles include parent, child, spouse, employee, and student. Some roles are assumed for a limited amount of time (e.g., student or client role). An individual's perception of competency in a role may or may not match other people's evaluation. Roles that individuals follow in given situations involve socialization to expectations or standards of behaviour. Individuals learn behaviours that are approved by society through the following processes:

- **Reinforcement-extinction:** Certain behaviours become common or are avoided, depending on whether they are approved and reinforced or are discouraged and punished.
- **Inhibition:** An individual learns to refrain from certain behaviours, even when tempted to engage in them.
- **Substitution:** An individual replaces one behaviour with another, which provides the same personal gratification.

- **Imitation:** An individual acquires skills or behaviours by observing and then imitating the skills and behaviours of other members of the family or other social or cultural groups.
- **Identification:** An individual internalizes the beliefs, behaviour, and values of role models into a personal, unique expression of self.

Ideal societal role behaviours are often hard to achieve in real life. Individuals have multiple roles and personal needs that often conflict. For example, an individual may be a mother of small children, a child of elderly parents, a student, and an employee. Each role involves meeting certain expectations. To function effectively in multiple roles, a person must know the expected behaviour and values, desire to conform to them, and be able to meet the role requirements. Successful adults learn to distinguish between ideal role expectations and realistic possibilities. Fulfillment of these expectations leads to an enhanced sense of self. Difficulty or failure in meeting role expectations leads to deficits in the sense of self and often contributes to decreased self-esteem or altered self-concept.

Self-Esteem. Self-esteem is an individual's overall sense of self-worth or the emotional appraisal of self-concept. It represents the overall judgement of personal worth or value. Self-esteem is positive when a person feels capable, worthwhile, and competent (Rosenberg, 1965). Self-esteem is shaped by the individual's appraisals of how he or she is perceived by significant others.

According to Erikson (1963), young children begin to develop a sense of usefulness or industry by learning to act on their own initiative. Children's self-esteem is related to their personal evaluation of their effectiveness at school, within the family, and in social settings. The evaluation of other people such as parents, teachers, and peers has a profound influence on children's self-esteem.

Global self-esteem levels tend to be highest in childhood, possibly because children's sense of self is inflated by a variety of positive sources (Robins et al., 2002). Self-esteem tends to decline in adolescence. This may be partially understood in the context of maturational changes associated with puberty and increased expectations associated with the transition from primary to secondary school. This decline may also be associated with a shift to more realistic information about the self. Some gender differences exist in the adolescent years; for example, boys report greater self-esteem than do girls (Birndorf et al., 2005).

Several factors have been shown to be positively associated with self-esteem in adolescents: for example, family cohesion, greater number of siblings, parental support and social and emotional support from other adult role models (Gomez & McLaren, 2006; Gorbett & Kruczek, 2008; Park, 2003). Adults may foster self-esteem in adolescents by providing positive communication through supportive and caring relationships (Birndorf et al., 2005; Park, 2003). Other factors related to greater self-esteem include family income above the poverty level, safe and nurturing environments, and religious community. Participating in physical activity that is developmentally appropriate and enjoyable can lead to positive self-esteem in boys (Strong et al., 2005) and in girls (Schmatz et al., 2007).

Self-esteem levels rise gradually during adulthood and decline sharply in old age (Robins et al., 2002). In general, this pattern holds true across gender, socioeconomic status, and ethnicity. Erikson's (1963) emphasis on the generativity stage

(see Chapter 21) may explain the rise in self-esteem and self-concept in adulthood. The individual is focused on being increasingly productive and creative at work, while at the same time promoting and guiding the next generation. Other than childhood, the mid-60s represents the highest level of self-esteem across the lifespan. At around 70 years of age, self-esteem declines sharply, which, according to Erikson's theory of psychosocial development, reflects a diminished need for self-promotion and a shift in self-concept to a more modest and balanced view of the self (Robins et al., 2002).

safety alert Lower levels of self-esteem may increase adolescents' tendency to engage in risky behaviours (Biro et al., 2006; Wild et al., 2004). Adolescents are more likely than people of other ages to engage in practices harmful to their health. A decline in self-esteem in adolescence is often associated with an increased need for attention. This need for attention may be demonstrated in unsafe behaviours, such as premature sexual activity, unprotected sex, or substance abuse. In addition, adolescents may take more risks when they begin to drive. These risks threaten adolescents' health and have implications for health care interventions.

To better understand self-esteem, consider the relationship between a person's self-concept and the ideal self. The *ideal self* is a representation of the attributes the person would like to have—an image of the person ideally. The ideal self acts as a motivator that gives the individual an incentive for future behaviour—providing an image of what he or she wants to be or not be. The ideal self is also used as a standard to evaluate the actual self. The ideal self originates in the preschool years and develops throughout life. Early in life, parents set ideals for their children to have certain attributes such as honesty, intelligence, and success. Through socialization practices, children often internalize the ideals of their parents (Zentner & Renaud, 2007). The ideal self is also influenced by other factors such as school, peer relations, and the media. Self-evaluation is an ongoing mental process. In general, a person whose self-concept comes close to matching the ideal self has high self-esteem, whereas a person whose self-concept varies widely from the ideal self suffers from low self-esteem.

A positive sense of self-esteem is an important variable in determining how an individual functions in the world. A person's ability to contribute to society in a meaningful way often affects self-concept and self-esteem. Once established, basic feelings about the self tend to be constant, although they may fluctuate somewhat. A situational crisis may temporarily affect one's self-esteem. Individuals who are sick and unable to be involved in society may feel worthless. Accepting a client as an individual with worth and dignity can help maintain and improve the client's self-esteem.

Stressors Affecting Self-Concept

A self-concept stressor is any real or perceived change that threatens identity, body image, or role performance (Figure 25-3). A stressor challenges a person's adaptive capacities. The most important factor in determining an individual's response is the individual's perception of the stressor. The ability to re-establish balance is related to numerous factors, including the number, intensity and duration of the stressors, and health status (see Chapter 29). The normal process of maturation and development itself is a stressor. Changes that occur in physical, spiritual, emotional, sexual, familial, and sociocultural health

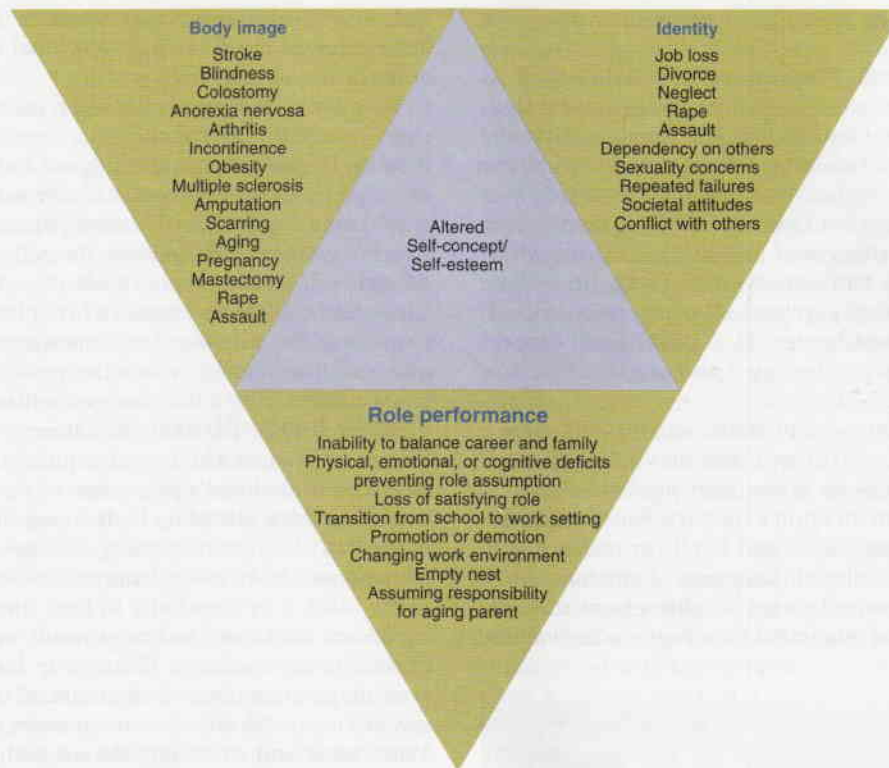


Figure 25-3 Common stressors that influence self-concept.

can affect self-concept. Being able to adapt to stressors is likely to lead to a positive sense of self, whereas failure to adapt may lead to a negative sense of self.

Any change in health can be a stressor that potentially affects self-concept. A physical change can alter body image, thereby affecting identity and self-esteem. Chronic illnesses often alter role performance, which may affect identity and self-esteem. Loss of a partner can lead to loss of identity and lower self-esteem (Van Baarsen, 2002). An essential process in adjusting to loss is the development of a new self-concept. The following case study illustrates the interrelationships among the various components of self-concept.

Amil, a 48-year-old man, has a sudden, unexpected stroke. He had not even been aware that he was hypertensive. Amil awakens in the hospital to find that he cannot move his right hand. He cannot care for himself and is unable to turn himself for days. With the nurses' and physiotherapists' constant encouragement, he is finally able to pull himself out of bed and into a chair. He wonders about the future. Amil's body image has dramatically changed. He used to think of himself as physically strong. Now, he feels weak and helpless. He worries about his family. His older child is away at college, and his younger child is still in high school. Although his wife works, they need both wages to meet their monthly expenses and to educate their children. If his condition does not improve, Amil's role as primary financial provider for his family will drastically change.

Amil's self-esteem diminishes as his recovery and rehabilitation progress slowly. His self-concept has changed from a person who is self-sufficient to someone who must rely on others. Although he returns home and is in rehabilitation, Amil is not able to perform tasks for his family and must wait until his wife and child get home to help him with activities that require strength. Although Amil's physician tells him that he is fortunate to be alive, his adaptation capabilities are stretched to the maximum. His identity is not clear

to him anymore. He has no clear role within the family, his body image has been radically altered, and his self-esteem is low.

Amil continues with physiotherapy. He requires significant time and energy even for simple tasks. Slowly, he begins to gain some strength. After months of rehabilitation and support from an interdisciplinary team of health care providers, he is able to return to work, with some modifications to ensure his safety. He has some diminished mental agility and muscle weakening, but he is able to perform most aspects of his job. His self-esteem and body image improves. Although he still feels somewhat weaker, his physical capabilities closely resemble those he had before the stroke.

Crisis occurs when a person cannot overcome obstacles with his or her usual methods of problem solving and adaptation. Any crisis potentially threatens self-concept and self-esteem. Some crises, such as the one described in the preceding case study, directly affect all components of self-concept. Self-esteem has been shown to be negatively affected by stroke, and this development is strongly associated with depressive mood (Vickery et al., 2008). The stressors created by a crisis—identity confusion, disturbed body image, low self-esteem, role conflict, role strain, role ambiguity, and role overload—may result in illness. For example, a diagnosis of cancer places additional demands on a person's established living pattern. It changes the person's appraisal of and satisfaction with the current level of physical, emotional, and social functioning. Learned resourcefulness, social support, and, in particular, self-esteem are predictive of health-related quality of life for long-term survivors of cancer (Pedro, 2001). Health-related quality of life may increase with interventions such as nurse-led support groups aimed at supporting and improving self-esteem. During self-concept crises, supportive and educative resources can help a person learn new ways of coping and responding

to the stressful event or situation in order to maintain or enhance self-concept.

Identity Stressors. Developmental markers such as puberty, menopause, retirement, and decreasing physical abilities may affect identity. Identity, like body image, is closely related to appearance and abilities. An individual's identity is affected by stressors throughout life, but it is particularly vulnerable during adolescence, a time characterized by physical, emotional, and mental changes of increasing maturity, which can result in insecurity and anxiety. It is also a time when adolescents are developing psychosocial competence, including coping strategies (see Chapter 29). A positive self-concept in adolescence enhances psychological and physical health in young adulthood (Box 25-3).

Adults generally have a more stable identity and thus a more firmly developed self-concept than do younger people. Cultural and social stressors, rather than personal stressors, may have more effect on an adult's identity. For example, an adult may have to balance career and family or make choices regarding religious or cultural traditions. Retirement may mean the loss of an important means of achievement and continued success. People at retirement may begin to re-evaluate

their identities and accomplishments. Loss of a significant other can lead the surviving individual to re-examine aspects of his or her identity.

Identity confusion results when people do not maintain a clear, consistent, and continuous consciousness of personal identity. It may occur at any stage of life if a person is unable to adapt to identity stressors. Under extreme stress, an individual may experience disturbed personal identity, a state in which the differences between the self and others cannot be determined. One example of identity confusion is when an adolescent realizes that some of his or her feelings and behaviours could be understood as homosexual. A period of anxiety and confusion begins, when the possibility of being homosexual clashes with a heterosexual self-image.

Body Image Stressors. Changes in appearance, structure, or function of a body part requires an adjustment in body image. An individual's perception of the change and the relative importance placed on body image affects the significance of the loss of function or change in appearance. For example, if a woman's body image incorporates reproductive functions as the ideal, a hysterectomy to treat uterine cancer may be a significant alteration and may result in a perceived loss of femininity or wholeness. Changes in body appearance, such as an amputation, facial disfigurement, or scars from burns or surgery, are physically obvious stressors affecting body image. Mastectomy and colostomy are surgical procedures that alter body appearance and function; although these changes are usually undetected by other people, they nonetheless have a significant effect on the individual. Even elective changes such as breast augmentation or reduction can affect body image. Chronic illnesses such as heart and renal disease affect body image because the body no longer functions at an optimal level. Anticipated body changes resulting from developmental processes can also affect body image. In addition, the effects of pregnancy, significant weight gain or loss, pharmacological management of illness, or radiation therapy change body image. Negative body image can lead to adverse health outcomes.

Many people associate success with a specific body part or function. For example, athletes may consider their bodies and physical activities to be the focus of personal success. Adaptation and rehabilitation may be affected if they can never again participate in athletics because of an accident or injury. To a surgeon, an amputation of a finger would significantly alter his or her ability to perform surgery. This change may affect the person's perception of his or her self-worth. Body image changes necessitate the revision of long-accepted self-perceptions, as well as alterations in lifestyle. To regain a positive self-concept and self-esteem, each person must adapt to his or her body image stressors.

Society's response to an individual's physical changes may be affected by the conditions surrounding the alteration. For example, in response to paralysis resulting from an act of war, an individual may be treated as a hero and may be praised for self-sacrifice. However, paralysis resulting from a car accident in which the person was intoxicated may elicit a very different response from society.

Role Performance Stressors. Throughout life, a person undergoes numerous role changes. Normal changes associated with growth and maturation result in developmental transitions. Situational transitions occur when parents, spouses, children, or friends die or when people move, marry, divorce, or change jobs. A health-illness transition is changing

* BOX 25-3 RESEARCH HIGHLIGHT

Adolescent Self-Concept and Health

Research Focus

The literature on adolescent self-concept is considerable, but little is known about the long-term effect of self-concept on health. By understanding the role of self-concept in adolescent health, you can develop strategies to promote adolescent health and design health education programs to meet the needs of this population.

Research Abstract

The purpose of Park's (2003) longitudinal study was to examine factors associated with adolescent self-concept and the effect of adolescent self-concept on psychological health, physical health, and health-related behaviour in later adulthood. Park analyzed data from two cycles of the National Population Health Survey, a general health survey of a representative sample of Canadians aged 12 years or older in the 10 provinces. The data revealed that girls tend to have lower self-concept in adolescence than do boys of the same age. A stronger self-concept was positively associated with higher family income and with adolescents' perceived level of emotional support. A weak self-concept was predictive of depression six years later among girls, physical inactivity among boys, and obesity among adolescents of both sexes. A strong self-concept had a positive long-term effect on girls' (but not boys') self-perceived health.

Evidence-Informed Practice

- Adolescent self-concept and self-esteem are important issues to be addressed in a variety of settings when adolescent health is promoted.
- Emotional support must be provided to adolescents, and they must be assisted in accessing emotional support from significant others in their lives.
- To strengthen health promotion policies and health education programs, strategies to enhance adolescents' self-concept and self-esteem should be included.

Reference: Park, J. (2003). Adolescent self-concept and health into adulthood [Catalogue 82-003]. *Health Reports*, 14, 41–52.



from a state of health or well-being to one of illness. A shift along the continuum from illness to wellness is as stressful as a shift from wellness to illness. Any of these transitions may lead to role conflict, role ambiguity, role strain, or role overload.

Role conflict results when a person simultaneously assumes two or more roles that are inconsistent, contradictory, or mutually exclusive. For example, when a middle-age woman with teenage children assumes responsibility for caring for her older parents, conflicts may arise in relation to being both the adult child and the caregiver of her parents. Role conflicts can occur when trying to balance time and energy between her children and parents. The perceived importance of each conflicting role influences the degree of conflict experienced. The **sick role** involves the expectations of other people and society about how a person should behave when sick. Role conflict may occur when general societal expectations (“Take care of yourself and you will get better”) and the expectations of co-workers (“The job needs to get done”) collide. The conflict of taking care of oneself while getting everything done can be a major challenge.

Role ambiguity involves unclear role expectations. When expectations are unclear, people may be unsure about what to do or how to behave. Such situations are often stressful and confusing. Role ambiguity is common in adolescence. Parents, peers, and the media pressure adolescents to assume adultlike roles, but many adolescents lack the resources to move beyond the role of dependent children. Role ambiguity can occur in employment situations. Employees may become unsure about job expectations in complex, rapidly changing, or highly specialized organizations.

Role strain is the stress or strain experienced by an individual when behaviours, expectations, or obligations associated with a single social role are incompatible. Individuals who feel inadequate or unsuited for a new social role may experience role strain. For example, individuals who marry someone with children often feel unprepared to assume the parental role. Role strain is also associated with gender role stereotypes (Stuart & Laraia, 2005). Some people perceive women in positions traditionally held by men as less competent, less objective, or less knowledgeable than their male counterparts. Women may feel that they must work harder and perform better in order to compete. Men in traditionally female roles may also encounter gender bias; for example, male nurses frequently report gender stereotyping by clients and other health care providers (Meadus & Twomey, 2007). One such stereotype suggests that male nurses are viewed as less caring than are female nurses.

Role overload involves having more roles or responsibilities within a role than are manageable. It is frequently reflected in unsuccessful attempts to meet the demands of work and family while still having some personal time. During periods of illness or change, the people involved, either as the person who is ill or as a significant other, often find themselves in role overload. Women are more likely than men to report high levels of role overload (Duxbury & Higgins, 2003). Findings from the 2005 National Survey of the Work and Health of Nurses in Canada shows that a disproportionately high number of nurses report role overload (e.g., arriving at work early or staying late to get work done). High role overload was more common among nurses in hospitals or long-term care facilities than among nurses working in community health, and more common among registered nurses (RNs) than

licensed practical nurses (LPNs) or registered psychiatric nurses (RPNs) (Statistics Canada, 2006).

Self-Esteem Stressors. Individuals with high self-esteem are generally more resilient and are better able to cope with demands and stressors than are those with low self-esteem. High self-esteem is associated with more optimal mental and physical health, greater control over circumstances, and greater adaptation and productivity in adulthood (Trzesniewski et al., 2006). Low self-worth can contribute to feeling unfulfilled and isolated from others and can result in depression and unremitting uneasiness or anxiety. Illness, surgery, or accidents that change life patterns can also influence feelings of self-worth. Chronic illnesses such as diabetes, arthritis, and cardiac dysfunction necessitate changes in accepted and long-assumed behavioural patterns. The more the chronic illness interferes with the ability to engage in activities contributing to feelings of worth or success, the more it affects self-esteem.

Self-esteem stressors vary with developmental stages. Perceived inability to meet parental expectations, harsh criticism, inconsistent discipline, and unresolved sibling rivalry may reduce children’s sense of self-worth. Ineffective parenting also is associated with low self-esteem in children. Low self-esteem takes a toll on children. Children with low self-esteem and self-worth are more likely to bully other children and are more likely to be bullied (Christie-Mizell, 2003; Box 25-4). Low self-esteem in adolescence is one of the strongest predictors of depression (MacPhee & Andrews, 2006) and is related to thoughts about suicide (Wilburn & Smith, 2005). A developmental milestone such as pregnancy also introduces unique self-concept stressors and has significant implications for health. Low self-esteem is one of the strongest predictors of postpartum depression (Beck, 2008). In older adults, self-concept stressors include health problems, reduced functional ability, and stressful life events and circumstances (Box 25-5).

The Family’s Effect on Development of Self-Concept

The family plays a key role in creating and maintaining each family member’s self-concept. Children develop a basic sense of who they are from their caregivers. Bowlby’s (1982) attachment theory suggests that the quality of the attachment that children develop with their caregivers influences the development of a set of expectations about the self, their interpretations of the actions of other people, and ideas about how to respond to them. Attachment theory suggests that children who experience sensitive and supportive caring will develop expectations that they are worthy of other people’s love and that other people are supportive. The quality of parenting interactions also influences children’s development. Parents who respond in a firm, consistent, and warm manner promote positive self-esteem in their children (Ruiz et al., 2002). Parents who are harsh, behave inconsistently, or have low self-esteem themselves may foster negative self-concepts in their children. Even well-meaning parents can cultivate negative self-concepts in children. To assist clients in developing a positive self-concept, it is important to assess the family’s style of relating (see Chapter 19).

The Nurse’s Effect on the Client’s Self-Concept

Your acceptance of a client with an altered self-concept helps promote positive change. When a client’s physical appearance

BOX 25-4 RESEARCH HIGHLIGHT

Bullying and Self-Concept

Research Focus

Bullying is defined as physical, psychological, or verbal intimidation or attack, or a combination of these, that is meant to cause distress, harm, or both to an intended victim. In Canada, approximately 15% of school-aged children report being bullied in the classroom, schoolyard, or playground. Some studies, however, indicate that bullying behaviour among children is increasing and is committed by younger children than in the past. Bullying is a serious problem both for the victims and the children who bully others.

One explanation for why children bully other children focuses on self-concept. Studies have shown that children with a positive self-concept are less likely to bully other children, engage in delinquent behaviour, or be instigators of peer conflict (Coloroso, 2002). In addition, children with a positive self-concept are less likely to be bullied. The family environment and, in particular, parenting behaviours influence children's self-concept.

Research Abstract

The objective of Christie-Mizell's (2003) study was to examine how the quality of the parental relationships (specifically, conflict between the parents) affects children's self-concept and participation in bullying behaviour. The researcher analyzed data from children aged 8 to 14 years who participated in the National Longitudinal Survey of Youth, a national survey of American children. The data revealed that participation in bullying behaviour is significantly tied to a child's self-concept. Lower self-concept was associated with an increase in bullying behaviour. In addition, the effect of parental conflict on children's bullying behaviour was mediated by the child's self-concept.

Evidence-Informed Practice

- Building children's self-concept is an important strategy to prevent bullying behaviour in children and to prevent being victimized by a bully.
- Parents must be helped to understand how children are affected by parental conflict and the family environment.
- It is important to involve the entire family system in the intervention process when children are identified as victims or bullies.
- Referral to other health care providers may be necessary to assist vulnerable children and families.

Reference: Christie-Mizell, C. A. (2003). Bullying: The consequences of interparental discord and child's self-concept. *Family Process, 42*(2), 237–251.



BOX 25-5 FOCUS ON OLDER ADULTS

- Promoting a positive self-concept in all older adults is essential, but it is especially important for those experiencing disability, frailty, or reduced functional capacity (Vickery et al., 2008).
- Conducting a life review or participating in a reminiscence group, recording an oral history, or making a photo scrapbook of meaningful life events are examples of activities to help older adults feel a sense of self-worth while providing a legacy for younger family members (Eliopoulos, 2005).
- Potential threats to the self-esteem of older adults may arise from the institutional environments where they receive care. These threats can include dependence, devaluation, depersonalization, functional impairments, and lack of control over one's environment. Nursing interventions directed toward reducing or eliminating these threats can improve older adults' quality of life.
- Self-concept may be negatively affected in older adulthood by a number of life changes, including health problems, reduced functional ability, declining income or socioeconomic status, spousal loss or bereavement, loss of social support, and decline in achievement experiences after retirement (Stuart & Laraia, 2005).
- Health care providers should be alert to older adults' preoccupation with physical complaints; they should conduct a comprehensive assessment and encourage clients to verbalize needs, feelings, and emotions such as fear, insecurity, and loneliness (Robins et al., 2002).
- By actively listening and accepting the person's feelings, being respectful, praising health-seeking behaviours, and recognizing, acknowledging, and praising accomplishments, health care providers convey respect for the older person's worth.



has changed, likely both the client and the family will observe your verbal and nonverbal responses and reactions. You need to be aware of your own feelings, ideas, values, expectations, and judgements. Self-awareness is critical in initially understanding and accepting others. Nurses who are secure in their own identities more readily accept and thus reinforce clients' identities. It is important to assess and clarify the following self-concept issues:

- Thoughts and feelings about lifestyle, health, and illness
- Awareness of how nonverbal communication may affect clients and families
- Personal values and expectations and how they affect clients
- Ability to convey a nonjudgemental attitude toward clients

- Preconceived attitudes toward cultural differences in self-concept and self-esteem

Some clients with a change in body appearance or function are very sensitive to health care providers' verbal and nonverbal responses. A positive and matter-of-fact approach to care can provide a model for the client and family to follow. You can have a positive effect by conveying genuine interest and acceptance. By recognizing and including self-concept issues in planning and delivering care, you can positively influence client outcomes. By building a trusting nurse–client relationship and appropriately involving the client and family in decision making, you can enhance self-concept. An individualized approach may highlight a client's unique needs, including incorporating alternative health care practices or methods of spiritual expression.

You also can significantly influence a client's body image. For example, for a woman who has undergone a mastectomy, you can affect her body image in a positive way by showing acceptance of the mastectomy scar. Clients closely watch other people's reactions to their wounds and scars. A facial expression of shock or disgust can lead to development of a negative body image. It is important to monitor your responses. Statements such as "This wound is healing nicely" or "The tissue looks healthy" are very affirming for a client. Nonverbal behaviours help to convey caring for a client and can affect self-esteem (Figure 25-4). For example, the self-concept of an



Figure 25-4 Nurses can use touch and eye contact to enhance a client's self-esteem.

incontinent client can be threatened by the perception that the caregivers find the situation unpleasant. Anticipate personal reactions, acknowledge them, and focus on the client instead of on the unpleasant task or situation. Imagining yourself in the client's position will help you find strategies and measures to ease your client's embarrassment, frustration, and anger.

Preventive measures, early identification, and appropriate treatment can minimize the intensity of self-esteem stressors and the potential effects on the client and family. Learn to design specific self-concept interventions to fit a client's profile of risk factors. It is essential to assess the client's perception of a problem and to work collaboratively with the client to resolve self-concept issues (Box 25-6). It may also be necessary to work with other members of the health care team to resolve issues related to self-concept.

Critical Thinking

Self-concept profoundly influences a person's response to illness. A critical thinking approach to care is essential. This approach requires synthesis of knowledge, experience, information gathered from clients and families, critical thinking qualities, and intellectual and professional standards. Solid clinical judgement requires anticipating the required information, collecting and analyzing the data, and making appropriate decisions regarding client care.

In the case of self-concept, it is essential to integrate knowledge from nursing and other disciplines, including self-concept theory and communication principles, and to consider cultural and developmental factors. Previous experience in caring for clients with alterations in self-concept assists you in individualizing care for each client. The nursing process continues until the client's self-concept is improved, restored, or maintained.

Self-Concept and the Nursing Process

❖ Assessment

In assessing self-concept, you must focus on the various components of self-concept: identity, body image, role performance, and self-esteem. Assessment should include observing behaviours suggestive of an altered self-concept (Box 25-7), actual and potential self-concept stressors (see the earlier case

BOX 25-6 RESEARCH HIGHLIGHT

Promoting a Healthy Body Image

Research Focus

In North American society, sociocultural norms for appearance suggest to girls and women that their value is determined by their appearance. The media typically play an important role in depicting women as thin, youthful, and beautiful. Women for whom this standard is unrealistic feel self-conscious and dissatisfied with their bodies. The extent to which women internalize society's standards for thinness is associated with body dissatisfaction and represents a risk factor for eating disorders.

Research Abstract

Strahan et al. (2008) tested whether sociocultural norms for ideal appearance leads women to base their self-worth more strongly on appearance. In the first study, the researchers presented images reflecting norms of thinness (e.g., one commercial featuring models wearing Victoria's Secret bras) to female university students; then they measured whether these images had a direct effect on the students' body satisfaction and concern with others' perceptions and whether appearance-contingent self-worth accounted for these effects. Results showed that exposure to images conveying the sociocultural norm for beauty influenced the students' perceptions of satisfaction with their bodies. The second study was conducted with students in public schools. Students received an intervention that challenged the legitimacy of sociocultural norms for ideal appearance. Results showed that in comparison with control subjects, students receiving the intervention were less accepting of sociocultural norms for appearance, based their self-worth less strongly on appearance, and in turn were less concerned with others' perceptions and were more satisfied with their bodies.

Evidence-Informed Practice

- Promoting empowerment, building self-esteem, and developing positive self-concept in girls and women are important health promotion strategies.
- Body weight concerns and coping strategies are important issues for nurses to address with girls and women.
- Nurses should increase clients' awareness of the role of the media and popular culture in promoting unrealistic and unhealthy standards.

Reference: Strahan, E. J., Lafrance, A., Wilson, A. E., Ethier, N., Spencer, S. J., & Zanna, M. P. (2008). Victoria's dirty little secret: How sociocultural norms influence adolescent girls and women. *Personality and Social Psychology Bulletin*, 34(2), 288–301.

study), and coping patterns. Nurses need to be sensitive to the effect that cultural influences have on the client's behaviours and needs. Some behaviours suggestive of an altered self-concept for someone in one culture may be normal for individuals in other cultures. For example, in many First Nations and Asian cultures, eye contact is a sign of disrespect. In order to gather comprehensive assessment, information from multiple sources must be synthesized critically (Figure 25-5).

At appropriate times, you will need to ask specific questions to assess your client's self-concept, paying close attention to your client's responses (Table 25-1). It is crucially important to closely observe nonverbal behaviour. Note the manner in which clients talk about significant people in their lives. This can provide clues to both stressful and supportive

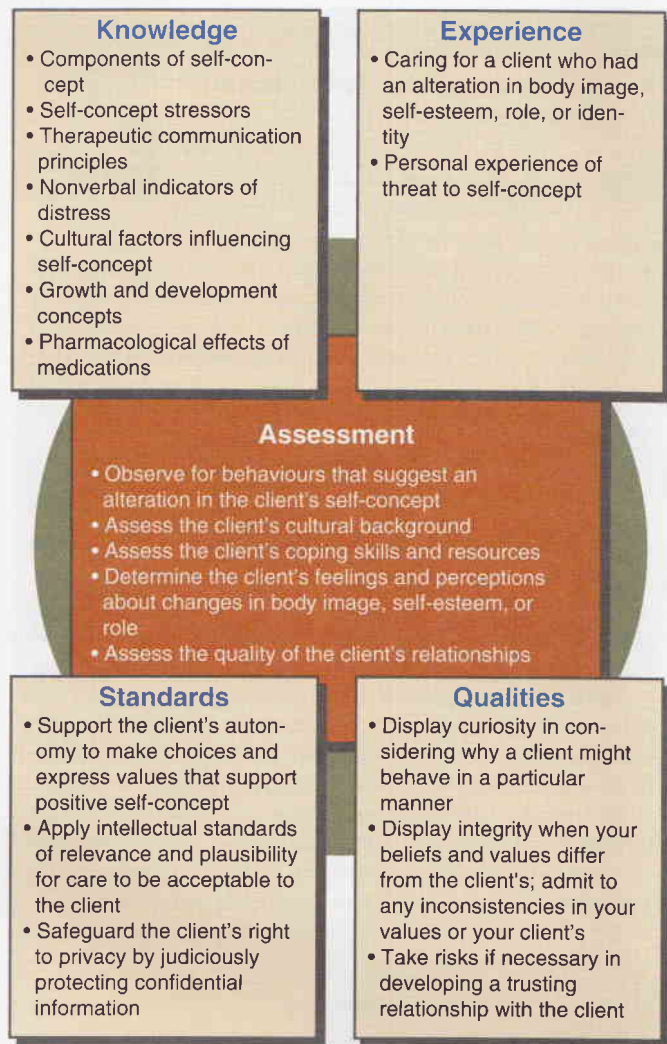


Figure 25-5 Critical thinking model to assess self-concept.

► BOX 25-7

Behaviours Suggestive of Altered Self-Concept

- Avoidance of eye contact
- Slumped posture
- Unkempt appearance
- Being overly apologetic
- Hesitant speech
- Being overly critical or angry
- Frequent or inappropriate crying
- Negative self-evaluation
- Being excessively dependent
- Hesitancy in expressing views or opinions
- Lack of interest in what is happening
- Passive attitude
- Difficulty in making decisions

relationships, as well as to key roles that the client assumes. Using knowledge of developmental stages to determine what areas are likely to be important to the client, inquire about these aspects of the person's life. For example, ask an older client about his or her life and what has been important to him or her. At this stage of development, individuals are examining

► TABLE 25-1

Nursing Assessment of Client's Self-Concept

Assessment Questions*

Responses Reflecting Difficulties With Self-Concept

Identity

"How would you describe yourself?"

Derogatory answers (e.g., "I don't know; not too much is worth mentioning") should raise concern.

Body Image

"What aspects of your appearance do you like?"

Most people can identify something positive about their appearance (e.g., "I have nice eyes").

"Would you like to change any aspects of your appearance? If yes, describe the changes you would make."

If a person cannot identify any positive characteristic, this may suggest a negative body image and poor self-esteem. Most people have something that they would like to change (e.g., "My nose is too big" or "My hips are too large"), but a long list of problem areas may suggest difficulties with self-concept.

Self-Esteem

"Tell me about the things you do that make you feel good about yourself."

Statements about not having any strengths or being able to do anything well should raise concern.

"How do you feel about yourself?"

Statements that are very negative about themselves should raise concern (e.g., "I am hopeless" or "I have never felt good about myself").

Role Performance

"Tell me about your primary roles (e.g., partner, parent, friend, sister, employee, volunteer). How effective are you at carrying out each of these roles?"

Listen for the different roles identified. A large number of primary roles increase the risk for role conflict and role overload. As with previous questions, if the client indicates that he or she does not believe that these roles are adequately covered, the client may be experiencing alterations in self-concept. Most people carry out several roles and often feel as though some of them are not adequately addressed; listen for the client's perception about his or her overall role competency.

*In addition to the client's verbal response, note any nonverbal behaviours. A negative self-concept is suggested by hesitant speech, lack of interest in what is happening, and slumped posture.

their lives and considering the effects they have had in the world. The individual's conversation will probably provide data relating to role performance, identity, self-esteem, stressors, and coping patterns.

Coping Behaviours

Nursing assessment should also include consideration of previous coping behaviours; the nature, number, and intensity of the stressors; and the client's internal and external resources. Knowledge of how a client has handled past stressors can enable insight into the client's style of coping. People do not

address all issues in the same way, but they often use a familiar coping pattern for newly encountered stressors. As previous coping patterns are identified, it is useful to determine whether these patterns have contributed to healthy functioning or created more problems. For example, abused women sometimes use alcohol or drugs to cope with the abuse, but the use of these harmful substances only creates additional stressors (see Chapter 29).

Exploring resources and strengths, such as the availability of significant others or prior use of community resources, can be important when developing a realistic and effective plan. It is also critical to understand how a client views a situation. For example, older women may be more accustomed to changes in their health status because of the aging process in general, and experiencing heart disease may be one more aspect of growing older. On the other hand, a cardiac event occurring in middle age may be less expected and more problematic for women because of family and career responsibilities and may thus elicit greater anxiety.

Significant Others

Significant others can help identify changes in a client's behaviour that may suggest alterations in self-concept. These individuals may have insights into the client's way of dealing with stressors or knowledge about what is important to the client's self-concept. The way a significant other talks about the client and the significant other's nonverbal behaviours may provide information about what kind of support is available for the client.

Clients' Expectations

The client's expectations are another important factor to consider when assessing self-concept. Asking a client what he or she thinks you can do to help is important. Collaborating with clients is essential so that interventions are acceptable to them. Asking a client how he or she thinks the interventions will make a difference elicits useful information regarding the client's expectations and provides an opportunity to discuss the client's goals. For example, while working with a client who is experiencing anxiety related to an upcoming diagnostic test, you might ask about the relaxation exercise that he or she has been practising. The client's response provides valuable information about his or her beliefs and attitudes regarding the efficacy of the intervention, as well as the potential need to modify the nursing approach.

❖ Nursing Diagnosis

Carefully consider the assessment data to identify a client's actual or potential problem areas. Rely on knowledge and experience, apply appropriate professional standards, and look for clusters of defining characteristics that indicate a nursing diagnosis. Although multiple nursing diagnostic labels exist for altered self-concept, the following list provides examples of self-concept-related nursing diagnoses:

- *Impaired adjustment*
- *Anxiety*
- *Disturbed body image*
- *Caregiver role strain*
- *Decisional conflict*
- *Ineffective coping*
- *Ineffective denial*
- *Fearful*

► BOX 25-8 NURSING DIAGNOSTIC PROCESS

Assessment Activities	Defining Characteristics	Nursing Diagnosis
Observe client's behaviour during conversation.	Client demonstrates restlessness, inability to maintain eye contact, facial tension, increased perspiration, and self-preoccupation.	Anxiety related to accidental injury, pain, uncertainty of outcome of upcoming surgery
Empathically communicate, "Tell me how you are coping" or "How are you feeling about tomorrow's procedure?"	Client replies, "I'm scared. They may amputate my leg tomorrow. I don't know how I'll manage. I was awake all night. I just kept thinking about everything."	

- *Hopelessness*
- *Disturbed personal identity*
- *Risk for loneliness*
- *Ineffective role performance*
- *Chronic low self-esteem*
- *Situational low self-esteem*
- *Ineffective sexuality patterns*
- *Impaired social interaction*
- *Spiritual distress*
- *Risk for self-directed violence*

Making nursing diagnoses about self-concept is complex. Often, isolated data could be the defining characteristics for more than one nursing diagnosis (Box 25-8). For example, a client might express feelings of uncertainty and inadequacy. These are defining characteristics for both anxiety and situational low self-esteem. If the client is demonstrating defining characteristics for more than one nursing diagnosis, then gather specific data to validate and differentiate the underlying problem. To further assess the possibility of anxiety as the nursing diagnosis, you might consider whether the client has any of the following defining characteristics: Is the person experiencing increased muscle tension, shakiness, a sense of being "rattled," or restlessness? These symptoms may suggest anxiety rather than low self-esteem. On the other hand, if the person expresses a predominantly negative self-appraisal, including inability to handle situations or events and difficulty making decisions, then situational low self-esteem may be the more appropriate nursing diagnosis. To further aid in differentiating between the two diagnoses, information regarding recent events in the person's life and how the person has viewed himself or herself in the past provides insight into the most appropriate nursing diagnosis. As additional data are gathered, usually the priority nursing diagnosis becomes evident.

To validate critical thinking regarding a nursing diagnosis, it is important to share observations and allow the client to provide input and verify perceptions. This approach often encourages the client to provide additional data, which further clarifies the situation. In the example in Box 25-8, if you said,

"I notice you haven't eaten much lunch today," the response to this statement, coupled with the client's nonverbal communication, could facilitate further discussion. An alternative approach may be to state, "I notice you jumped when I came up behind you. Are you feeling uneasy today?" This statement allows the client to verify whether he or she is in fact anxious and to discuss any concerns.

❖ Planning

During planning, synthesize knowledge, experience, critical thinking qualities, and standards (Figure 25-6). Critical thinking ensures that the nursing care plan integrates all that you know about the individual, as well as key critical thinking elements (Box 25-9). Professional standards are especially important to consider when you develop a plan of care. These standards often establish ethical or evidence-informed practice guidelines for selecting effective nursing interventions.

Another method used to help plan nursing care is a concept map. The concept map illustrated in Figure 25-7 shows the relationship between a medical diagnosis, postoperative reconstruction of severe facial scars, and the four nursing diagnoses. The concept map also links the nursing diagnoses and shows how they are interrelated. In this example, disturbed body image is related to situational low self-esteem. As the client's facial scars improve, she should begin to feel better about her appearance.

Goals and Outcomes

In collaboration with the client, you should develop an individualized plan of care for each nursing diagnosis. Goals should be established that are individualized, are realistic, and have measurable outcomes. It is important to consult with the client about whether the goals are perceived as realistic. By consulting with the client and with significant others, mental health clinicians, and community resources, you can design a

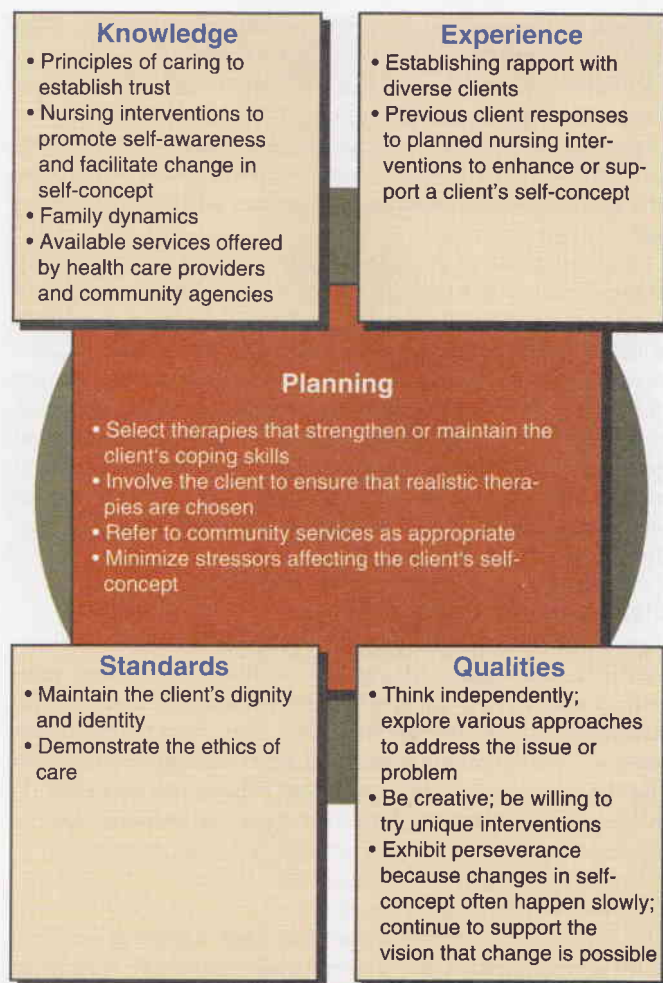


Figure 25-6 Critical thinking model for self-concept planning.

► BOX 25-9 NURSING CARE PLAN

Disturbed Body Image

Assessment

You have been assigned to care for Ms. Johnson, a 45-year-old married woman who underwent a unilateral radical mastectomy because of malignancy. Ms. Johnson's physical assessment has been completed, and she has received adequate medication for pain. You sit down to discuss how the mastectomy has affected Ms. Johnson's self-concept.

Assessment Activities

Assess identity concerns (e.g., sexual role, femininity).

Findings and Defining Characteristics

Ms. Johnson looks away, shakes her head, and states, "I don't feel feminine. My husband says it won't affect how he feels about me, but I'm sure it will."

Ask Ms. Johnson how the mastectomy is affecting her sense of self.

Intermittent eye contact, frequent crying when alone, pulling hospital gown tightly across chest

Observe Ms. Johnson's mood and interactions with others, including family members.

Has superficial conversations with staff and family members

Determine Ms. Johnson's participation in self-care activities.

Avoids looking in mirror and touching or looking at the dressing; ignoring basic hygiene (e.g., bathing, combing hair, or brushing teeth)

Nursing Diagnosis: Disturbed body image related to negative thoughts and feelings to actual change in body

BOX 25-9 NURSING CARE PLAN—cont'd

Planning

Goal (Nursing Outcomes Classification)*

Ms. Johnson will identify and express feelings verbally and nonverbally.

Ms. Johnson will participate in self-care related to mastectomy.

Ms. Johnson will identify and use resources outside the hospital.

Expected Outcomes

Body Image

Ms. Johnson will discuss disturbed body image with staff members and significant others within 3 days. Ms. Johnson will consider exploring support groups by the time of discharge.

Acceptance and Health Status

Ms. Johnson will look at tissue surrounding surgical site within 2 days. Ms. Johnson will begin to attend to basic hygiene needs within 2 days.

Social Involvement

Ms. Johnson will verbalize commitment to participating in community resources (e.g., mastectomy support group) by the time of discharge. By postoperative visit, Ms. Johnson will determine whether she wishes to attend support group.

*Outcome classification labels from Moorhead, S., Johnson, M., Maas, M., & Swanson, E. (Eds.). (2008). *Nursing outcomes classification (NOC)* (4th ed.). St Louis, MO: Mosby.

Interventions (Nursing Interventions Classification)[†]

Initially assign the same staff members to work with Ms. Johnson.

Approach Ms. Johnson and initiate conversation; use silence and active listening to promote communication.

Remain aware of your own feelings regarding Ms. Johnson's bodily changes and physical appearance.

Have Ms. Johnson spend time alone and with supportive family members for crying, recording in her journal, reflection, or prayer.

Facilitate evaluation of overall self-concept.

Involve Ms. Johnson's husband in discussion of uncomfortable issues, such as sexual concerns.

Assist Ms. Johnson in identifying and using appropriate support systems outside the hospital, including home health care.

Rationale

Continuity in care will facilitate the establishment of a therapeutic relationship; familiarity and trust will enhance communication.

Ms. Johnson's ability to initially find the words for what she is experiencing may be limited.

Inadvertently communicating your own discomfort or negativity will interfere with Ms. Johnson's ability to openly communicate her feelings.

This use of time encourages expression of thoughts and feelings, including depression, grief, resentment, and fear of rejection. Family involvement is an essential element of comprehensive care.

The effect on body image may influence other aspects of self-concept and self-esteem, including perception of identity and role performance.

Sexuality is a basic need and concern for both men and women, and yet it can be one of the most difficult discussions for clients to initiate.

Support can assist the client in feeling normal again and in integrating a new body image into her self-concept.

[†]Intervention classification labels from Bulechek, G. M., Butcher, H. K., & Dochterman, J. M. (Eds.). (2008). *Nursing interventions classification (NIC)* (5th ed.). St Louis, MO: Mosby.

Evaluation

Nursing Actions

Ask Ms. Johnson how effective she feels in her ability to identify and express feelings verbally and nonverbally.

Observe Ms. Johnson's participation in self-care related to mastectomy.

Assist Ms. Johnson in identifying resources outside the hospital; secure a commitment to use resources.

Client Response and Finding

Ms. Johnson responds, "It's hard for me to talk about myself, but I have really made an effort to talk about what the loss of my breast means to me."

Ms. Johnson assumes responsibility for basic hygiene immediately after establishing the goal and has used a mirror to examine her mastectomy scar.

Ms. Johnson verbalizes commitment to participating in community resources (e.g., mastectomy support group).

Achievement of Outcome

Ms. Johnson reports improvement in communication skills and success with discussing disturbed body image with primary nurse and husband.

Ms. Johnson has increased her independence and has begun to integrate body image change into her self-concept.

Outcome has not been completely achieved; Ms. Johnson has expressed hesitancy in attending a support group but is receptive to home care. Home care nurse will ensure that goal is re-evaluated and addressed as appropriate.

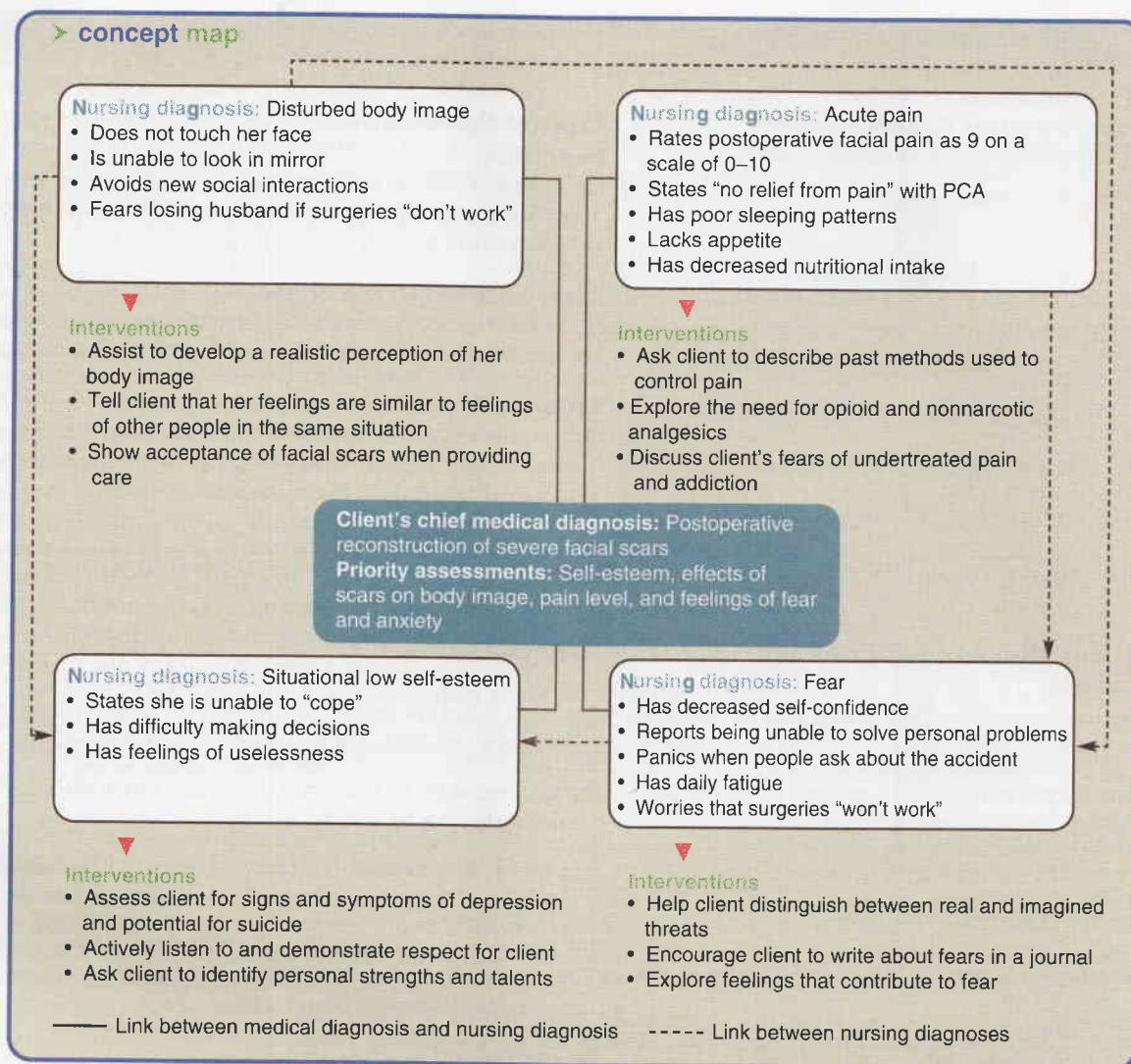


Figure 25-7 Concept map for client after surgical reconstruction of severe facial scars. PCA, Patient (client)-controlled analgesia.

more comprehensive and workable plan. Once a goal has been formulated, consider how the data that illustrated the problem would change if the problem were diminished. These changes should be reflected in the outcome criteria. For example, a client receives a diagnosis of *situational low self-esteem related to a recent job layoff*. You and the client establish a goal:

"Client's self-esteem and self-concept should begin to improve in two weeks." Examples of expected outcomes directed toward that goal include the following:

- The client will discuss a minimum of three areas of his or her life in which he or she is functioning well.
- The client will be able to voice the recognition that losing the job is not reflective of his or her worth as a person.
- The client attends a support group for out-of-work individuals.

Setting Priorities

The care plan lists the goals, expected outcomes, and interventions for a client with an alteration in self-concept. Interventions focus on helping the client adapt to the stressors that led to the disturbance in self-concept and on supporting successful

coping. A client may perceive a situation as overwhelming and may feel hopeless about returning to the previous level of functioning. The client may need time to adapt to physical changes.

Establishing priorities may include therapeutic communication to address self-concept issues to ensure that the client's ability to address physical needs is maximized. Look for strengths in both the client and the family, and provide resources and education to assist the client in changing limitations into strengths. Client teaching creates an understanding of the normality of certain situations (e.g., the nature of a chronic disease, change in a relationship, or the effect of a loss). Often, once this is understood, the sense of hopelessness and helplessness decreases.

Continuity of Care

The perceptions of significant others must be incorporated into the plan of care. Clients who have experienced deficits in self-concept before the current episode of treatment may have established a system of support that includes mental health clinicians, clergy, and other community resources. Before

involving the family, consider the client's desires for the family's involvement and cultural norms regarding who most frequently makes decisions in the family.

❖ Implementation

As with all the steps of the nursing process, a therapeutic nurse–client relationship is central to the implementation phase. Once the goals and outcome criteria have been developed, consider nursing interventions to promote a healthy self-concept and help the client move toward achieving the goals. To develop effective nursing interventions, consider the nursing diagnosis and broad interventions that address the diagnosis. These broad, standard interventions should be tailored to the individual client. Regardless of the health care setting, it is important to work with clients and their families or significant others to promote a healthy self-concept. For example, nursing interventions may include strategies to help clients regain or restore the elements that contribute to a strong and secure sense of self. The approaches that you choose will vary according to the level of care required.

Health Promotion

Work with clients to help them develop healthy lifestyle behaviours that contribute to a positive self-concept (Box 25-10).

Acute Care

In the acute care setting, some clients experience potential threats to their self-concept because of the nature of the treatment and diagnostic procedures. Threats to a person's self-concept can result in anxiety or fear. Numerous stressors,

including unknown diagnoses, the need to make changes in lifestyle, and change in functioning, may be present and need to be addressed. In the acute care setting, more than one stressor is often present, which increases the overall stress level for the client and family.

Nurses in the acute care setting also encounter clients who are faced with the need to adapt to an altered body image as a result of surgery, accidents, or other physical change. Sometimes, threats to self-concept and the need to adapt result in aggressive behaviour. Often a visit by someone who has experienced similar changes and adapted to them (e.g., someone who has undergone a laryngectomy or a mastectomy) may be helpful. The timing of such a visit is important. Because addressing these needs may be difficult while the client is in an acute care setting, appropriate follow-up and referrals, including home care, are essential. Remain sensitive to the client's level of acceptance. Forcing confrontation with the change before the client is ready could delay the client's acceptance. Signs that a client may be receptive to such a visit include the client's asking questions related to how to manage a particular aspect of what has happened or looking at the changed area. As the client expresses readiness to integrate the body change into his or her self-concept, let the client know about groups that are available, and make the initial contact.

Restorative Care

Often, in a long-term nurse–client relationship in a home care environment, nurses have the opportunity to work with clients to attain a more positive self-concept (Box 25-11). Interventions designed to help clients attain a positive self-concept are based on the premise that the client first develops insight and self-awareness concerning problems and stressors and then acts to solve the problems and cope with the stressors. This approach, outlined by Stuart and Laraia (2005), can be incorporated into client teaching for alterations in self-concept, including situational low self-esteem, which might manifest in the home care setting.

Increasing the client's self-awareness is achieved through establishing a trusting nurse–client relationship that allows the client to openly explore thoughts and feelings. A priority nursing intervention is the expert use of communication skills to clarify client and family expectations. Open exploration can make the situation less threatening and encourages behaviours that expand self-awareness. You encourage the client's self-exploration by accepting the client's thoughts and feelings, by helping the client clarify interactions with others, and by being empathetic. Encourage self-expression, and stress the client's self-responsibility. To promote the client's self-evaluation, help the client to define problems clearly, and identify positive and negative coping mechanisms. Work closely with the client to help analyze adaptive and maladaptive responses; contrast different alternative responses, and discuss outcomes.

Collaborating with the client in establishing realistic goals involves helping the client identify alternative solutions and develop realistic goals based on them. This collaboration facilitates real change and encourages further goal-setting behaviours. Design opportunities that result in success, reinforce the client's skills and strengths, and assist the client to obtain needed assistance. To assist the client in becoming committed to decisions and actions to achieve goals, teach the client to stop using ineffective coping mechanisms and develop successful coping strategies. Supporting attempts that are health

* BOX 25-10

FOCUS ON PRIMARY HEALTH CARE

Promoting Client's Self-Concept

The focus of primary health care is to promote health and prevent illness by stressing client education and self-care. Measures that contribute to a healthy self-concept and therefore promote health and well-being include those that support adaptation to stress, such as proper nutrition and regular exercise within the client's capabilities; those that facilitate adequate sleep and rest; and those that reduce stress.

Nurses are in a unique position to identify lifestyle practices that put a client's self-concept at risk or are suggestive of an altered self-concept. For example, a young adult visits a clinic with complaints of being unable to sleep and experiencing anxiety attacks. In gathering the health history, you may learn of lifestyle practices such as excessive use of alcohol or nonprescription drugs, too little rest, or a large number of life changes occurring simultaneously. These data, when taken together, may suggest actual or potential self-concept disturbances. In this situation, you determine how the client views the various lifestyle elements so that you can facilitate the client's insight into behaviours. If necessary, you provide needed health teaching or make appropriate referrals to other community services. Clients who are experiencing threats to or alterations in self-concept often benefit from mental health and community resources to promote increased awareness. Knowledge of available community resources enables you to make appropriate referrals.



BOX 25-11 CLIENT TEACHING

Alterations in Self-Concept

Objective

- Risks for situational low self-esteem will be reduced in the home care setting.

Teaching Strategies

- Reinforce the client's expression of thoughts and feelings; clarify meaning of verbal and nonverbal communication.
- Encourage opportunities for self-care.
- Elicit the client's perceptions of strengths and weaknesses.
- Convey verbally and behaviourally that the client is responsible for his or her own behaviour.
- Identify relevant stressors with the client, and ask for the client's appraisal of these stressors.
- Explore the client's adaptive and maladaptive coping responses to problems.
- Collaboratively identify alternative solutions; encourage the client to use alternatives not previously tried.
- Continue to reinforce the client's strengths and successes.

Evaluation

- Confirm the client's perception of and actual use of improved communication skills.
- Observe the client's level of participation in decisions that affect care.
- Confirm with the client and family that the increase in activities and tasks has been a positive experience.
- Observe the client's establishment of a simple routine.
- Observe the client take necessary action to change maladaptive coping responses and maintain adaptive responses.
- Confirm with the client and family how new coping resources can be applied to continued change.

Modified from Stuart, G. W., & Laraia, M. T. (2005). *Principles and practice of psychiatric nursing* (8th ed.). St Louis, MO: Mosby.

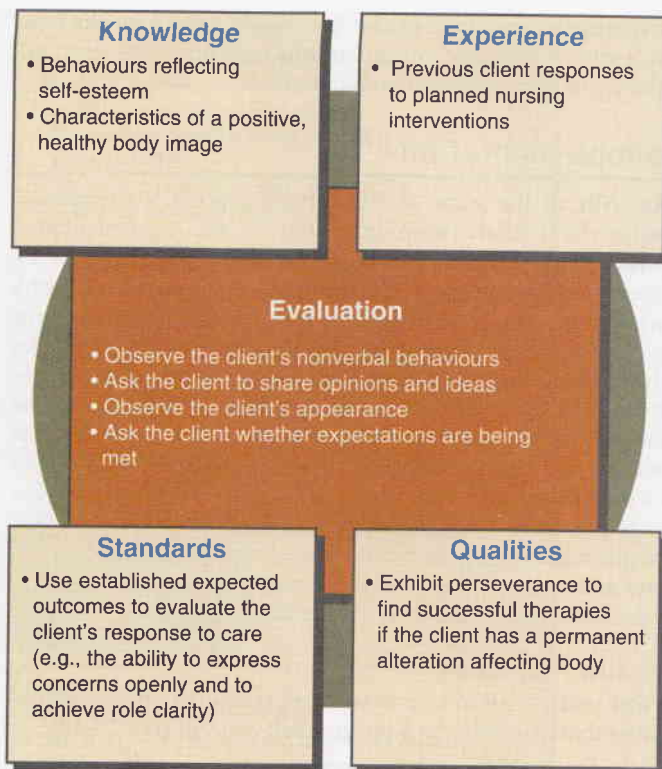


Figure 25-8 Critical thinking model for self-concept evaluation.

promoting is essential, because with each success, another attempt can be made. Supporting adaptive, flexible coping is crucial to help a client with an altered self-concept.

Establishing a therapeutic environment and a therapeutic relationship (see Chapter 17) and increasing self-awareness are also critical in successfully helping clients who have alterations in self-concept, whether care is focused on health promotion, dealing with an acute process, or addressing restorative care. To support a client in developing a positive self-concept, you must convey genuine caring (see Chapter 18) and establish a partnership with the client to address underlying problems.

❖ Evaluation

Client Care

Critical thinking is needed to evaluate success in meeting each client's goal and the established expected outcomes (Figure 25-8). Frequent evaluation of client progress is recommended so that changes can be instituted if necessary. You use knowledge of behaviours and characteristics of a healthy self-concept when you review the client's behaviours. This method determines whether outcomes have been met.

Expected outcomes for a client with a self-concept disturbance may include nonverbal behaviours indicating a positive

self-concept, statements of self-acceptance, and acceptance of change in appearance or function. Nonverbal behaviours can be key indicators of clients' self-concept. For example, a client who has had difficulty making eye contact may demonstrate a more positive self-concept by making more frequent eye contact. Social interaction, adequate self-care, acceptance of the use of prosthetic devices, and statements indicating understanding of teaching all indicate progress. A positive attitude toward rehabilitation and increased movement toward independence facilitate a return to preexisting roles at work or at home. Patterns of interacting can also reflect changes in self-concept. For example, a client who has been hesitant to express his or her views may more readily offer opinions and ideas as self-esteem increases. The goals of care may be unrealistic or inappropriate as the client's condition changes. The plan may need to be revised, to reflect on successful experiences with other clients. Client adaptation to major changes may take a year or longer, but such length is not suggestive of problems with adaptation. Look for signs that the client has reduced some stressors and that some behaviours have become more adaptive. Changes in self-concept take time. For some clients, the sense of hopelessness and helplessness may persist. Referral to other mental health specialists may be necessary.

Client Expectations

If you have a good rapport with the client, the client may be able to share how things are going from his or her perspective. You may be able to facilitate this sharing by initiating a review of what has happened over time. This offers the opportunity to share perceptions and encourages clients to consider and voice how they have conceptualized any changes.

❖ KEY CONCEPTS

- Self-concept is an integrated set of conscious and unconscious attitudes and perceptions about the self.
- Components of self-concept are identity, body image, and role performance.
- Each developmental stage involves factors that are important to developing a healthy, positive self-concept.
- Identity is particularly vulnerable during adolescence.
- Body image is the mental picture of a person's own body and is not necessarily consistent with a person's actual body structure or appearance.
- Body image stressors include changes in physical appearance, structure, or functioning that are caused by normal developmental changes or illness.
- Self-esteem is the emotional appraisal of self-concept and reflects the overall sense of being capable, worthwhile, and competent.
- Self-esteem stressors include developmental and relationship changes, illness (particularly chronic illness involving changes in what were normal activities), surgery, accidents, and the responses of other individuals to changes resulting from these events.
- Role stressors, including role conflict, role ambiguity, and role strain, may originate in unclear or conflicting role expectations and may be aggravated by illness.
- Your self-concept and nursing actions can have an effect on a client's self-concept.
- Planning and implementing nursing interventions for self-concept disturbance involve increasing the client's self-awareness, encouraging self-exploration, aiding in self-evaluation, helping formulate goals for adaptation, and assisting the client in achieving those goals.

❖ CRITICAL THINKING EXERCISES

1. You are assigned to care for a 23-year-old Chinese Canadian client who sustained multiple fractures to his face and femur four days ago in a motor vehicle accident. He had surgery the evening of admission to repair his femur but was admitted to wait for surgery to his face. The client lives with his girlfriend and their seven-month-old daughter and works as a janitor in the local university. He left China with his mother when he was a young child and has grown up in Canada. You have been with him for most of the morning. He was given an analgesic for his pain. His pain rating decreased from 6 to 3 on a scale of 0 to 10, but the morphine left him drowsy. During the morning, he shared with you some of his concerns about when he will be able to return to work. You are in the room when the surgeon tells him about his upcoming surgery. A temporary tracheotomy is planned because of the extensive surgery needed in the nasal and throat area. After the surgeon leaves, the client tells you that he does not want the tracheotomy. He indicates that he is unclear about what it actually entails, even though the surgeon explained it in fairly simple terms. He states, "I just want to get back to normal." How would you address this comment and his lack of understanding regarding the tracheotomy?
2. A 16-year-old girl is preparing for discharge from the hospital after giving birth a day earlier. She is unmarried, is uninvolved with the baby's father, and has minimal support from her family to help her care for her newborn. Before admission, she arranged to give the baby up for adoption. She reaffirms this as a good decision because she will be able to return to school

and still graduate with her peers. The client confides in you that her biggest concerns right now are how she feels about herself and how she looks. Taking into account the developmental needs of this adolescent, how will you collaborate with her to establish priority interventions to address her self-concept difficulties?

3. As a part of your community health experience, you are assigned to visit a 75-year-old woman who has gone to live with her daughter after being hospitalized for agitation and aggression secondary to Alzheimer's disease. When you go to their home, you find the 55-year-old daughter tearful. She says, "I just don't know if I can do this. She is so confused. She calls me two or three times a night but often doesn't recognize me when I come to her. I've been missing a lot of work. Even when I'm there, I'm not as productive because I'm so tired." What additional assessment data would be important to gather? What provisional nursing diagnosis could be made for the daughter?

❖ REVIEW QUESTIONS

1. When a nurse is caring for a client after mastectomy, interventions to promote physiological stability and pain control are necessary. What other nursing interventions would the nurse need to develop?
 1. Interventions to improve the client's mobility
 2. Interventions to improve the client's self-concept
 3. Interventions to improve the client's activity tolerance
 4. Interventions to improve the client's ability to perform self-care activities
2. Which of the following ages are associated with the self-concept developmental task of developing self through modelling, imitation, and socialization?
 1. 0 to 1 year
 2. 1 to 3 years
 3. 3 to 6 years
 4. 6 to 12 years
3. Which of the following involves the internal sense of individuality, wholeness, and consistency of a person over time and in various circumstances?
 1. Body image
 2. Self-concept
 3. Role performance
 4. Identity
4. Adolescents are at risk for body image disturbance. Which of the following is an accurate statement about body image?
 1. Body image is not influenced by the opinions of others.
 2. Body image refers to the external features of a person.
 3. Body image includes actual and perceived perceptions of one's body.
 4. Physical changes during adolescence are quickly incorporated into the person's body image.
5. What is the name of the process when certain behaviours become common or are avoided, depending on whether they are approved and reinforced or are discouraged and punished?
 1. Reinforcement-extinction
 2. Inhibition
 3. Substitution
 4. Identification

6. What is the name of the process when an individual internalizes the beliefs, behaviour, and values of role models into a personal, unique expression of self?
 1. Reinforcement-extinction
 2. Inhibition
 3. Substitution
 4. Identification
7. What age group is particularly vulnerable to stressors that can affect an individual's identity because that age is a time of great change?
 1. Infants
 2. Children
 3. Adolescents
 4. Adults
8. What is the possible outcome when a person does not maintain a clear, consistent, and continuous consciousness of personal identity?
 1. Identity confusion
 2. Low self-esteem
 3. Low self-concept
 4. Body image difficulties
9. What is the nurse assessing for when she or he asks the client, "How do you feel about yourself?"
 1. Identity
 2. Body image
 3. Self-esteem
 4. Role performance

10. Which of the following would help increase a client's self-awareness?
 1. Establishing a trusting nurse-client relationship that allows the client to explore his or her thoughts and feelings
 2. Accepting the client's thoughts and feelings
 3. Helping the client to define his or her problems clearly
 4. Having the client identify his or her positive and negative coping mechanisms

+ RECOMMENDED WEB SITES

Canadian Mental Health Association: Children and Self-Esteem: http://www.cmha.ca/bins/content_page.asp?cid=2-29-68

This Web page offers advice about how to promote positive self-esteem in children.

The Canadian Women's Health Network: Body Image and the Media: <http://www.cwhn.ca/resources/faq/biMedia.html>

This site contains a discussion of the impact of the media on body image, and it provides advice to help young women have a healthy body image.

Statistics Canada: Adolescent Self-Concept and Health Into Adulthood: <http://www.statcan.gc.ca/pub/82-003-s/2003000/pdf/82-003-s2003005-eng.pdf>

In this report, published in 2003, factors associated with adolescent self-concept are examined, and the effect of adolescent self-concept on later health and health-related behaviour in young adulthood is described.

Review Question Answers

1. 2; 2. 2; 3. 4; 4. 3; 5. 1; 6. 4; 7. 3; 8. 1; 9. 3; 10. 1

Rationales for the Review Questions appear at the end of the book.

Sexuality

Original chapter by Kathy Lever, MSN, WHNP-C

Canadian content written by Anne Katz, RN, PhD

objectives

Mastery of content in this chapter will enable you to:

- Define the key terms listed.
- Discuss the nurse's role in maintaining or enhancing a patient's sexual health.
- Discuss the complexities of sexual identity, gender identity, and sexual orientation.
- Describe key concepts of sexual development across the lifespan.
- Describe the sexual response cycle.
- Identify high-risk and safer sex behaviours.
- Identify common sexually transmitted infections (STIs).
- Identify major types of sexual dysfunction and potential causes.
- Assess a patient's sexuality.
- Define appropriate nursing diagnoses for patients with alterations in sexuality.
- Identify and describe nursing interventions to promote sexual health.
- Evaluate a patient's sexual health.
- Identify potential referral resources for patients' sexual concerns outside the nurse's level of expertise.
- Use critical thinking skills to assist patients in meeting their sexual needs.

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- Audio Chapter Summaries
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media resources

key terms

- | | |
|----------------------------|--|
| Bisexuality, p. 416 | Sexual health, p. 415 |
| Contraception, p. 421 | Sexual identity, p. 416 |
| Dyspareunia, p. 417 | Sexual orientation, p. 416 |
| Gender identity, p. 416 | Sexual response cycle, p. 418 |
| Heterosexuality, p. 416 | Sexuality, p. 415 |
| Homophobia, p. 416 | Sexually transmitted infections (STIs), p. 416 |
| Homosexuality, p. 416 | Transsexuality, p. 416 |
| Infertility, p. 423 | Vasodilation, p. 418 |
| Safer sex, p. 421 | |
| Sexual dysfunction, p. 424 | |

Sexuality and its expression are vital elements to the wholeness we feel as human beings. **Sexuality** is seen as “a central aspect of being human throughout life and encompasses sex, gender, identities and roles, sexual orientation, eroticism, pleasure, intimacy, and reproduction” (Wagner et al., 2005). People's view of themselves and others as sexual beings is influenced by their cultural, ethnic, and religious beliefs and practices. Sexuality also concerns people's sexual relationships with others and how they are perceived by others (van der Riet, 1998). Sexual functioning is seen as what people *do* as sexual beings; it is thought to consist of the four phases of the sexual response cycle as conceived by Masters and Johnson (1966; Barton et al., 2004). Sexual functioning, according to this definition, is the same as sexual behaviour; sexual dysfunction is thought to occur when behaviour does not follow some predetermined path and is seen as wrong or abnormal or necessitating intervention.

The World Health Organization (2004) defined **sexual health** as “a state of physical, emotional, mental and social well-being related to sexuality; it is not merely the absence of disease, dysfunction or infirmity. Sexual health requires a positive and respectful approach to sexuality and sexual relationships, as well as to the possibility of having pleasurable and safe sexual experiences, free of coercion, discrimination and violence. For sexual health

to be attained and maintained, the sexual rights of all persons must be respected, protected and fulfilled.”

Nurses have a role in the promotion of positive, healthful sexuality for youth, adolescents, young and middle-aged adults, and older adults. Nurses can also educate patients to help prevent adverse outcomes such as unwanted pregnancy, **sexually transmitted infections (STIs)**, or sexual dysfunction (Health Canada, 2008).

Religious teachings, culturally prescribed gender roles, beliefs about sexual orientation, and social and environmental climates influence both the patient's and the health care provider's value systems. You need to explore your own beliefs and prejudices and strive to develop a nonjudgemental and caring approach that integrates sexual health care into everyday practice.

Scientific Knowledge Base

To assist patients in meeting their sexual needs, you must have a sound scientific knowledge base about sexual and gender identity, sexual orientation, sexual development, the sexual response cycle, high-risk and safer sex behaviours, STIs, contraception, and abortion.

Sexual and Gender Identity

Sexual identity is the objective labelling of a person as male or female. Most people would probably say that two sexes exist and that sexual identification is fairly straightforward. Conventional wisdom is that a person's genitalia determine whether the person is male or female (Vilain, 2004). According to the XY sex-determination system, the two sex chromosomes are the same in female humans (XX) and different in male humans (XY). However, people do not always fit neatly within these systems of sexual identification. Variations in genitalia, gonads, chromosomes, or hormones occur in an estimated 17 of 1000 births in Canada (Johnson, 2004). For example, some people are born with ambiguous genitalia, which makes determining the sex of the infant difficult. Several genetic conditions can disrupt development of the fetus in such a way that the baby is neither fully male nor fully female (Liao, 2003). A child with an **androgen disorder** may have male-appearing genitalia and might **genetically** be a girl; another child might have male hormones and the external appearance of a girl.

Gender identity is the degree to which a person identifies as male, female, or some combination. It begins in early childhood as the child becomes aware of the differences of the sexes and perceives that he or she is male or female. Gender identity is usually consistent with physical sex at birth; however, this is not always the case. For example, in **transsexuality**, the physical body is incongruous with the gender identity. A transsexual person may have a female body but feel like a man or may have a male body but feel like a woman (Johnson, 2004). Current research findings indicate that gender identity disorder is caused by hormonal fluctuations at a crucial time in fetal development (Society for Human Sexuality, 2004). Many transsexual people choose to undergo sex reassignment so that their physical sex is congruent with their gender identity; this process involves surgery and the administration of hormones.

Sexual Orientation

Sexual orientation describes the predominant gender preference of a person's sexual attraction over time. **Heterosexuality**

is sexual preference for members of the opposite sex; **homosexuality** is sexual preference for members of the same sex. **Bisexuality** is an equal or almost equal preference for both sexes. In a recent Statistics Canada (2008) survey, 1.9% of Canadians aged 18 to 59 (2.1% of men and 1.7% of women) identified themselves as gay or lesbian, and about 0.9% of respondents identified themselves as bisexual. As a nurse, you must not assume that you know your patients' gender identity or sexual orientation. Anyone could be lesbian, gay, bisexual, transsexual, or heterosexual. If you learn a patient's sexual orientation, you should not assume that you may tell anyone else or include it in the medical record without the patient's knowledge. Some people might want to keep their sexual orientation confidential.

Earlier thinking about sexual orientation led many to believe that heterosexuality was normal and mentally healthy and that all other orientations were abnormal or signs of a psychological disorder. Today, this theory is summarily rejected; scientists agree that homosexuality, transsexuality, and bisexuality are not disorders and are not associated with mental illness or abnormal psychological functioning. Nevertheless, **homophobia**—the prejudicial treatment of or negative attitudes about lesbian, gay, bisexual, or transsexual people and those who are perceived to have these gender or sexual identities—still exists. Homophobia can include a range of emotions and behaviour from discomfort, fear, and disgust to hatred and violence. If you are nonjudgemental and equipped with an appropriate knowledge base, you can help address the problems of homophobia and provide nursing care that does not discriminate against the patient's sexual orientation.

Sexual Development

As a person grows and develops, so does his or her sexuality. Each stage of development brings changes in sexual functioning and in the role of sexuality in relationships.

Infancy and Childhood. The awareness of one's sexual identity and sexual development begins in infancy, when attitudes about the physical body are communicated by caregivers (Haroian, 2000). From birth on, children are treated differently according to their gender. The differential treatment shapes the behaviour of the child. During the school years, children expand their horizons from parents and family. Parents, teachers, and the child's peer group serve as role models and teach about how men and women act and relate with each other. School-aged children generally have questions regarding physical and emotional aspects of sex (Finan, 1997). They need accurate information from home and school about physical and emotional changes during this period and what to expect as they move into puberty. This knowledge may help decrease anxieties as changes begin to happen. An uninformed child may be frightened by menstruation or nocturnal emission and view them as evidence of a dreadful disease.

Puberty and Adolescence. Puberty is characterized by the development of secondary sex characteristics; in girls, these changes generally begin between the ages of 8 and 11 years. The first signs are usually the development of breast buds and, later, growth of pubic hair. The labia begin to enlarge, as do the internal reproductive organs. Sometime after the tenth year, the girl may experience her first menstrual period, and her body shape takes on a more womanly form. By the time she has her period, the breasts are usually fully developed, and pubic hair and axillary (underarm) hair are present. Over time, the menstrual cycle ordinarily becomes regular.



Figure 26-1 Adolescents function within a powerful network of peers as they explore their sexual and gender identity.

In boys, the changes usually occur about a year later. In some boys, starting at about age nine years, the testicles begin to enlarge, and the skin of the scrotum becomes darker and coarser. Pubic hair appears and the boy grows taller and more muscular. Genital growth continues over the next two years, and the boy begins to look like a male adult, with broad shoulders and narrow hips. When the larynx enlarges, the voice begins to deepen. Fine facial hair and axillary hair also begin to grow. Over time, pubic hair becomes coarser, and penile growth starts to slow down; the testicles continue to grow until they reach full size. Many boys between the ages of 15 and 19 years experience ejaculation, either spontaneously at night (nocturnal emission) or as a result of masturbation. By the end of puberty, the young man is close to his adult height, but further growth can occur into the third decade.

This is a developmental period in which social and emotional changes are also significant. Peer group attachments are strong; sexual attraction to other people is common (Figure 26-1). These emotional and social changes do not always keep up with the physical changes; as a result, an adolescent may look like an adult but still acts and thinks like a child. Perception of body image is important through this stage. Many adolescents are very unhappy with the way they look. They may constantly compare themselves with their peers or with images in the media, and they may consequently experience great dissatisfaction. Self-esteem may be affected negatively; low self-esteem may result in dangerous social and sexual behaviours. Cognitive changes that occur during adolescence are the ability to think in an abstract manner and to anticipate potential consequences (Duncan et al., 2003). These changes are useful in view of the physical and emotional changes.

It is the norm for youth, rather than the exception, to experiment sexually and often with multiple partners (Beitz, 1998); thus, it is essential that youth have access to sexual health services, including information on topics such as body changes, sexual health promotion, STIs, contraception, and pregnancy. Such services are designed to promote sexual health and to encourage responsible decision making with regard to sexual behaviour.

Public health care providers have been alarmed by the trend toward greater sexual activity at increasingly younger ages, particularly because of the adverse consequences. In 1998 in Canada, 21,000 girls between 15 and 19 years of age had elective abortions, and almost 20,000 girls of that age group

gave birth; these statistics translate into a rate of 19.8 births for every 1000 girls (Canadian Institute of Health Information, 2004). After teenage pregnancy, mothers and their children often experience health, financial, and social problems (Jewell et al., 2000). Similarly, exposure to STIs and unwanted sexual activity can lead to psychological disturbances, impairments in the development of healthy social and interpersonal relationships, and long-term physical health problems.

You may be most effective in your goals to support teenagers by helping parents develop confidence in educating their children about sexuality. Factual information regarding sexuality and sexual activity is important, but equally or perhaps more important is guidance in establishing a personal value or belief system to use as a framework for decision making. In healthy family networks, much of this guidance is conveyed in the course of child-rearing. Parents need to understand the importance of providing information, sharing their values, and promoting sound decision-making skills. Parents and significant others need to be counselled that even with the best guidance and information, adolescents will make their own decisions and must be held accountable for those decisions.

Adolescence is often a time when individuals explore their primary sexual orientation. Some teenagers may recognize their preference as distinctly homosexual, which can be frightening and confusing. Support for the adolescent's sexual identity is important during this time and can come from a variety of sources, such as school counsellors, clergy, family, and health care providers.

Adulthood. Adults have matured physically but continue to explore and define emotional maturation in relationships. Intimacy and sexuality are issues for all adults of all sexual orientations, whether they are in a sexual relationship, choose to abstain from sex, are single, are widowed, are divorced—whatever circumstances arise. People can be sexually healthy in numerous ways.

As sexually active adults develop intimate relationships, they need to learn techniques of stimulation that are satisfying to both themselves and their sexual partners. Some adults may need confirmation that alternative ways of sexual expression other than penile-vaginal intercourse are normal. Other individuals may require significant education or therapy to achieve mutually satisfying sexual relationships.

Through middle adulthood, physical changes can affect sexual functioning. Decreasing levels of estrogen in perimenopausal women (during the years leading up to menopause) and menopausal women (after menstruation has ceased) may result in diminished vaginal lubrication and decreased vaginal elasticity. Both of these changes may lead to **dyspareunia**, which is painful intercourse. Declining levels of testosterone result in decreased desire for sexual activity. Suggestions such as using vaginal lubrication and creating time for caressing and tenderness can help patients adjust to normal changes related to aging.

As men age, they are likely to experience an increase in the post-ejaculatory refractory period, delayed ejaculation, and erectile dysfunction. Advising patients of these normal changes related to aging can ease concerns regarding functioning. Aging adults may also need to adjust to the effects of chronic illness, medications, aches, pains, and other health concerns that affect sexuality.

Older Adulthood. As people age, some shift their priority from genital sex to other ways of expressing sexual desire. Activities that promote affection, romance, intimacy, and

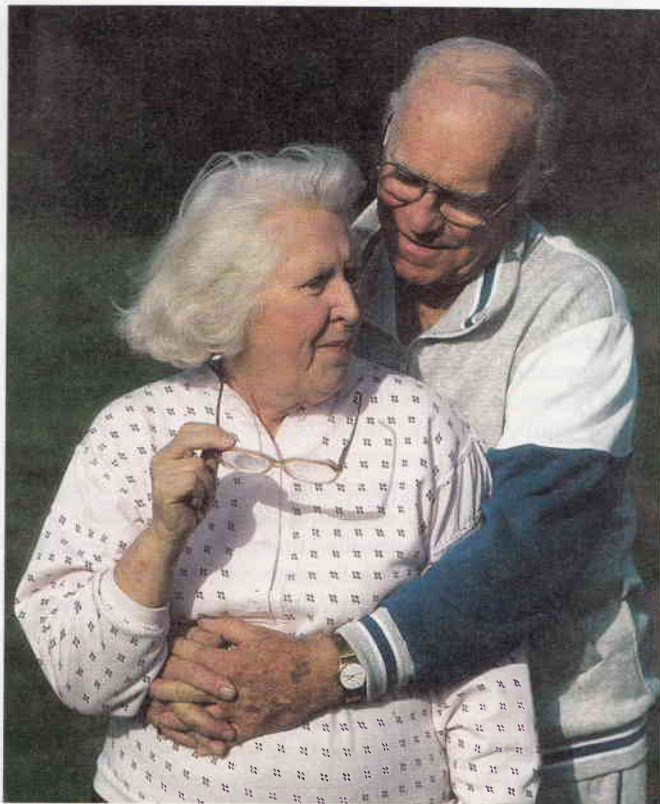


Figure 26-2 Intimacy and affection are important to older adults. **Source:** From Sorrentino, S. A. (2004). *Mosby's Canadian textbook for the support worker* (p. 166). Toronto: Elsevier.

companionship may be enough to satisfy the sexual needs of some older adults (Figure 26-2). However, not all older adults experience a decline in interest in sex. The majority of people have the capacity to stay sexually active into very late life and regard sexual activity as important to their overall well-being and quality of life (Gott, 2001). Aging does, however, affect sexual functioning (Box 26-1). The accompanying psychological and physical transitions require flexibility in thinking and adjustment to the changes; people who successfully manage the transition are poised for emotional and sexual satisfaction (Palacios et al., 2002). Having a healthy attitude to sexuality, as well as maintaining good physical health, will maximize potential for ongoing sexual health in old age (Ginsberg, 2006).

Sexual Response Cycle. Masters and Johnson (1966) developed a four-stage model explaining the human **sexual response cycle**. The model suggested that major similarities exist between men and women. The four stages of the model are excitement, plateau, orgasm, and resolution, and they represent episodes of **vasocongestion** (swelling of tissues) and muscle contractions.

In the **excitement** stage, the heart rate and blood pressure increase, and blood flows into the sexual organs. In women, the breasts enlarge in size, and a reddish flush may be seen over the upper torso. The nipples become more erect. Increased blood flow to the genitalia results in enlargement of the clitoris; engorgement of the labia majora, which flatten and spread outward; and swelling of the labia minora. The upper two-thirds of the vagina enlarge, and the vaginal walls thicken. The

* BOX 26-1 RESEARCH HIGHLIGHT

Gender Issues and Sexual Desire: The Role of Emotional and Relationship Issues

This study assessed the differences between men and women regarding the role of emotional and relationship factors and sexual desire.



Research Focus

Sexual desire is often seen as a precursor to sexual activity, and relationship and emotional factors are not often taken into account. This research is important because sexual desire does not usually occur in a vacuum but rather in the context of the relationship among partnered people.

Research Abstract

Carvalho and Nobre (2010) gave 250 men and 237 women a number of questionnaires that measured emotions, partner adjustment, psychopathology and frequency of sexual desire. These participants were all from the general population and did not disclose any sexual problems prior to the study. Findings indicate that women have greater emotional hurt during sexual activity than men do but men experienced more fear and shame than women. Those with low desire scored lower on the partner adjustment scale as well as experiencing higher levels of disillusion. Those with higher desire experienced greater satisfaction. The researchers concluded that when clinicians work with couples experiencing low desire in one or both, couple adjustment and emotions during sexual activity are important to consider.

Evidence-Informed Practice

- Men and women experience different emotions related to sexual desire.
- Clinicians must consider social and cultural factors when assessing for problems related to sexual desire.
- Both men and women experience greater satisfaction with the relationship when levels of sexual desire are high.

Reference: Carvalho, J., & Nobre, P. (2010). Gender issues and sexual desire: The role of emotional and relationship issues. *Journal of Sexual Medicine*, 7, 2469–2478. doi:1111/j.1743-6109.2009.01689.x.

vaginal walls also secrete a fluid that allows for penile penetration. In men, the penis becomes erect as blood flows into the spongy tissues. The skin of the scrotum thickens, and the testicles swell; the scrotum elevates, and the testicles move in toward the body.

The **plateau** phase is a state of advanced arousal. Blood pressure and heart rate continue to increase, and breathing may become rapid. In women, the lower third of the vagina (at the entry to the vagina) swells. The upper vagina continues to expand, and the uterus moves into an upright position. The labia minora become more engorged with blood and become a darker colour. The clitoris shortens and withdraws below the clitoral hood. The breasts continue to increase in size. In men, the testicles continue to enlarge. The head or glans of the penis changes to a deeper colour.

Orgasm is the phase of significant muscular contractions. During this phase, respiration and heart rates peak, and subjective feelings of intense pleasure radiate through the body. Most of the major muscles in the body contract and may go into spasm. In women, the pelvic muscles contract between 3

and 15 times. The muscles of the anal sphincter and the uterus itself contract. Orgasm in the male occurs in two stages; in the first phase, seminal fluid is forced into the bulb of the penis by contractions of the vas deferens, the two seminal vesicles, the ejaculatory ducts, and the prostate gland. The bladder neck closes off to prevent urine from mixing with the semen. The second stage of orgasm for the man occurs when the muscles around the urethra contract and fluid is propelled along the urethra and out of the urethral meatus. These contractions are accompanied by subjective feelings of intense pleasure.

In the *resolution* phase, vasocongestion diminishes, and the rest of the body returns to its normal state: muscle tension is reduced within minutes, and heart rate, blood pressure, and respiration rate return to normal. During this phase in women, blood flow to the pelvic organs is reduced. The breasts return to their normal size, and flushing of the skin disappears. In men, the penis loses its rigidity, and the testicles and scrotum shrink in size. In men, this phase is followed by a refractory period during which orgasm and ejaculation are physiologically impossible. In young men, the refractory period may last a few minutes, but as men age, this period lasts longer, and older men may not be able to have another orgasm or ejaculation for many hours or even days. Women do not experience a refractory period; they may have multiple orgasms with continued stimulation.

Kaplan (1979) introduced the idea of desire in her description of the human sexual response cycle. Her model comprised three parts: desire, excitement, and orgasm. In Kaplan's model, emotion and cognition, which lead to the subjective feeling of desire, are an important part of sexual response. Excitement and orgasm in this model is as described in Masters and Johnson's (1966) model. Kaplan did not include resolution in her model; she suggested that the cycle has three independent phases. Also, according to this model, it is possible to experience excitement without having experienced desire first.

Basson (2005) more recently described an alternative model of the female sexual response cycle. It relied heavily on psychoemotional processes, as opposed to the more physiological basis of Masters and Johnson's (1966) and Kaplan's (1979) models. In her model, desire (or *libido*) is thought to occur at a variety of points in the sexual response cycle. The female sexual response cycle is conceptualized as a circular rather than linear process, as described in the two previous models. Basson suggested that women rely on different reasons to be receptive to or instigators of sexual activity; rewards such as emotional intimacy, feelings of well-being, and lack of negative feelings resulting from avoiding sex are all factors that may cause a woman to feel desire. With varied motivations for sexual activity, women respond to sexual stimuli from a partner. When the woman receives these stimuli, they are processed psychologically and physically; this may then lead to subjective feelings of arousal and a responsive feeling of desire. Sexual satisfaction is thought to further increase motivation and willingness to be receptive at a future time. Basson reasoned that satisfaction does not necessarily mean orgasm; she suggested that for many women, feelings of closeness and intimacy and the partner's satisfaction may be enough to cause satisfaction for the woman.

Sexual Behaviour

Sexual behaviour typically comprises the broad array of sexual activities people participate in, such as masturbation, hugging, kissing, manual stimulation of a partner, vaginal or anal

penetration, oral-genital stimulation, oral-anal stimulation, sexual excitement while looking at erotica, and telephone or "cyber" sex (Bernhard, 2002; Engender Health, 2004). It is difficult to define "normal" and "abnormal" because wide variation exists between cultures and at different times in society. An inclusive attitude is that whatever people find pleasurable is "normal" as long as it occurs between consenting adults who engage in sexual behaviour by choice, in a safe environment where rules and boundaries are negotiated and respected.

High-Risk Sexual Behaviour. Because body fluids can be transferred between partners, unprotected sex can result in pregnancy or the transmission of STIs. **Safer sex** refers to sexual activities that present minimal or reduced risk for disease transmission or unintended pregnancy. Unsafe sex refers to activities through which risk for infection, unintended pregnancy, or injury is decreased. Unsafe sex includes anal-penile or vaginal-penile intercourse without a condom (Society for Human Sexuality, 2004). Without the use of barriers such as condoms or latex dental dams, penile-anal intercourse is probably the riskiest activity, followed by penile-vaginal intercourse, oral-anal sex, and oral-genital sex.

The dynamics of sexual risk taking are not fully understood, but numerous studies have revealed that drug and alcohol use are highly correlated with sexual abuse and unsafe sex (Keller et al., 1996; Kenney et al., 1998). Adolescents, especially, tend to have a sense of being invincible, believing that unwanted pregnancy, STIs, and other negative outcomes of sexual behaviour are not likely to happen to them (Ross et al., 2000).

Sexually Transmitted Infections

A number of STIs are of concern to public health officials and health care providers. In Canada, health officials report increases in all of the infections that, by law, must be reported, including chlamydia, gonorrhea, and syphilis (Public Health Agency of Canada, 2004).

A major problem in dealing with STIs is finding and treating the people who have them. Because symptoms may be absent or go unnoticed, some people may not even know that they are infected. Sexual behaviour may include the whole body rather than just the genitalia; therefore, many parts of the body are potential sites for an STI. The mouth, tongue, and throat are commonly used for sexual pleasure. The vagina, perineum, anus, and rectum are also frequently included in sexual activity. Furthermore, any contact with another person's body fluids near an open lesion on the skin, anus, or genitalia can result in transmission of an STI.

Sometimes people do not seek treatment because they are embarrassed to discuss sexual symptoms or concerns. They may also hesitate to talk about their sexual behaviour if they believe that it is not "normal." This hesitation to seek help often hinders the detection of an STI.

Syphilis. Syphilis, a bacterial infection, can be transmitted through oral, vaginal-penile, or anal sex with an infected person. A pregnant woman with syphilis can pass it on to her baby, which can lead to birth defects or death in the baby. Syphilis also can be transmitted through injection drug use or through broken skin or sores, although transmission by these routes is not common. Syphilis can be diagnosed with a simple blood test and is easily treated with antibiotics. If it is not treated, syphilis can affect the brain, blood vessels, heart, and bones. It can also cause death. Males older than 30 years account for the majority of syphilis cases in Canada (Public

Health Agency of Canada, 2004), and local outbreaks are reported periodically across the country.

Chlamydia. The most common of all bacterial STIs, chlamydial infection may cause an abnormal genital discharge and burning with urination; however, it is often asymptomatic. It is treated by an antibiotic.

Chlamydia produces many serious complications in women. If undetected and thus untreated, it can progress to pelvic inflammatory disease in women, a very painful and sometimes debilitating disease that is linked to infertility. An untreated chlamydial infection may cause scarring of the uterine tubes, which increases the risk for ectopic pregnancy and infertility. Research findings suggest that chlamydial infection is also a risk factor for the transmission of the human immune deficiency virus (HIV), and it could be a risk factor for cervical cancer (Anttila et al., 2001). It is estimated that fewer than 10% of chlamydial infections are diagnosed and treated (Public Health Agency of Canada, 2004). Women, particularly those younger than 30 years, are most affected; women account for two-thirds of all reported chlamydia cases in Canada (Public Health Agency of Canada, 2004).

Gonorrhea. Gonorrhea is easily transmitted during vaginal-penile intercourse, anal-penile intercourse, and oral sex (Birley et al., 2002). It can affect the penis, cervix, rectum or anus, throat, and eyes. Pain during sex or during urination, or unusual discharge, may be indications of a gonorrheal infection. Gonorrhea must be treated with antibiotics. If left untreated, it may cause serious health problems, including infertility. It can also cause blood, joint, and eye infections in a baby born to an infected woman (Planned Parenthood Federation of America, 2008b). Gonorrhea is the second most commonly reported bacterial STI in Canada, and its prevalence is also increasing. Men aged 20 to 29 years are the most affected age group in Canada. Of the cases among women, 70% occur in those aged 15 to 24 years. Antibiotic-resistant strains of the bacterium are becoming a problem in some regions of Canada (Public Health Agency of Canada, 2004).

Human Papillomavirus. Human papillomavirus (HPV) is not required to be reported, although it is a very serious STI. It is strongly linked with cervical cancer (Division of STD Prevention and Control, 2000). It may be manifested as external genital warts that occur on the penis, scrotum, perineum, vulva, and perianal area; they usually appear as small, hard, painless bumps. These warts can also occur in the vagina, on the cervix, inside the urethra, and inside the anus (Beutner et al., 1998). If untreated, they may grow and develop a fleshy, cauliflowerlike appearance. Because they are caused by a virus, genital warts cannot be cured. They are treated with a topical drug (applied to the skin), by freezing, or, if they recur, with injections of medication. If the warts are very large, they can be removed surgically. A preventive vaccine for HPV has been approved; it offers protection against four HPV types, which together cause 70% of cervical cancers and 90% of genital warts (Centers for Disease Control and Prevention, 2008). The recommendation is that girls and women between the ages of 9 and 26 be offered this vaccine; it is important that the vaccine be given before the initiation of sexual activity. Women who are sexually active may receive the vaccine but, because they may have already been exposed to some strains of HPV, are less likely to benefit. The HPV vaccine has also been shown to be effective in men (Giuliano et al., 2011), and Health Canada has approved its use in men aged 9 to 26 years.

HPV is also associated with development of oral cancer, and the incidence of this cancer among young adults aged 20

to 39 is rising. HPV subtypes 16 and 18 are most often associated with oral cancer, and the virus is readily spread through mucosal contact (Kreimer et al., 2005). This connection is not widely known among the public. Physicians and dentists may not ask about oral sex, and their index of suspicion for oral cancer in young adults may be low (Brondani et al., 2010).

Genital Herpes. Genital herpes, caused by the herpes simplex virus, is the most common manifestation of genital ulceration and is often transmitted by people who have no visible or symptomatic lesions (Public Health Agency of Canada, 2004). Genital herpes can cause extensive ulceration (painful blisters or open sores), with severe pain. Without treatment, episodes can last for three or more weeks, and many people with herpes have recurrent episodes. At present, the viral infection is incurable; antiviral drugs can only control the symptoms and suppress transmission.

Human Immunodeficiency Virus Infection. HIV is the virus that causes acquired immune deficiency syndrome (AIDS). Essentially, HIV destroys the body's ability to defend against infection. Many people do not have symptoms when they first are infected with HIV, although some may have a flulike illness within one to two weeks after exposure. More persistent or severe symptoms may not appear for 10 years or more after infection. During the asymptomatic period, however, the virus is actively multiplying, infecting, and killing cells of the immune system. As the immune system weakens, various complications occur (National Institute of Allergy and Infectious Diseases, 2003).

AIDS represents the most advanced stages of HIV infection. The syndrome can result in many infections that do not usually affect healthy people. In people with AIDS, these infections are often severe and sometimes fatal. People with AIDS are particularly prone to developing cancers, especially those caused by viruses (such as Kaposi's sarcoma or cervical cancer) and those of the immune system (such as lymphomas).

In an infected person, HIV is present in the majority of body fluids. For transmission to occur, therefore, some exchange of body fluid, particularly blood, must occur. Primary routes of transmission include contaminated intravenous needles, unprotected sexual activity (anal intercourse, vaginal intercourse, and oral-genital sex), and transfusion of blood and blood products. HIV can also be spread from infected mothers to their babies during pregnancy, at birth, or during breastfeeding. HIV has not been proved to be transmitted through sweat, tears, saliva, or urine.

By the end of 2004, it was estimated that 57,674 positive results of HIV tests were confirmed in Canada and reported to the Public Health Agency of Canada. Rates of infection are highest in men who have sex with men, in Aboriginal people, in injection drug users, and in immigrants from countries where HIV is endemic (Centre for Infectious Disease Prevention and Control, 2003). Women account for 25% of all HIV infections in Canada (Public Health Agency of Canada, 2004). Many Canadians who are currently infected with HIV do not know that they are.

Although medications enable individuals with HIV to stay healthy longer, and although they help prevent the transmission of HIV from a pregnant woman to her newborn, medications cannot cure the disease (McIlhaney, 2000).

Prevention of Sexually Transmitted Infections. People most likely to be infected with an STI are those who have unprotected sex. Exposure to multiple partners or to a sexual partner who has many partners increases the risk of acquiring an STI. Injection drug users are also a high-risk

group because they share blood by sharing needles. Primary prevention of STIs starts with changing the sexual behaviour that heightens the risk for infection. Health promotion must be targeted toward high-risk groups and must emphasize education and counselling regarding safer sexual behaviour. STIs often occur together, and screening is usually performed for all STIs at the same time.

Safer Sex. *Safer sex* refers to the sexual practices and behaviour that reduce the risk of contracting and transmitting STIs, especially HIV. When a partner is infected or when the infection status of a partner is not known, it is crucial to practise safer sex. For vaginal-penile and penile-anal intercourse, partners should use condoms. Safer sex practices are also necessary for oral sex; if one of the partners is a woman, a thin piece of rubber, a latex dental dam, a female condom, or an unlubricated male condom cut open to form a flat piece of latex should be placed between the other partner's mouth and the woman's vulva before any oral contact is made. Male partners should cover their penis with an unlubricated condom before any oral contact is made (Engender Health, 2004).

Using Condoms. Condoms were originally sold to promote birth control. However, when used correctly, they also provide protection against STIs. A condom acts as a barrier to keep blood, semen, and vaginal fluids from passing from one person to another. In Canada, condoms are free at many public health clinics and readily available from drugstores and supermarkets. Condoms can be made from latex, polyurethane, or natural membranes such as sheepskin or lambskin. Latex and polyurethane condoms reduce the risk of most STIs (including HIV) and help protect against pregnancy. Natural membrane condoms do not protect against STIs because some bacteria and viruses can pass through small pores in the material (Centre for Infectious Disease Prevention and Control, 2002).

A female condom is a strong, soft, clear sheath made of polyurethane with two rings at either end. It is placed inside the vagina before sex and protects against pregnancy and STIs (including HIV). When placed correctly, one end covers the cervix and the other end covers part of the external genitalia (Planned Parenthood Federation of America, 2008a).

Contraception

Contraception is a crucial facet of sexual health to avoid unwanted pregnancies. Some forms of contraception require a health care provider's intervention: hormonal contraceptives (e.g., birth control pills or patch, injectable contraceptives), intrauterine devices (IUDs), the diaphragm, the vaginal contraceptive ring, and the cervical cap. Surgical procedures that provide permanent contraception are also available to men (vasectomy) and women (tubal ligation). Other forms of contraception do not require a prescription or intervention from a health care provider: condoms, contraceptive sponges, vaginal spermicides, and fertility awareness methods (i.e., timing of intercourse in relation to the menstrual cycle). Table 26-1 summarizes some of the contraceptive choices available.

Effective contraception involves factors relating to the sexually active couple, the method of contraception, the couple's understanding of the contraceptive method, the consistency of contraceptive use, and the compliance with the requirements of the chosen method. Personal characteristics that have been identified as positively influencing contraceptive use include motivation to avoid unplanned pregnancy, ability to plan, comfort with sexuality, and previous contraceptive use (Running & Berndt, 2003). Cultural and religious background

may permit certain practices and prohibit others. For example, the teachings of the Roman Catholic Church prohibit the use of contraception except for the fertility awareness method.

Emergency Contraception. Emergency contraception pills (ECPs, or "morning after" pills) can prevent a woman from becoming pregnant after unprotected vaginal-penile sex. ECPs are most effective up to 72 hours after intercourse, and the sooner they are taken, the more effective they are (Public Health Agency of Canada, 2006). They are recommended to women when contraception was not used, when a condom broke, when a diaphragm slipped, when a birth control injection was given over one week late, when two or more birth control pills were missed, or in cases of rape. When hormonal ECPs are taken within 72 hours (three days) after unprotected sex, the risk of getting pregnant is reduced by approximately 75%. ECPs have been shown to be effective up to five days after intercourse.

Women can obtain ECPs from family physicians, nurse practitioners and midwives, hospital emergency rooms, or walk-in clinics. As of 2005, Canadian pharmacists may dispense ECPs without a physician's prescription; however, pharmacists have the right to refuse to do so if it conflicts with their personal beliefs. ECPs are available for free or at minimum cost at many university health services, sexual health clinics, birth control clinics, Planned Parenthood clinics, and women's health clinics. Adolescent girls do not require parental consent to obtain ECPs, and no medical examination is required.

Abortion

Since 1988, Canada has been one of the few countries without any legal restrictions on abortion. Canada has no requirements for waiting periods, parental or spousal consent, gestational limits, or restrictions on types of elective abortion. Abortion is also a safe procedure, especially if performed within the first trimester of pregnancy. Some provinces fully fund all elective abortions; others fund only those performed in hospitals. However, access to abortion services is often a problem for women living outside major cities. Two-thirds of abortions are performed in hospitals; the remainder are performed in abortion clinics and health centres. However, only 18% of hospitals across the nation provide abortions (Canadian Abortion Rights Action League, 2003). In Prince Edward Island and Nunavut, no hospitals provide abortions.

Abortion continues to be a hotly debated issue. Women and their partners faced with an unwanted pregnancy may consider an elective abortion. As a nurse, you can provide an environment in which the issue of abortion can be discussed openly and various options with an unwanted pregnancy can be explored. You should discuss religious, social, and personal issues in a nonjudgemental manner with patients. Reasons for choosing an elective abortion vary and may include terminating an unwanted pregnancy or aborting a fetus known to have abnormalities. When abortion is chosen as a way of dealing with an unwanted pregnancy, the woman, and often her partner, may experience a sense of loss, grief, or guilt, or a combination of these. Guilt may surface immediately, or it may be more covert and manifest as sexual dysfunction.

Health care providers must reflect on their own personal values related to abortion. The health care provider is entitled to personal views and should not be forced to participate in counselling or procedures contrary to beliefs and values. Nurses should choose specialties or places of employment in which their personal values are not compromised and the health care that a patient needs is not jeopardized.

► TABLE 26-1 Available Contraceptives

Type	Effectiveness	Description
Male condom	86%–97%	A thin, skin-tight sheath placed on an erect penis to stop sperm from entering a partner's body. Water-based lubricants can make them more comfortable, increase sensation, and reduce the risk of breakage.
Female condom	79%–85%	A lubricated pouch that is placed in the vagina before penile insertion; it stops sperm from entering the woman's body. It may break or slip, and some women may have difficulty placing it correctly.
Birth control pills	98%–99%	Pills taken every day that contain a low dose of hormones (estrogen and progestin or progestin alone). The ovaries are prevented from releasing an egg for fertilization, eggs are prevented from implanting, and the mucus around the cervix is thickened, which makes entry of the sperm more difficult. They are available only by prescription.
Cervical cap	80%–91%	A small, flexible cup that is inserted into the vagina before penile insertion. It covers the cervix and prevents sperm from entering the uterus. The caps are available in different sizes; proper fitting by a trained health care provider is required.
Intrauterine device (IUD)	99%	A small piece of plastic or copper that is inserted into the uterus by a physician. Sperm is prevented from fertilizing an egg, or, if an egg is fertilized, the egg is prevented from implanting in the uterus. Some IUDs also release hormones to prevent pregnancy. IUDs can stay in place for 1–8 years.
Birth control patch	99.2%–99.4%	A thin, 2 cm × 2 cm patch that can be worn on the lower abdomen, buttock, upper arm, or upper torso. The patch is applied once a week for 3 consecutive weeks; the fourth week is patch free. The mechanism of action is the same as that of oral contraceptives.
Injectable contraceptive	99.70%	Progestin is injected into a woman's arm or buttocks once every 12 weeks. The hormone prevents the ovaries from releasing eggs. A physician or nurse administers the injections.
Vaginal contraceptive ring	98.3%–99.4%	A soft, flexible, transparent ring that is self-inserted into the vagina and delivers hormones over 3 weeks, after which time the ring is removed for 1 week. A new ring is then inserted.
Contraceptive sponge	80%–91%	A soft sponge that is filled with spermicide and placed in the vagina before vaginal-penile intercourse. It is effective for 24 hours after placement. The sponge must be kept in place for 6 hours after intercourse.
Vaginal spermicides	78%–90%	Gels, films, and suppositories, which contain a spermicidal agent, that are inserted into the vagina before vaginal-penile intercourse. The agent kills sperm and acts as a physical barrier to prevent any surviving sperm cells from entering the cervix. This approach may be used by women who are at low risk for STIs and whose partners are at low risk.
Fertility awareness method	90%–98%	A woman can monitor her fertility patterns and know, on the basis of daily observations of body temperature and cervical mucus, when she is most likely and least likely to conceive. She must abstain from vaginal-penile intercourse when she is most likely to conceive. This method can also be used to achieve pregnancy.
Tubal ligation	99.50%	A surgical procedure in which a woman's uterine tubes are tied into a loop and then cut. This procedure is performed with the woman under general anaesthesia, and its effects should be considered permanent.
Vasectomy	99.90%	A minor surgical procedure for men in which the vas deferens that carry the sperm are cut, "tied," cauterized, or otherwise interrupted. The semen no longer contains sperm after the tubes are cut, and conception cannot occur. The procedure can be performed in a physician's office with a local anaesthetic. The results of this procedure should be considered permanent.

Adapted from Planned Parenthood Federation of Canada. (2004). *Contraception*. Retrieved from <http://www.ppf.ca/ppfc/content.asp?articleid=248>; and from Pettinato, A., & Emans, S. J. (2003). New contraceptive methods: Update 2003. *Current Opinion in Pediatrics*, 15, 362–369.

Nursing Knowledge Base

In planning to help patients address sexual needs, you should use critical thinking skills and basic nursing knowledge. You may draw from the following areas of nursing knowledge: sociocultural dimensions of sexuality; how to discuss sexual issues; alterations in sexual health (infertility, sexual abuse, sexual dysfunction); and conditions that create sexual health concerns (pregnancy, surgery, illness, disability).

Sociocultural Dimensions of Sexuality

Sexuality is influenced by cultural rules and norms that determine which behaviour is acceptable within the culture. Society

plays a powerful role in shaping sexual values and attitudes and in supporting specific expression of sexuality in its members. Each cultural and social group has its own set of rules and norms that guide the behaviour of its members. These rules become an integral part of an individual's thinking and underlie sexual behaviour; they include, for example, how people find partners, their choices of partners, how they relate to one another, how often they have sex, and what they do when they have sex.

It is widely suggested that nurses include information about sexual health and the implications for sexuality when they care for patients. Nurses should also routinely ask patients whether they have any sexual concerns related to their

condition or treatments (Albaugh & Kellog-Spadt, 2003). However, this question is frequently omitted, and a valuable opportunity to be proactive and holistic in the care provided is thus missed (Haboubi & Lincoln, 2003). You may feel that asking about sexuality is an invasion of patients' privacy (Bartlik et al., 2005), or you may think that gender is a barrier (Burd et al., 2006). Nurses appear to be more likely to wait for the patient to initiate the discussion than to assess this routinely (Guthrie, 1999). You may think that the patient does not expect you to ask questions about this (Magnan et al., 2005), or you may believe that it is the physician's responsibility (Herson et al., 1999). As a result, sexual problems may not be recognized and thus may be ignored. Some nurses may presume that because of the seriousness of the patient's disease or because of the patient's stage of life, sexuality is not an important issue (Huang, 1999); this presumption can have consequences such as lack of education for the patient.

Discussing Sexual Issues

Sexuality is a significant part of each person's being; however, sexual assessment and interventions are not always included in health care. The area of sexuality can be emotionally charged for nurses as well as for patients. Discomfort with talking about sexual issues, lack of information, and differences between a patient's values and the nurse's values may prevent the nurse from discussing issues of sexuality with patients. The most valuable tool that you can develop for providing care in areas of sexuality is effective, nonjudgemental communication. If you have difficulty discussing topics related to sexuality, you should understand why, and you should develop a plan for addressing your discomfort.

Discussing matters of a sexual nature can also be embarrassing for patients. Often, patients do not mention sexual health issues; they may worry about looking stupid, using incorrect words, or being offensive, or they may simply have no way of describing their concerns. It is crucial that you be comfortable in asking questions about sexuality and in responding to issues that arise from such questioning. By using a perceptive and educated approach to talking about sexuality, you can offer the support that many patients require.

Effective communication about sexuality requires caring, sensitivity, tact, compassion, the use of appropriate language, and nondiscriminatory attitudes. When talking with patients about sexuality, it is important not to have preconceived notions about their sexual identity or activity. Homosexual and bisexual people may not receive adequate health care if health care providers assume heterosexual sexual orientation and fail to obtain complete sexual histories. Older adults' sexual health may also be overlooked if health care providers stereotype these patients as asexual.

Alterations in Sexual Health

Infertility. Infertility is the inability of a couple to conceive after one year of unprotected intercourse. A couple who wants to conceive and cannot may experience a sense of failure and feel that their bodies are somehow defective. Infertility may become an emotionally draining facet of their lives, and the treatments also affect their sexual lives and relationship. With advances in reproductive technology, infertile couples face many choices, some of which involve challenges to their religious and ethical values and may cause financial strain.

Choices for the infertile couple include medical assistance with fertilization, adoption, or exploring the possibility of

remaining childless. Infertility support groups can provide couples with emotional and educational help. For example, the Infertility Awareness Association of Canada, a national support group for couples with infertility, can be helpful in offering educational resources and assistance.

Sexual Abuse. Sexual abuse is a widespread health problem. Abuse crosses all gender, socioeconomic, age, and ethnic groups. Most often, this abuse is perpetrated by a former intimate partner or by a family member. Sexual abuse has far-ranging effects on physical and psychological functioning (Dickinson et al., 1999). Increasingly, sexual abuse is occurring through the Internet: sexual predators recruit victims on social networking sites and then arrange to meet the victims, after which the abuse begins.

Evidence of sexual abuse in children may be uncovered during history taking or physical examination (see Chapter 31). Symptoms that should raise suspicion of sexual abuse include a child showing an early, exaggerated awareness of sex or exhibiting seductive behaviour toward adults; swelling or bruising of the external genitalia, anus, breasts, or buttocks; lacerations of or a foreign substance in the vagina or anus; and an STI in a child younger than 15 years. In Canada, nurses are required by law to report suspected child abuse to child protection authorities. Signs and symptoms of sexual abuse are listed in Box 26-2.

When sexual abuse is recognized, support needs to be mobilized for the victim and the family. All family members may require therapy in situations of incest to promote healthy interactions and relationships. Rape victims may need to come to terms with the crisis before feeling comfortable with intimate expressions of affection. The victim's partner may need

► BOX 26-2

Signs and Symptoms That May Indicate Current or Previous Sexual Abuse

- Irritation or injury (such as cuts and bruises or scarring) of the thighs, perineum, or breasts
- Trauma to mouth and throat, including petechiae of the oral cavity
- Oral STIs
- Intense fear of bathing or perineal care
- Vaginal discharge, genital odour, and painful urination
- Difficulty walking or sitting
- Avoidance of casual touching
- Sleep pattern disturbances
- Nightmares
- Depression
- Anxiety
- Decreased self-esteem
- Difficulties with intimate relationships
- Substance abuse
- Frequent visits to health care providers
- Headaches
- Gastrointestinal problems
- Eating disorders
- Abdominal pain
- Vaginal pain
- Dysmenorrhea

Adapted from Bohn, D., & Holz, K. (1996). Sequelae of abuse: Health effects of childhood sexual abuse, domestic battering, and rape. *Journal of Nurse-Midwifery*, 41(6), 442.

► TABLE 26-2 Types of Sexual Dysfunction

Category	Type*	Definition
Sexual desire disorders	Hypoactive sexual desire disorder	Persistent or recurrent deficiency or absence of sexual fantasies and desire for sexual activity
	Sexual aversion disorder	Persistent or recurrent extreme aversion to, and avoidance of, all or almost all genital sexual contact with a sexual partner
Sexual arousal disorders	Female sexual arousal disorder	Failure in a woman to attain or maintain the lubrication-swelling response or to experience a subjective sense of sexual excitement and pleasure during sexual activity
Male erectile dysfunction		Persistent or recurrent inability to attain an adequate erection or to maintain an adequate erection until completion of the sexual activity
Orgasmic disorders	Female orgasmic disorder (anorgasmia)	The recurrent and persistent inhibition of the female orgasm, as manifested by the absence or delay of orgasm after a period of sexual excitement the clinician judges adequate in intensity and duration to produce such a response
	Male orgasmic disorder (retarded ejaculation)	Persistent or recurrent delay in, or absence of, orgasm after a normal sexual excitement phase during sexual activity that the clinician, taking into account the man's age, judges to be adequate in focus, intensity, and duration
	Male orgasmic disorder (premature ejaculation)	Persistent or recurrent ejaculation with minimal sexual stimulation before, upon, or shortly after penetration and before the man wishes it
Sexual pain disorders	Dyspareunia	Recurrent or persistent genital pain in either a man or a woman before, during, or after sexual intercourse that is not associated with vaginismus or with lack of lubrication
	Vaginismus	An involuntary constriction of the outer third of the vagina that prevents penile insertion and intercourse
Sexual dysfunction resulting from drug use or diseases		Sexual dysfunction judged to be caused by the direct physiological effects of a general medical condition or use of a substance

*According to American Psychiatric Association. (In press). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.

support in understanding this process and ways to assist the victim. Children who have been sexually abused need to understand that they are not at fault for the incident. The parents must understand that their response is critical to how the child reacts and adapts. You may come in contact with patients confronting these stressors. You are in an ideal position to assess occurrences of sexual violence and to educate individuals about community services. You should be aware of resources for referral and support in the community.

Sexual Dysfunction. Sexual dysfunction is a common, complex problem that arises because of biological, psychological, and interpersonal factors (Table 26-2). Sexual problems and dysfunction are often associated with health problems such as heart disease, diabetes, cancer, and mental illness. It is not known how many people experience sexual dysfunction, and it is most probably a minority who seek help. Researchers estimate that between 10% and 52% of men and 25% and 63% of women have sexual problems, although the prevalence of sexual dysfunctions that meet the diagnostic criteria of the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association, in press) is lower (Heiman, 2002). For most people, sexual dysfunction is perplexing and emotionally disturbing, and it adversely affects their primary relationship.

Sexual dysfunction can usually be treated with either medical interventions (mostly pharmacological) or psychological interventions (e.g., cognitive and behavioural methods). The aim is typically to achieve changes in physical (genital response, orgasms) or subjective (greater desire, ease of orgasm) responses (Heiman, 2002).

Sexual Dysfunction in Women. Loss of sexual desire is the most common reason that women seek help for sexual

dysfunction (Butcher, 1999a). Despite considerable research, sexual desire is poorly understood. Medical conditions (including depression), stress, and fatigue affect sexual desire. Painful intercourse is another common sexual dysfunction in women. Recurring sexual pain can produce a cycle in which trepidation because of previous pain leads to avoidance of the sexual activity that produced it, which leads to lack of arousal, failure to achieve orgasm, and loss of sexual desire (Butcher, 1999b). This cycle can evolve to avoidance of sexual activity altogether.

Sexual Dysfunction in Men. One of the most common types of sexual dysfunction for men is erectile dysfunction. It is estimated that about 27% of sexually active Canadian men experience erectile dysfunction, which is the repeated inability to achieve or maintain an erection (Auld & Brock, 2002). Erectile dysfunction can be caused by any health problem, including heart disease, hypertension (or its treatment), diseases of the prostate, diabetes mellitus, multiple sclerosis, and depression. Indeed, erectile dysfunction might be a warning sign of undiagnosed cardiovascular disease.

Patients With Particular Sexual Health Concerns

Pregnant and Postpartum Women. Female sexual interest tends to fluctuate during pregnancy; it increases during the second trimester and often decreases during the first and third trimesters. The decrease in libido during the first trimester may be caused by nausea, fatigue, and breast tenderness. During the second trimester, blood flow to the pelvic area is increased to supply the placenta, and sexual enjoyment and libido accordingly increase. During the third trimester, increased abdominal size may make finding a comfortable position difficult.

The most prevalent sexual problem during pregnancy is fear of harming the fetus. However, pregnancy and birth complications are not associated with sexual intercourse (von Sydow, 1999). If women have a history of miscarriages or premature labour, they may be advised to avoid sexual intercourse during the later months of pregnancy. Other restrictions such as no orgasms or no sexual arousal may be necessary to protect high-risk pregnancies (Mayo Foundation for Medical Education and Research, 2004).

Patients Recovering From Surgery. Surgeries that result in disfigurement, especially of the face, breasts, genitalia, and reproductive organs, frequently have harmful effects on a patient's self-image and sexuality (de Marquiegui & Huish, 1999). The effects of surgery, whether temporary or permanent, are often not fully anticipated and may not be fully manifested until after discharge from the hospital. Patients' partners might also have adjustments to make and may find it difficult to resume sexual activity. Coping with anxiety, fear, or depression about the surgery is essential. You need to support patients to discuss their concerns, especially sexual anxieties, because problems can become deep-rooted, complicated, and more difficult to resolve over time (de Marquiegui & Huish, 1999). Patients who have had ileostomies, colostomies, or urostomies are particularly concerned about possible loss of control, unpleasant smells or sounds, seepage or broken bags, and their partners' responses (see Chapter 44). Perioperative counselling and support are essential for these patients.

Patients With Illness or Disabilities. Illness and disability often affect sexual health. During periods of illness, individuals may experience major physical changes, the effects of drugs or treatments, the emotional stress of a prognosis, concern about future functioning, and separation from significant others. Situational stressors could include a heart attack (myocardial infarction); cancer diagnosis and treatment; or chronic disease such as diabetes, multiple sclerosis, or Parkinson's disease. You should not assume, because of a patient's age or severity of prognosis, that sexual functioning is not a concern. In some instances, patients may wrongly believe that their condition prohibits sexual activity, or they may need some guidance to promote satisfactory sexual functioning (Nusbaum et al., 2003).

Many myths are prevalent about people with a disability, including the idea that they are asexual or somehow different. Without doubt, long-term disability can have profound effects on a person's sense of sexuality and sexual function. Congenital or birth impairments commonly affect sexual development; for example, the resulting lack of privacy and independence may mean that people with disabilities miss out on typical sexual experiences (Glass & Soni, 1999). Acquired disabilities may have different implications: impairments sustained in youth may bring about low social and sexual confidence, and people who sustain disabilities as adults may be far more aware of what they have lost. It is important that health care providers validate a disabled person's sexuality. You can do this by sensitively initiating conversations about sexual function and safer sex practices.

Critical Thinking

Successful critical thinking requires synthesis of knowledge, experience, information gathered from patients, critical thinking qualities, and intellectual and professional standards. Clinical judgement requires you to anticipate the information

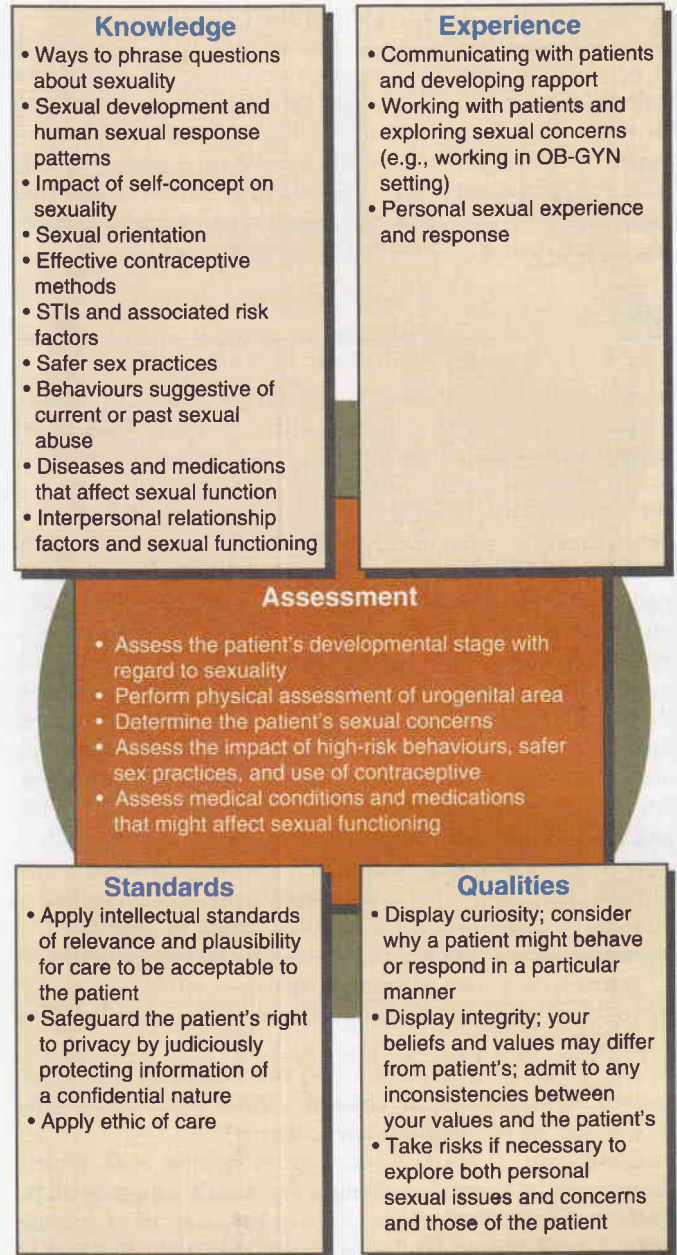


Figure 26-3 Critical thinking model for sexuality assessment. OB-GYN, Obstetrical-gynecological; STIs, sexually transmitted infections.

necessary, analyze the data, and make appropriate decisions regarding patient care. Figure 26-3 depicts numerous critical thinking elements, as well as patient assessment data, that contribute to appropriate nursing diagnoses.

In the case of sexuality, you integrate knowledge from nursing and other disciplines. You must have a good understanding, for example, of the human sexual response cycle, safer sex practices, and the taxonomy of sexual problems, as well as solutions to these, to anticipate how to assess a patient and then how to interpret findings. Previous experience in caring for patients whose sexuality becomes threatened helps you approach the next patient in a more reflective and helpful way. Patients may have customs and values different from yours. Professional standards call for you to respect each patient as an individual.

Sexuality and the Nursing Process

A person's sexuality has physical, psychological, social, and cultural elements. You must assess all relevant elements to determine a patient's sexual well-being. You should build a sound knowledge base and be willing to explore personal issues regarding sexuality. The nursing role in addressing sexual concerns can range from ongoing assessment to providing information to counselling to referral.

❖ Assessment

Factors Affecting Sexuality

In gathering a sexual history, you should consider physical, functional, relationship, lifestyle, and self-esteem factors that may influence sexual functioning.

Sexual Health History

When taking a health history, you should include a few questions related to sexual functioning to determine whether the patient has any sexual concerns. You can incorporate these questions in the review of systems and address them in a routine, matter-of-fact manner. It is important to ask these questions once you have established rapport with the patient; the sexual history is usually taken at the end of the general history. You need to understand the reasons for the questions and be able to provide these reasons to the patient on request. An opening statement such as "Sex is an important part of life and can be affected by our health status. To better understand your health, it is useful to know ..." is a possible introduction to these questions. Other questions for adults might include:

- How do you feel about the sexual aspects of your life?
- Have you noticed any changes in the way you feel about yourself (as a man, woman, husband, or wife)?
- How has your illness, medication, or surgery affected your sex life?
- It is not unusual for people with your condition to be experiencing some sexual changes. Have you noticed any changes, or do you have any concerns?

Conducting a sexual assessment of children and adolescents provides special challenges for health care providers. Common challenges include issues of language, of promoting normal development while not minimizing problems, and of screening for sexual concerns while not unduly alarming children. In addition, the sexual counselling of minors raises ethical and legal issues regarding the patient's rights to health care and education, on the one hand, and the parents' or guardian's right to supervise information, on the other. Use of an open, positive, interested disposition when introducing sexual questions is helpful. It is also helpful to inform parents that you are going to be discussing this in private with their child or teenager and that this is a normal part of the nursing assessment.

When caring for older adults, nurses may adjust their assessment approach. When gathering a sexual history, it is important to keep in mind that the older adult may have difficulty discussing intimate details with health care providers because of cultural and social norms for their age group. You have a responsibility to help maintain healthy sexuality of older adults by offering the opportunity to discuss any concerns or to seek information. Often, asking questions on the topic of sexuality in a comfortable, relaxed manner facilitates older adults' discussion of their sexual needs.

Because of the prevalence of domestic violence and sexual abuse, questions relating to abusive relationships can be important. Questions that address domestic violence or abuse should be addressed to the patient in private. A question such as "Are you in a relationship in which someone is hurting you?" may encourage a patient to reveal current or previous abuse. An additional question such as "Has anyone ever forced you to have sex that you did not wish to participate in?" may more specifically encourage the patient to discuss concerns. Recognizing both subjective and objective signs and symptoms of abuse can aid in recognition of this too-common problem (see Box 26-2). If a person identifies sex abuse as a current or past problem, appropriate referrals need to be made with the patient's permission.

While you document the sexual history of a patient, it is also helpful to explore the patient's use of contraceptives and safer sex practices as appropriate. Adolescents may respond to a comment that reassures them that having questions related to sexuality is normal. A lead-in could be "Many teenagers have questions about whether their bodies are developing at the right rate. Do you have any questions about sex or your body?"

Some individuals are too embarrassed or do not know how to ask questions about sexuality. If a patient makes a sexual joke or expresses concern about relations with his or her partner, he or she may have questions. Observing for and listening to concerns about sexuality takes practice. With experience, you develop skill in clarifying and paraphrasing to help patients express sexual concerns. By including sexuality in the health history, you acknowledge that sexuality is an important part of health and create an opportunity for the patient to discuss sexual concerns.

Physical Assessment

The physical examination is important in evaluating the cause of sexual concerns or problems; however, this is beyond the scope of the generalist nurse and more appropriate for the advanced practice nurse or physician. Talking about sexuality at the time of the genital examination is not appropriate and can be misconstrued by the patient in addition to making him or her feel uncomfortable. Discussions about sexuality are best held when the patient is fully clothed and sitting comfortably in a private room.

Patient Expectations

As in the case of any patient assessment, it is important to understand the patient's expectations regarding his or her care. Questions such as "What would you like to have happen in regard to [expressed concern]?" and "What initial steps might you take?" can help the person identify desired outcomes. It is important for the nurse to set aside personal views and not assume what a patient's expectations might be.

❖ Nursing Diagnosis

After completing an assessment and applying critical thought to the diagnostic process (Box 26-3), you select diagnoses applicable to the patient's needs. Possible nursing diagnoses related to sexual functioning (NANDA International, 2009) are:

- *Anxiety*
- *Ineffective coping*
- *Interrupted family processes*
- *Deficient knowledge (about contraception or STIs or both)*

BOX 26-3 NURSING DIAGNOSTIC PROCESS

Assessment Activities

Observe readiness to discuss sexual concerns through verbalization (e.g., "When can I return to life as normal?" or "There goes my love life") or behaviour (e.g., exhibitionism).

Ask patient and spouse about previous level and method of sexual expression (e.g., frequency, initiator).

Observe for affectionate behaviour (e.g., touching, hand holding, kissing).

In privacy, ask spouse about perceptions of patient's recovery and return to full functioning.

Observe for anxiety (e.g., hand wringing).

Defining Characteristics

Patient verbalizes concern that sexual activity may cause another myocardial infarction or death.

Patient's spouse exhibits reluctance to touch patient.

Spouse verbalizes concern that patient will need continuous care, attention, and protection.

Patient maintains eye contact, shifts position frequently.

Nursing Diagnosis

Ineffective sexuality patterns related to fear of recurrent myocardial infarction or death during intercourse.

- Sexual dysfunction
- Ineffective sexuality patterns
- Social isolation
- Risk for other-directed violence
- Risk for self-directed violence

Clues that may signal risk or an actual nursing diagnosis related to sexuality include a history of surgery involving the reproductive organs, changes in appearance, past or current physical or sexual abuse, chronic illness, and developmental milestones such as puberty or menopause. Before making nursing diagnoses related to sexual dysfunction, you must first assess anatomical, physiological, sociocultural, and situational issues thoroughly.

When making a nursing diagnosis in regard to sexuality, you must clarify with the patient that the defining characteristics do in fact exist and that the patient perceives a problem with regard to sexuality. Determining the etiological or contributing factors is important in order to focus effective planning and to select appropriate nursing interventions. For example, the nursing interventions appropriate for the nursing diagnosis *chronic low self-esteem* would be different from those

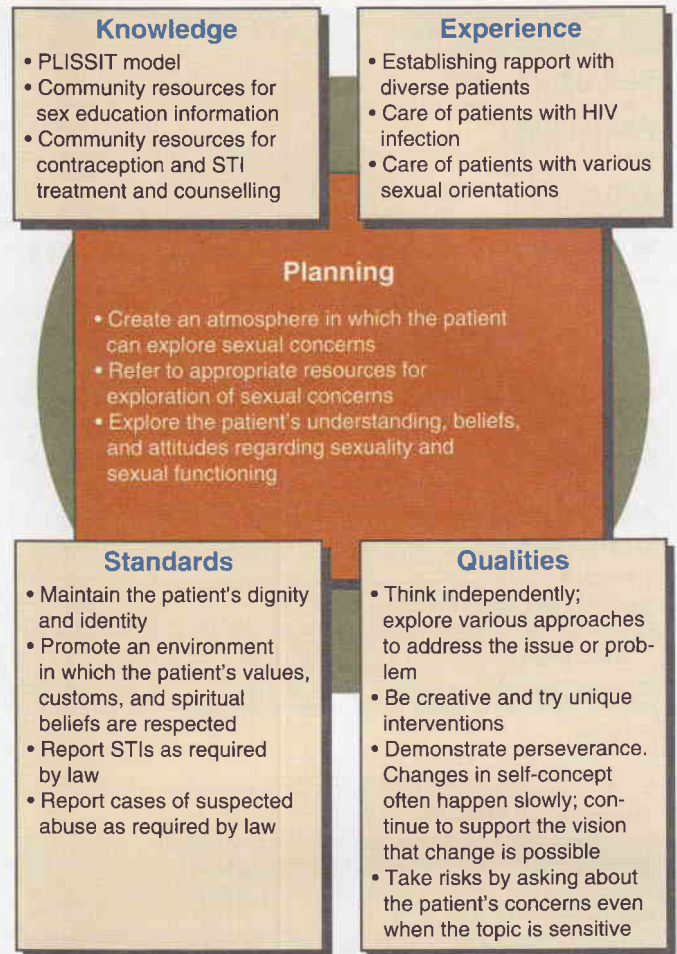


Figure 26-4 Critical thinking model for sexuality planning. HIV, Human immunodeficiency virus; PLISSIT, permission giving, limited information, specific suggestions, and intensive therapy; STI, sexually transmitted infection.

appropriate for other etiological factors. For *self-esteem disturbance related to chronic, recurring herpes infection*, the appropriate interventions include counselling and education on how to maintain safer sexual practices. In contrast, *self-esteem disturbance related to sexual abuse* would necessitate counselling and referral to community resources (e.g., crisis services or sexual abuse support group).

❖Planning

Goals and Outcomes

During planning, you again synthesize information from multiple resources (Figure 26-4). You use critical thinking skills to integrate professional standards and knowledge about the patient's sexuality into the care plan. It is especially important to maintain a patient's dignity and identity when you develop the care plan. For example, convey respect for a gay patient by including the help of a gay partner in the plan to the degree that the partner can assist the patient in maintaining his or her identity and dignity.

You develop an individualized care plan for each nursing diagnosis (Box 26-4). Together, you and the patient set realistic goals for care. Expected outcomes must be individualized and

► BOX 26-4 NURSING CARE PLAN

Sexual Dysfunction**Assessment**

Mr. Clements is a 46-year-old patient who was last seen in the office two months ago, when he was found to have mild hypertension and was given a prescription for propranolol (Inderal). His blood pressure today is 122/82 mm Hg.

Jack, a nursing student, talks with Mr. Clements after reading his records, which include the recent diagnosis of mild hypertension, the order for propranolol, and the current blood pressure reading of 122/82 mm Hg. The record also indicates that Mr. Clements is married and living with his wife.

Jack tells Mr. Clements of the improvement in his blood pressure since his last visit. He inquires whether Mr. Clements is taking his medication regularly. Mr. Clements reports that he has been taking his medication regularly. He relates that it scared him when his blood pressure was up because both his parents had died of strokes. Jack then inquires whether Mr. Clements has noted any side effects from the medicine. Mr. Clements says that he has not, except that he may be a little more tired than he used to be. Jack then states, "Some people find that certain blood pressure medications affect their sexual performance. Have you noticed any changes in sexual functioning since you began your medication?" Mr. Clements replies that he has had some problems achieving an erection since starting the medication.

Assessment Activities

Ascertain when Mr. Clements began noticing his inability to have an erection.

Ask Mr. Clements about his sexual relationship with his wife before taking propranolol.

Ask Mr. Clements whether he has noticed any changes in his desire for sex.

Ask Mr. Clements whether he has made any changes to his lifestyle since the first of the year.

Findings and Defining Characteristics

He responds that it was at about the same time he started taking propranolol.

He states they used to have intercourse one to three times per week.

He states that he has the same level of interest as before.

He denies any changes.

Nursing Diagnosis: Erectile dysfunction related to side effects of antihypertensive medication

Planning**Goal (Nursing Outcomes Classification)***

Patient will be able to achieve satisfactory erections.

Expected Outcomes**Sexual Functioning**

Patient will talk to his physician about this problem, and a change of medication may be warranted.

*Outcome classification label from Moorhead, S., Johnson, M., Maas, M. L., & Swanson, E. (Eds.). (2008). *Nursing outcomes classification (NOC)* (4th ed.). St Louis, MO: Mosby.

Interventions (Nursing Interventions Classification)[†]**Sexual Counseling**

Establish trust and respect with patient. Offer privacy during conversations.

Discuss possible effects of antihypertensive on sexual functioning, and encourage patient to discuss sexual concerns with physician.

Encourage patient to discuss concerns with his wife. Role-play so that patient can practise ways to approach concerns.

Rationale

Conveys sense of caring, increasing likelihood of patient's ability to express concerns fully (Ross et al., 2000)

Helps patient understand possible cause for sexual difficulties and gives patient important option to review with physician (Riley, 1999)

Many of the sexual problems in relationships involve poor communication (Finan, 1997)

Anxiety Reduction

Assure patient that other blood pressure medications are available to can maintain blood pressure control and that do not negatively affect sexual function.

Knowing that options exist and that blood pressure can continue to be safely managed gives patient sense of control (Running & Berndt, 2003)

[†]Intervention classification labels from Bulechek, G. M., Butcher, H. K., & Dochterman, J. M. (2008). *Nursing interventions classification (NIC)* (5th ed.). St Louis, MO: Mosby.

Evaluation**Nursing Actions**

At his next visit, ask Mr. Clements whether his problems have been resolved.

Patient Response and Finding

He responds that since he has been on new medication, he has had no trouble having an erection.

Achievement of Outcome

Mr. Clements reports sexual function with the new medication.

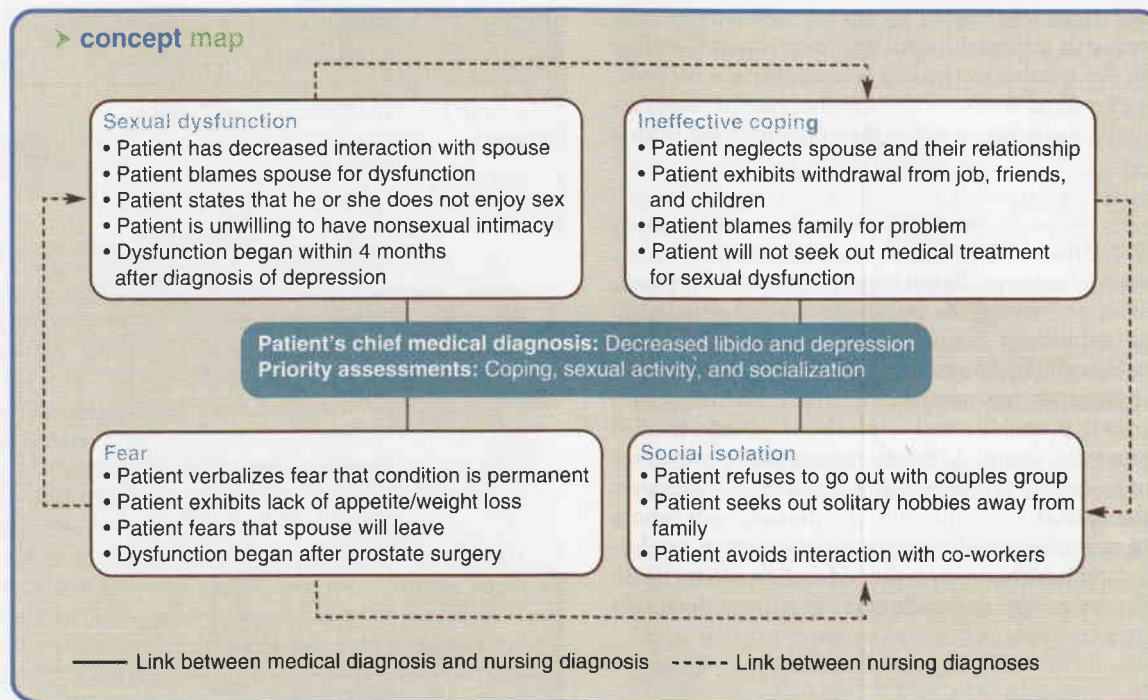


Figure 26-5 Concept map for patient with decreased libido and depression.

realistic. For example, for a patient with a nursing diagnosis of *sexual dysfunction related to dyspareunia*, you and the patient develop a goal to be free from pain or discomfort during sexual intercourse. Expected outcomes for this goal may be as follows:

- The patient will report decreased anxiety and greater satisfaction with sexual activity.
- The patient will consistently use a water-soluble lubricant with sexual intercourse.
- The patient will avoid the use of feminine hygiene products that destroy the natural flora and secretions of the vaginal walls.

A concept map is useful for organizing patient care (Figure 26-5). A concept map shows the relationship of a medical diagnosis (e.g., decreased libido and depression) with the four nursing diagnoses identified from the patient assessment data. The map also shows links and relationship with the nursing diagnosis. For example, ineffective coping affects and contributes to social isolation; as long as the patient has ineffective coping, social isolation continues or perhaps worsens.

Setting Priorities

A framework useful in guiding planning is the “PLISSIT” model developed by Annon (1976). In this model, levels of intervention are progressively more involved. *P* stands for “permission giving.” During assessment, you can bring up the topic of sexuality and give the individual permission to talk about sexual concerns. *LI* stands for “limited information,” which is basic information regarding sexuality and sexual functioning. An example is discussing nocturnal emissions with a prepubescent boy to minimize fear that might develop if the boy did not know this was a normal part of development. *SS* stands for “specific suggestions”: in this case, specific suggestions regarding a sexual concern or issue. For example, a postmenopausal woman might be concerned about her lack of vaginal lubrication, and you might suggest use of a

BOX 26-5

Community Resources Relating to Sexuality

Planned Parenthood
Sex therapists
Clinical psychologists
Social workers
Health department (often for both family planning and treatment of STIs)
Groups that provide education and services for those with particular conditions include the following:

- Canadian Diabetes Association
- Heart and Stroke Foundation of Canada
- Muscular Dystrophy Canada
- Sexual abuse support groups
- Women’s shelters (for those who have been physically abused, sexually abused, or both)
- Hotlines for help (which have lists of community support resources)

water-based lubricant during sexual intercourse. If you are not equipped to address a particular concern, you should refer the patient to another qualified health care provider. *IT* stands for “intensive therapy.” At this level of intervention, your role is to refer the patient to a qualified practitioner, such as a social worker or sexuality counsellor, for individualized therapy. The level of intervention that you plan depends in part on your own experience and knowledge. When a patient requires specific suggestions or intensive therapy, you may recommend referral to a specialist.

Continuity of Care

Planning in the area of sexuality may include referrals to community resources (Box 26-5). Sexual conflicts in marriage or

trauma related to sexual abuse or incest may necessitate intensive treatment with a mental health care provider or certified sex therapist. For women in abusive relationships, most communities have battered women's shelters that provide counseling and serve as a safe haven while they plan for their future.

❖ Implementation

Health Promotion

Because of their education, clinical expertise, and wellness orientation, nurses are among the professionals best situated to develop and implement sexual health initiatives. You can promote sexual health by identifying patients at increased risk, providing appropriate information, helping individuals gain insight into their problems, and exploring methods to deal with problems effectively. A health promotion perspective ought to guide nurses in designing a number of programs: informal educational opportunities, continuing education, peer learning activities for adolescents, community and political initiatives, and health care provider education (Beitz, 1998). Topics for education vary, depending on the nursing diagnosis (Box 26-6).

Acute Care

In general, nursing interventions that address alterations in sexuality are aimed at raising awareness, assisting in clarification of issues or concerns, providing information, or performing a combination of these. Nurses who have pursued specialized education in sexual functioning and counselling may provide more intensive sex therapy. You should recognize when an individual's needs exceed your expertise, in which case you should provide appropriate referral.

In the initial intervention, you often explore current sexual practices of the patient. The patient should be encouraged to investigate and acknowledge social and ethical values and consider the role of sexuality in his or her self-concept. When significant discrepancy exists between values and past or current practices, the patient may need referral for more intensive counselling.

Major developmental milestones (e.g., puberty or menopause) should prompt education about potential effects on sexuality. Situational crises such as a life change with pregnancy, illness, extreme financial stress, placement of a spouse in a long-term care facility, or loss and grief affect sexuality. Effects may last for days, months, or years and can generate performance anxieties that lead to continued sexual dysfunction. If an individual is prepared for possible changes in sexual functioning, performance anxieties may be minimized.

When concerns are assessed and identified, they can be addressed in the context of the patient's value system. In response to identified concerns, you may initiate discussion in pertinent areas. It may be appropriate to discuss sexual practices such as oral-genital sex or mutual masturbation as methods of expressing intimate affection when vaginal-penile intercourse is contraindicated. A partner experiencing musculoskeletal problems that cause joint pain, muscle spasms, stiffness, or problems with flexibility or mobility may appreciate a discussion of various positions for intercourse. Pillows placed about the body or under joints may reduce pain during sexual activity. Additional relief may be obtained by taking a warm shower or bath before sexual activity or using a waterbed to minimize pressure on painful joints (Nusbaum et al., 2003). Use of fantasy or a sense of playfulness may add new

* BOX 26-6

FOCUS ON PRIMARY HEALTH CARE

Sexual Health Education Topics

- Guidelines for normal development: For example, you might talk to a toddler's mother about preparing the toddler for a new baby, to a school-aged child about the appearance of pubic hair, or to a 60-year-old man about erectile difficulties. Details of physiological changes should be described as a part of general health care. Providing patient education gives permission for a patient to raise questions or concerns regarding personal functioning.
- Contraception, when talking with a patient of child-bearing age: The discussion should include such topics as the desire for children, usual sexual practices, acceptable methods of contraception, frequency of sexual activity, comfort with genital touching, comfort with sharing contraceptive responsibility with the partner, and comfort with interruption of sexual acts. You might ask, "Are you using contraceptives with your partner now?" and then follow up, on the basis of the patient's answer. For a patient who does not have a regular contraceptive method, does not have a reliable contraceptive method, or is not satisfied with the current method, the various methods of contraception should be reviewed to provide necessary information for an informed choice. The best method is the one that the patient will use consistently.
- Safer sex practices, when talking with a sexually active adolescent, with a patient who has more than one sex partner, or with a patient whose partner has multiple sexual partners: You should provide information regarding STI symptoms and transmission, use of condoms, and risky sexual activities (e.g., trauma from penile-anal sex). A topic to consider in discussing sexual relating is the emotional risks within a relationship. Role-play can be a useful educational tool for helping a person learn to say no or negotiate with a partner to use a condom.
- The need for regular physical examinations: Regular health examinations are important for maintaining sexual health. The annual health examination also provides an easy opportunity to discuss contraception and safer sex practices. Regular clinical breast examinations, mammography, and Papanicolaou (Pap) smears are important for women, as are testicular self-examinations for men.



romance or stimulation to a long-term relationship. A couple may need confirmation or assurance that the acting out of nonharmful fantasy is normal and healthy.

Restorative Care

In the patient's home, you can help create an environment that is comfortable for sexual activity. This may involve recommending ways to arrange the bedroom to accommodate an individual's limitations. For example, a patient in a wheelchair may prefer to move the chair close to the side of the bed at an angle that allows for more ease in touching and caressing. Suggestions regarding how to accommodate barriers such as Foley catheters or drainage tubes can contribute to enhanced sexual activity.

In the long-term care setting, facilities should make proper arrangements for privacy during patients' sexual experiences (Luekenotte, 2000). The ideal situation is to set up a pleasant

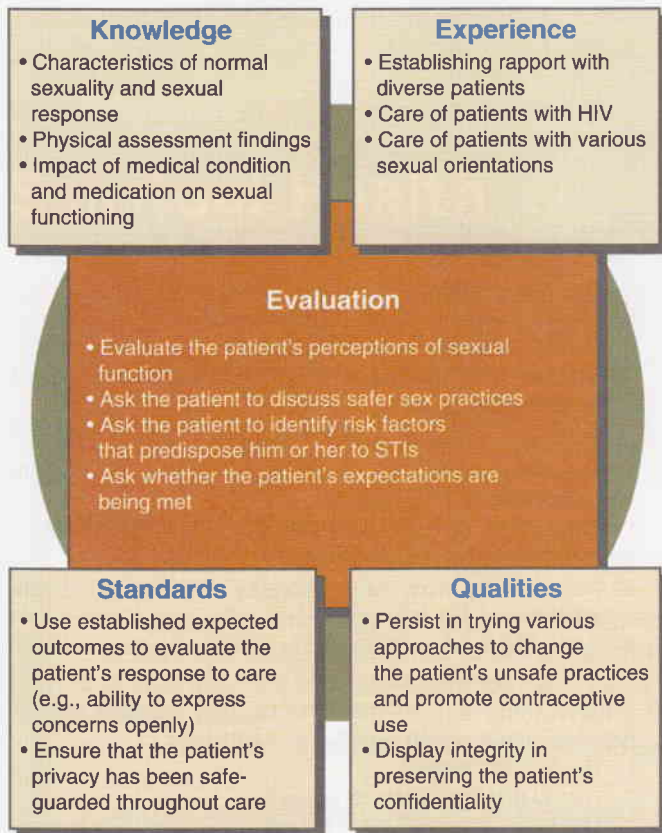


Figure 26-6 Critical thinking model for sexuality evaluation. *HIV*, Human immunodeficiency virus; *STI*, sexually transmitted infection.

room that can be used for a variety of activities but may also be reserved for private visits with a spouse or partner. If this is not feasible, you can make arrangements for the roommate of a patient to go to another place, in order to allow a patient and his or her partner time alone.

❖ Evaluation

Patient Care

To determine whether goals and outcome criteria have been met, you review patients' responses to interventions (Figure 26-6). Critical thinking ensures that you apply what you know about sexuality and the patient's unique situation.

In follow-up discussions with the patient or spouse, you determine whether goals and outcomes have been achieved. Patients can be asked to relate risk factors, verbalize concerns, share stories of their experiences, and clarify their level of satisfaction. You can also observe behavioural cues, such as eye contact, posture, and extraneous hand movements, that indicate comfort or are suggestive of continued anxiety or concern as topics are addressed. As outcomes are evaluated, you, the patient, and the spouse may need to modify expectations or establish time frames in which to achieve the target goals. All involved may need to be reminded of the individual nature of sexual expression and the multiple factors that affect perceptions and responses. Sexual wellness is not an absolute. An individual must define what is acceptable and satisfying. The partner's level of sexual satisfaction must also be considered. Sexual performance is seldom the exclusive focus of sexual

satisfaction. Open communication and positive self-esteem are essential factors in effectively resolving concerns.

Patient Expectations

In evaluating the outcomes of interventions related to sexuality, you must consult with the patient. Resolution of sexual concerns must meet the patient's perceptions of improvement. A patient must define what is acceptable and satisfying. In considering the status of sexual health, the patient's partner's perceptions of sexual satisfaction are also significant.

❖ KEY CONCEPTS

- Sexuality is related to all dimensions of health; therefore, as a part of nursing care, sexual concerns or problems should be addressed.
- Sexuality is a part of each individual's identity and includes sexual identity, gender identity, and sexual orientation.
- Attitudes toward sexuality vary widely and are influenced by religious beliefs, society's values, the family, and other factors.
- Nurses' attitudes toward sexuality also vary and may differ from those of patients; nurses should be sensitive to patients' sexual preferences and needs.
- Sexual development is a process beginning in infancy and involves some level of sexual behaviour or growth in all developmental stages.
- The physiological sexual response changes with aging, but aging does not lead to diminished sexuality.
- Sexual health involves physical and psychosocial aspects and contributes to an individual's sense of self-worth and positive interpersonal relationships.
- Sexual dysfunction can have an easily identified cause or varied and complex causes.
- Interventions for sexual dysfunctions depend on the condition and the patient; interventions may include giving information, teaching specific exercises, improving communication between partners, and referral to a knowledgeable professional.
- Choice and use of contraceptive methods are affected by desire for children, usual sexual practices, acceptable methods of contraception, frequency of sexual activity, comfort with genital touching, comfort with sharing contraceptive responsibility with the partner, and comfort with interruption of sexual acts.
- A brief review of sexuality should be included in every nursing assessment of a patient's level of wellness.
- Most nursing interventions to enhance a patient's sexual health involve providing information and education.

❖ CRITICAL THINKING EXERCISES

1. Your current clinical experience is in a community health care setting. You are conducting the initial interview with a 48-year-old man who started taking antihypertensive medications two weeks ago. You take his blood pressure and find it to be 136/74 mm Hg. You ask him how he has been doing since his last visit. He looks down at the floor and says, "Oh, okay, I guess. Seems like I'm just getting old now." What kind of follow-up would be indicated on the basis of this information?
2. You are assigned to care for a 15-year-old girl who was admitted after a motor vehicle accident. Yesterday she underwent internal fixation of a fractured ankle. In gathering her nursing history, you explore sexuality and learn that she has just recently become sexually active with her boyfriend of three

months. When you ask about safer sex and the use of birth control, she tells you that she knows she does not have to worry about STIs with him because he is just not one of those kinds of boys. In regard to birth control, she says that her boyfriend has reassured her that because he is pulling out before ejaculation, she does not risk becoming pregnant. How would you proceed?

3. You are working on a rehabilitation unit and caring for a 67-year-old man who had a stroke three weeks ago. He shares a room with another man who is recovering from a stroke. Your patient has been progressing in his self-care skills and is now able to get around with a cane, feed himself, and perform most of his bathing. His wife is in fairly good health, and the plan is for him to return home within the next one to two weeks. As you work with him one morning, he says to you, "You know, one of the things that is hardest about being here is not being able to sleep in the same bed as Greta. I miss her so much. Even though she visits every day, it is just not the same." How would you explore his comment, and what planning would you consider?

❖ REVIEW QUESTIONS

1. Gender identity is the individual's
 1. Sexual behaviour
 2. Sexual orientation
 3. Sense of being male, female, or some combination
 4. Sense of preferring one sex over the other
2. Sexual health refers to
 1. Having no STIs
 2. Awareness of and positive attitudes toward sexual functioning
 3. Using contraception consistently
 4. Sexual activity with multiple partners
3. Inability or difficulty in sexual functioning caused by numerous factors is called
 1. Sexual behaviour
 2. Sexual response
 3. Sexual orientation
 4. Sexual dysfunction
4. A major problem in dealing with STIs is that
 1. Symptoms are often absent or go unnoticed
 2. Most STIs cannot be treated with antibiotics
 3. Little is known about how they are transmitted
 4. Little can be done to help
5. The most common bacterial STI is
 1. Syphilis
 2. Genital chlamydia
 3. Gonorrhea
 4. HIV infection and AIDS
6. Of the following methods of contraception, which two require a health care provider's intervention?
 1. Diaphragm and intrauterine device (IUD)
 2. Condoms and hormones
 3. Cervical caps and condoms
 4. Sterilization and vaginal spermicides

7. Which of the following is the most effective contraception method for women?
 1. Female condom
 2. Birth control pill
 3. Contraceptive sponge
 4. Vaginal spermicide
8. The most valuable tool that you can use when providing sexual health care is
 1. Knowledge of right and wrong sexual behaviours
 2. Effective, nonjudgemental communication
 3. Nursing diagnoses
 4. Firm personal convictions about what constitutes normal sexual behaviour
9. When you are gathering a sexual history from an older adult, you must keep in mind that
 1. Older adults do not usually participate in sexual activity
 2. Older men always lose fertility
 3. Older adults may have difficulty discussing intimate matters
 4. Both older men and women are sexually dysfunctional
10. A useful framework for the nurse to guide planning and set priorities about sexual activity for a patient is
 1. The PLISSIT model
 2. The NANDA International guidelines
 3. The *Nursing Interventions Classification* (NIC) and *Nursing Outcomes Classification* (NOC) guidelines
 4. Your own theory of sexual behaviour

❖ RECOMMENDED WEB SITES

Public Health Agency of Canada: Sexual Health and Sexually Transmitted Infections: <http://www.phac-aspc.gc.ca/std-mts>

The Public Health Agency of Canada works with provinces, non-governmental organizations, and health care providers to improve and maintain the sexual health and well-being of Canadians. This Web site offers links to sexual health and STI information, publications, and resources.

Sunnybrook and Women's College Health Sciences Centre: <http://www.womenshealthmatters.ca/centres/sex/index.html>

Developed by Sunnybrook and Women's College Health Sciences Centre and the Centre for Research in Women's Health, this Web site provides information about women's sexual matters, including sexual expression, how female bodies work, pregnancy, birth control, abortion, and safer sex.

Review Question Answers

1. 3; 2. 2; 3. 4; 4. 1; 5. 2; 6. 1; 7. 2; 8. 2; 9. 3; 10. 1

Rationales for the Review Questions appear at the end of the book.

Spiritual Health

Written by Barbara Pesut, RN, PhD, Corinne Crockett, MHcS(N), RN, RScP, and Jeanette Vinek, RN, RScP, BScN, MHScN

objectives

Mastery of content in this chapter will enable you to:

- Define the key terms listed.
- Describe the historical influences of spirituality and religion on nursing.
- Discuss research findings that suggest a relationship between spiritual practices and patients' health status.
- Discuss the relationship between spirituality and nursing theory.
- Compare and contrast the concepts of religion and spirituality.
- Describe how spirituality may facilitate coping during times of illness or suffering over the life journey.
- Describe the relational attributes that facilitate spiritual nursing care.
- Discuss the process and qualities of spiritual nursing care.
- Discuss an ethical approach to spiritual nursing care.
- Discuss the role of the nurse in providing spiritual nursing care.
- Describe a process for understanding patients' spirituality.
- Discuss appropriate ways to facilitate patients' spiritual practices.
- Describe when it is necessary to involve a spiritual leader or pastoral care.
- Reflect on how to determine if your spiritual care has been therapeutic.

key terms

Agnostic, p. 436
 Atheist, p. 436
 Compassion, p. 439
 Faith, p. 436
 Holism, p. 435

Religion, p. 436
 Spiritual care, p. 443
 Spiritual health, p. 434
 Spirituality, p. 436
 Transcendence, p. 436

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The word *spirituality* is derived from the Latin word *spiritus*, which refers to breath or wind. The spirit gives life to, or animates, a person. Spirituality has been described as the centre of all aspects of a person's life, whatever gives that person ultimate meaning (Sessanna et al., 2007). Spirituality can be an important factor that helps individuals achieve the balance needed to maintain health and well-being and to cope with illness. Caring for a patient's spiritual needs means caring for the whole person, accepting his or her beliefs and experiences, and helping with issues concerning meaning and hope. Expert nurses help patients use their own spiritual resources as they identify what is meaningful in their lives and cope with the effects of illness and life stressors.

Historical Perspectives

Nursing has a rich spiritual heritage. Within this heritage, spirituality was most recognizable within religion. Religion provided a lens through which to acknowledge spiritual needs, express spiritual care, and pursue spiritual health. Organized nursing originated from religious orders, in which nuns were primarily responsible for providing nursing care. In Canada, the earliest nurses belonged to Roman Catholic orders devoted to care of the sick: most notably, the Sisters of Charity of Montreal (Grey Nuns), an order founded by Marie Marguerite d'Youville in 1737 (Paul, 2000). This noncloistered order was responsible for bringing a Judeo-Christian model of nursing care to the most remote areas of western and northern Canada. Florence Nightingale's ideas of modern nursing were first taught in London in 1860. Her model of Western nursing, rooted in Christianity, was spread around the world during the colonial era (Paul, 2000). Canadian missionary nurses were among those who brought Florence Nightingale's ideas of modern nursing methods to China, India, Japan, and Korea in the first half of the twentieth century (Grypma, 2008).

Religion was at the core of early nursing philosophies and practice until the nineteenth century (McSherry, 2001). But during the late nineteenth and early twentieth centuries, confidence in religion was replaced by confidence in medical science. Religious aspects of care became less visible. However, over the past several decades, many nurses became dissatisfied with a purely medical approach to care, partly because people realized that scientific research could not answer all the existential questions raised by patients (McSherry, 2001). Nurses felt a spiritual gap in the profession and began to find ways to articulate and incorporate spirituality into practice and research. Spirituality was conceptualized as broader than any particular religion or culture. Between 1980 and 2000, renewed interest in spirituality was reflected by an increase in nursing literature on spirituality, as well as a growing interest in parish nursing as a way for faith communities in Canada to reclaim their healing mission (Miller, 2004; Olson et al., 1998).

Canadian nursing scholarship has made important contributions by emphasizing the relationship between spirituality, religion, health, and culture (Kulig et al., 2004; Labun & Emblen, 2007; Pesut et al., 2008). For example, in their study of spirituality and health in Punjabi Sikh living in British Columbia, Labun and Emblen (2007) stated that an understanding of the interplay of spirituality, religion, and health informs culturally competent care. Just as Canadian nurses must understand cultural influences in health and illness, they must also recognize the need for sensitive, safe, and ethical nursing care in which patients' spiritual needs and resources are recognized and supported (Box 27-1). Because Canada is a pluralistic society in which diversity is valued, Canadian nurses must recognize how diverse views influence the way patients (and nurses) view spirituality (Pesut, 2006; 2009).

Spirituality and Health: Empirical Evidence

Spiritual health has been defined as "a connectedness with self, others, and the sacred that transcends and empowers the self" (Como, 2007, p. 226). Spiritual needs may increase as health declines (Bruce et al., 2011; Carson & Koenig, 2008; McSherry, 2006). There is increasing evidence that spirituality

* BOX 27-1 CULTURAL ASPECTS OF CARE

In caring for patients from different cultures, it is important that you take into account their cultural understandings of spirituality and religion. You must determine what is important in their lives and what provides them with inner strength and meaning. Patients are often attempting to find meaning in the changing circumstances of their health and illness but that meaning will differ depending on their values and beliefs. For example, Shih et al. (2009) explored the spiritual needs of older Taiwanese patients with terminal cancer using participant observation and in-depth interviews. They suggested that caring for the body and transcending worldly being were common patterns and emphasized, among other things, the important role of the funeral ceremony in purifying the soul and contributing positively to the afterlife. Similarly, Mok, Wong, and Wong (2010) explored through interviews the meaning of spirituality and spiritual care among Hong Kong Chinese terminally ill. An important finding from this study was that all participants had difficulty understanding and expressing spirituality. Further, they did not expect spiritual care from nurses but desired quality interpersonal care. Reimer-Kirkham (2009) explored the negotiation of religious and spiritual plurality in health care encounters and used the example of Sikh patients to highlight how lived religion is a moral code that informs all of life and has important implications for ethical nursing care.



Implications for Practice

- Explore the spirituality of patients within the contexts and meanings of their own cultures. Spirituality may not be the language that is most familiar to them. It is always appropriate to explore the meaning of health and how patients achieve balance, stability, peace, or comfort in their lives.
- Offer a universal and holistic approach to patients by demonstrating caring and by using therapeutic communication techniques.
- Promote an environment during assessment in which human rights, values, customs, and spiritual beliefs are respected.
- Include appropriate spiritual or religious care providers.
- Avoid the use of language that alienates patients or discriminates between different religions (e.g., asking whether the patient wants someone from his or her "faith community" to visit, rather than "temple," "church," or "synagogue").
- Understand that different cultures and religions have ethical codes that are an important part of ethical nursing care.

References: Mok, E., Wong, F., & Wong, D. (2010). The meaning of spirituality and spiritual care among the Hong Kong Chinese terminally ill. *Journal of Advanced Nursing*, 66(2), 360–370. Reimer-Kirkham, S. (2009). Sikhism as lived religion: Implications for healthcare ethics. *Nursing Ethics*, 16(4), 410–421. Shih, F., Lin, H., Gau, M., Chen, C., Hsiao, S., Shih, S., & Sheu, S. (2009). Spiritual needs of Taiwan's older patients with terminal cancer. *Oncology Nursing Forum*, 36(1), E31–38.

has the potential to mobilize personal capacities, illness-coping strategies, and positive health behaviours (Como, 2007; Krok, 2008; Lawler-Row & Elliott, 2009; Levin, 2010; Vespa et al., 2011; Whelan-Gales et al., 2009). For example, research involving 263 patients with cancer found that those who reported healthy inner spirituality, spiritual coping, and spiritual well-being were less likely to experience depression and intrapersonal/interpersonal conflicts (Vespa et al., 2011). Positive spiritual and religious coping has also been linked to a

sense of calmness, peace, decreased anxiety, and improved mood, which in turn correlated with an improved tolerance to pain (Wachholtz et al., 2007). An exploration of the beliefs of 228 hospitalized patients in Australia found that 80% of respondents felt that religious and spiritual beliefs aided in the healing process by providing psychological support, an improved sense of well-being, and support in maintaining a healthy lifestyle (Hilbers et al., 2010, p. 5). Recent research into the relationship between spirituality/religion and mental health suggested that religion could have a protective effect, although caution must be exercised with patients whose psychiatric concerns include religious ideations (Levin, 2010). Among older adults, spiritual well-being and use of prayer were positively related to physical and psychological well-being (Lawler-Row & Elliott, 2009).

Mind-Body Connection and Psycho-Neuro-Immunology

Increasingly, researchers are trying to determine why spirituality may be related to health, particularly from a physiological perspective. The number of studies exploring the mind-body connection, and psycho-neuro-immunology in particular, has increased exponentially. The question of whether the relationship between spirituality and health is simply a placebo effect has arisen in the literature (Breslin & Lewis, 2008). Current research into the placebo effect, once considered proof of hypochondria or hysteria, has focused on the power of the mind to affect the health of the body (Kradin, 2010; Lidstone & Stoessl, 2007). Thoughts and beliefs mediate chemical responses in the body that support or inhibit health and healing (Lidstone & Stoessl, 2007). Try the exercise in Box 27-2 to get a sense of the mind-body connection.

Physical health is affected by beliefs, expectations, and thoughts. Although the mechanisms are not yet fully understood, body, mind, and spirit are interconnected; when one facet of a person faces a challenge or receives support, the others are affected. This idea is commonly referred to as **holism**. For example, cardiovascular health and immune function are affected by stress (Carson & Koenig, 2008). Recent research on wound healing and stress found that both psychological and physiological stress delay wound healing and increase the potential for wound infection (Gouin & Keicolt-Glaser, 2011). Research such as this suggests that spiritual and religious rituals may do more than just provide a comforting effect. Prayer, meditation, contemplation, sacraments, rituals,

and other practices that support spiritual and religious expression may indeed reduce stress and support health and healing (Tuck et al., 2006). Understanding the role spirituality plays in a patient's life and which spiritual practices are important to them allows the nurse to support the health and healing of those receiving care. This is the reason why it is important to consider spirituality in the context of nursing theory, a topic that we turn to next.

Spirituality and Nursing Theory

Nursing theory is a logical structuring of ideas that inform what we believe nursing to be and how nurses go about their work. One of the first formal theoretical thinkers in nursing was Florence Nightingale (Meleis, 1997; Thorne, 2003). Her theoretical thinking was largely informed by her beliefs about God and natural law (Calabria & Macrae, 1994). During the late 1950s and early 1960s, nurses began to construct theoretical models of nursing, and over the next two decades nurses produced over 20 new models (Thorne, 2003). Some of these models included spirituality as an aspect of nursing practice (Martsolf & Mickley, 1998).

One of the ways that nurses have developed theory in relation to spirituality has been through nursing diagnoses. Although three nursing diagnoses related to spirituality are currently accepted by the North American Nursing Diagnosis Association International (2009)—*readiness for spiritual well-being*, *spiritual distress*, and *risk for spiritual distress*—their use in nursing practice is debated. Some scholars are challenging the idea that spirituality should be thought about in the context of a problem-solving process—that is the idea that spirituality should be thought of from the perspective of problems that can be diagnosed and solved. For example, Pesut (2008b) urged nurses to “resist the notion that there is some idealized spiritual state ... the absence of which necessarily dictates some pathological process” (p. 172). Nurses need to be cautious about creating criteria that indicate normal spiritual health, particularly those based on positive emotions such as peace and happiness (Pesut & Sawatzky, 2006). This is particularly important in light of research findings that suggest that individuals, even at end of life, may not feel comfort or peace but still experience spiritual growth (Kruse et al., 2007). The mysterious nature and experience of spirituality must not be reduced to problems or nursing diagnoses. That is why this is one of the few chapters in this textbook that does not use the nursing process.

Spirituality and religion have informed nursing theory in important ways. Nurses care for individuals during times of sickness and death. Therefore, nursing theory tries to answer fundamental questions about the nature of persons, about health, and about the environment (Meleis, 1997). Historically, these questions have been answered through religious or philosophical thinking, so it is not surprising that many nurses draw on these beliefs to inform nursing theory. Nursing models have been derived from Western Christian religious perspectives (e.g., Bradshaw, 1994; O'Brien, 2008) and from Eastern Chinese and Indian perspectives (e.g., Martha Rogers, Margaret Newman, and Rosemary Parse [as cited in Sarter, 1988]).

A debate has emerged in nursing about whether spirituality should inform nursing theory. There are those who believe that spirituality is an essential part of holistic care and so should be a fundamental consideration in nursing care. Others have

► BOX 27-2

Mind-Body Connection: Try It for Yourself

Settle back and gently close your eyes. Imagine a plump, juicy, yellow lemon. Holding the image of the luscious lemon in your mind, imagine picking up the lemon and smelling it. Imagine cutting the lemon in half, with the juices squirting out. In your mind's eye, bring half of the cut lemon to your lips and squeeze the juice into your mouth.

What happened? Did you salivate? Some people even experience a puckering of their mouths.

This is an example of the mind-body connection that demonstrates the effect of a thought on the body. Spiritual practices, which support feelings of transcendence, connection, well-being, and calm, support healing.

argued that in a diverse society, not everyone believes in spirituality, so nursing theory should be based on a naturalistic model (meaning it should deal only with what can be verified empirically) (Hussey, 2009; Paley, 2008). This is an important question for nurses to think about. However, it would be difficult to exclude spirituality from nursing theory when it is important to many patients (Pesut, 2008a). The more important question becomes how nurses can include it in a way that it is sensitive to the many beliefs about spirituality that exist in a diverse society (Pesut, 2010). This will be discussed further under the ethical aspects of spiritual care.

Conceptualizing Spirituality and Religion

Conceptualizing is an important part of nursing thinking. Conceptual work consists of creating definitions that become tools for nurses that bridge between the broader world of ideas and the unique nurse–patient interaction (Thorne, 2005). Over the past two decades, nurses have struggled to create a definition of **spirituality** for nursing practice. Several integrative reviews of spirituality in health care literature have identified the following common themes: meaning, purpose, hope, connectedness, relationship, transcendence, existential experiences, and power/force/energy (Chiu et al., 2004; McCarroll et al., 2005). However, trying to define spirituality has been challenging. If we try to include all of the diverse ideas about what spirituality is, the concept becomes too vague to be useful for nursing practice or knowledge development. You only have to think about the themes identified above to realize that they cover the entire human experience. This has been a real problem for the development of practice-based knowledge about spirituality.

Many use the terms *religion* and *spirituality* interchangeably. Although closely associated, these terms are not synonymous. **Religion** is an organized system of beliefs concerning the cause, nature, and purpose of the universe, especially belief in or the worship of God or gods (Andrews & Boyle, 2007). It is a structured search for the spiritual and an outward expression of spirituality (Emblen, 1992). Religious practice encompasses spirituality, but spirituality need not include religious practice. A person's spirituality may be expressed in religious and philosophical beliefs and practices, and these may differ widely, depending on the person's race, gender, social status, religion, ethnicity, and experience (Johnston Taylor, 2002). Although nursing literature draws a clear distinction between spirituality and religion, the boundaries are much less clear in actual experience (Macrae, 2001). For many patients, the term *spirituality* may still be closely related to religion, and many individuals' spiritual practices are drawn from a variety of religious traditions (Pesut et al., 2008b). Indeed, 53% of Canadians still describe spirituality in traditional terms such as *prayer*, *religion*, and *a power beyond* (Bibby, 2006).

Another common term individuals use to express their spirituality is that of **faith**. Faith is often used in two ways: as a cultural or institutional religion, such as Judaism, Buddhism, Islam, or Christianity; and as a relationship with a divinity, a higher power, an authority, or a spirit. Faith may also be the manner in which a person chooses to live life, apart from religion or spirituality. Faith in this sense enables action. For example, a person might believe that having a positive outlook on life is the best way to achieve life's goals. Faith may also involve a sense of **transcendence**: an awareness of something that a person cannot see or know in ordinary physical ways (Perry, 2004) or an experience of fullness that goes beyond

daily life (Taylor, 2007). This experience does not necessarily need to be understood in relation to God—it may be in relation to the universe, nature, or humanity. It gives purpose and meaning to an individual's life, allowing for action. For example, in patients with advanced cancer, faith may provide significant strength and resources to cope with their illness (Lin & Bauer-Wu, 2003).

An important principle to consider when conceptualizing spirituality is respect for diversity. Part of respecting diversity is recognizing that some individuals might be offended by the claim often made in nursing literature that all individuals are spiritual (Pesut et al., 2009). Some individuals either do not believe in the existence of God (**atheist**) or believe that any ultimate reality is unknown (**agnostic**) and so may resist the idea that all persons have a spiritual nature. Thorne (2005) has encouraged nurses to remember that the purpose of conceptualizing is to support nursing's service to society. Conceptualizing about spirituality in nursing must serve a diverse society.

Spirituality and the Life Journey

Children's ideas of a higher power or supreme being are often based on what is presented to them in their homes or religious community. Their spirituality develops as they learn about themselves in relationship with others. Adolescents may reconsider their childhood concept of a spiritual power and, in the search for an identity, may question values and practices. Many Canadian teenagers and young adults who have been reared in a religious tradition "drop out" of their religious system as they search for a personalized belief system and clearer meaning of life (Bibby, 2002). Many adults experience spiritual growth by entering into lifelong relationships. An ability to care meaningfully for others and the self is evidence of a healthy spirituality. Older adults often turn to important relationships and the giving of themselves to others as spiritual tasks. As people mature, they often turn inward to enduring values and to a concept of a supreme being or a higher meaning that has been sustaining and meaningful. A healthy spirituality in older adults is one that gives peace and acceptance of the self. A positive relationship to a higher power may help to protect older adults from the negative effects of loss and changing identity that occur with aging (Griffith et al., 2007). (See Box 27-3 for a Focus on Older Adults).

Along this life journey, spirituality and religion can play an important role in the lives of individuals. For example, they can provide answers to the some of the big questions in life such as "What is life all about? How should I live a good life? What happens to me after I die?" Communities of faith can provide important connections and social support. Spiritual practices help individuals to grow and transform as persons. Spiritual experiences provide a sense of fullness that creates a sense of transcendence and connection to something greater (Taylor, 2007).

However, few individuals experience life's journey without facing an unexpected or chronic illness or injury resulting in suffering and loss. Such events can lead to both spiritual challenges and transformation. Spiritual dimensions of the illness experience may include reconsidering beliefs about life; maintaining spiritual or religious practices; connecting with God and significant others; and finding balance, courage, and growth (Van Leeuwen et al., 2007).

In the face of suffering, individuals may feel alone or even abandoned by God. They may question their spiritual values

* BOX 27-3 FOCUS ON OLDER ADULTS

Factors That Put Older Adults at Risk

- Loneliness and social isolation
- Hopelessness in the face of losses or terminal illness
- Anxiety
- Depression



Interventions to Facilitate Connectedness

- Include family in activities and plans
- Place memorabilia in view of the patient
- Talk about things that are meaningful and reminisce
- Bring pets in to visit
- Provide access to nature
- Refer to mental health providers for cognitive behavioural therapy
- Physical touch, massage
- Aromatherapy and music

Interventions to Facilitate Hope

- Develop caring relationships and provide continuity of care providers
- Life-review therapy—help to identify significant losses
- Use past experiences to reinforce coping skills
- Promote a restful and relaxing environment
- Implement relevant rituals and traditions

Source: Meraviglia, M., Sutter, R., Gaskamp, C. D., Adams, S., & Titler, M. G. (2008). Evidence-based guideline: Providing spiritual care to terminally ill older adults. *Journal of Gerontological Nursing*, 34(7), 8–14.

and beliefs, raising questions about their way of life and purpose for living. Anger is not uncommon, and patients may express anger toward God, their families, themselves, or health care providers. People also look for ways to remain faithful to their beliefs during their suffering. They may pray, attend religious services, or reflect on the positive aspects of their lives. Individuals who have a sense of spiritual health, who feel connected with a higher power and other people, and who are able to find meaning and purpose in life are better able to cope with chronic illness; better coping helps them achieve their potential and enhances quality of life (Adegbola, 2006; Narayanasamy, 2004).

Terminal illness is the end of the life journey and brings unique struggles. As the physical body dies, individuals are confronted with questions about the meaning of their life and what comes after. Fears of physical pain, isolation, and losing control are common, both for oneself and for one's family. Spiritual beliefs and practices often provide a source of comfort and strength, and individuals may experience end of life as a time of positive spiritual transformation (Alcorn et al., 2010). Tanyi and Werner (2008) interviewed 16 women with end-stage renal disease and found that spirituality helped them accept illness and mortality, find strength and understanding during the experience, and counter negative emotions such as anger, fear, and depression.

The spiritual framework of coping illustrated in Figure 27-1 provides an overview of how spirituality relates to coping and health. An illness or injury would constitute a stressor. The experience of that illness or injury is shaped both by personal

* BOX 27-4 RESEARCH HIGHLIGHT

Mapping the Process and Qualities of Spiritual Nursing Care

Research Abstract

Carr (2008) explored the meaning of spiritual nursing care using in-depth, open-ended interviews in an oncology setting. Her 29 participants were nurses, patients, family members, and administrators. Using phenomenological analysis, she constructed an account of spiritual nursing care that, at the core, was developing caring relationships and fostering connections. Receptivity, humanity, competency, and positivity were essential characteristics for spiritual care to be realized. Receptivity entailed being open and present and recognizing subtle cues. "Big things can come out of small talk" (p. 693). Humanity entailed allowing both the nurse and the patient to bring their identities to the encounter. Competency entailed giving good physical care. Positivity entailed exchanging a form of energy that was hopeful, positive, humorous, and characterized by faith.



Evidence-Informed Practice

- Be open and receptive to those under your care.
- Listen well, and listen for what is not said.
- Engage in small talk as a safe entry into more significant discussions.
- Do the little things that make a difference.
- Provide excellent physical care.
- Nurture your own faith so that others can share the "positivity" it produces.

Source: Carr, T. (2008). Mapping the processes and qualities of spiritual nursing care. *Qualitative Health Research*, 18(5), 686–700.

factors and how one appraises the event. For example, an individual might attribute the cause of an illness to a punishment by God for a sin they committed and this would magnify the stressor. The effect of the stressor is also determined by personality factors such as problem-solving styles or hope and religious influences such as doctrinal beliefs and religious orientation. Perceptions of God, and in particular whether God is more likely to be punishing or loving in the face of suffering, greatly influences appraisals of illness. How one appraises the stressor contributes to the effect of that stressor. Individuals can then enact spiritual coping behaviours, both corporate and private, and work to establish spiritual connections. These coping strategies may in turn contribute to enhanced meaning making and well-being.

What do patients expect from nurses in the area of spiritual care? (See Research Highlight in Box 27-4.) Although nurses are not typically seen as primary spiritual care providers, patients do appreciate having nurses know about their spirituality and showing spiritual concern. This is most often the case if spirituality is important to the patient, in the context of life-threatening illness, and if there is some relationship present (Johnston Taylor, 2007b). In a recent study of Chinese individuals with terminal illness, participants suggested that although they did not expect nurses to provide spiritual care, a compassionate environment that promoted hope and acceptance supported their spirituality (Mok et al., 2010). Similarly, another study that explored spiritual care in female patients on dialysis suggested that patients appreciated nurses who cared, who tried to understand their spirituality, and who helped support

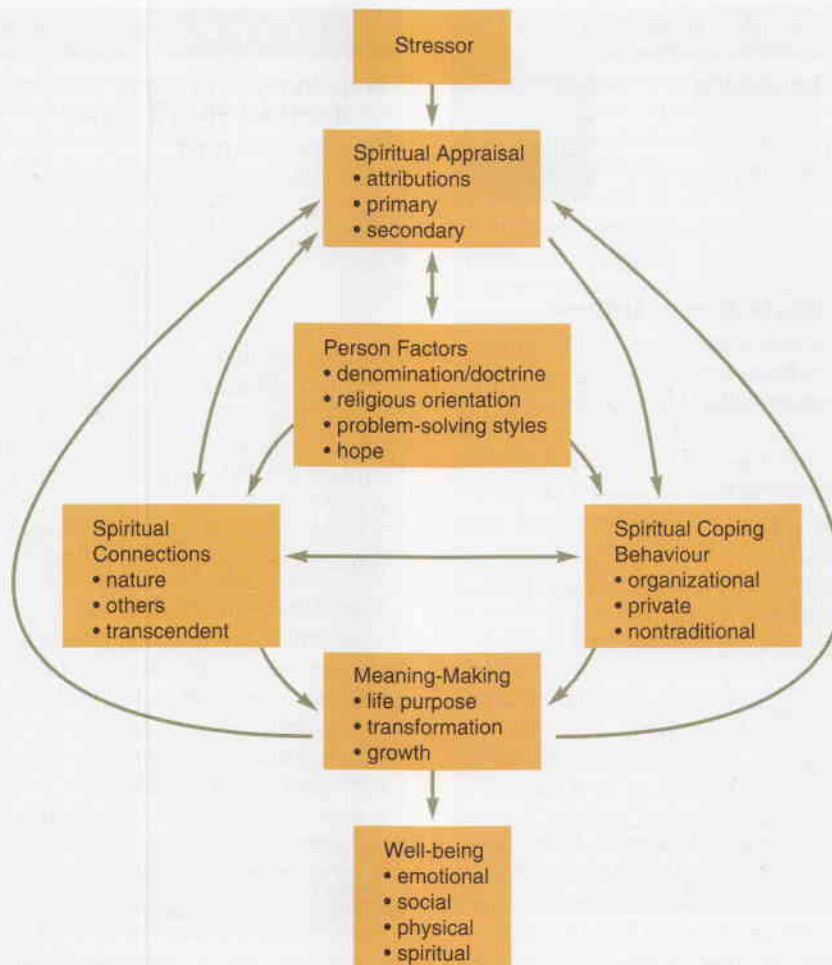


Figure 27-1 The spiritual framework of coping (an adaptation and application of the transactional model). **Source:** From Gall, T. L., Charbonneau, C., Clarke, N. H., Grant, K., Joseph, A., & Shouldice, L. (2005). Understanding the nature and role of spirituality in relation to coping and health: A conceptual framework. *Canadian Psychology*, 46(2), 88–104. Copyright © 2005, Canadian Psychological Association. Permission granted for use of material.

appropriate spiritual activities (Tanyi et al., 2006). A recent content review of spiritual care by nine nursing experts affirmed that practices such as listening, supporting spiritual practices, and making referrals are important when supporting patients' spirituality (Johnston Taylor, 2008).

Critical Thinking

At the core of nursing, and indeed at the core of all human service professions, is a commitment to caring for each person as a unique and inherently valuable individual. In the case of spirituality, this commitment begins with a respect for each person's beliefs. Fundamental differences exist in the ways people experience the world and find meaning in that experience. Critical thinking in the context of spiritual care entails two important processes. First, it means gaining an understanding of the patient. This includes their spiritual and religious values, beliefs, and experiences and how those are influenced by their current circumstances. Naturally, the depth of this assessment must be sensitive to the circumstances (e.g., patients coming in for day surgery as opposed to palliative care) and the depth of the nurse–patient relationship. Second, a critical thinking approach to spiritual care entails ensuring

that the care provided is both ethical and based on the best available evidence. This also entails knowing the appropriate criteria on which to base an evaluation of nursing care.

Understanding Patients' Spirituality

You will note that we have chosen not to use the language of assessing spirituality. Spiritual care is different from the physical aspects of care. Spirituality contains an element of mystery that cannot be assessed and treated in the same way that you might treat a physical problem, such as a pressure ulcer. Diagnosing and intervening in a patient's spirituality could be considered disrespectful and intrusive. Instead, nurses should think about *understanding* rather than assessing patients' spirituality. It could be thought of as a series of conversations whereby nurses seek to understand what is important and meaningful to individuals. The depth of that conversation will rest largely on the circumstances the patient is facing and the extent of relational development. But even more important, the nurse should discover those values and beliefs that are important to take into account in health care. Does the patient have beliefs that will influence important health care decisions? Are there religious rituals or restrictions that should inform care? Without knowing these details, the nurse risks harming the

patient. For example, a nurse who removes sacramental garb or provides food that is prohibited may actually be contributing to the breaking of religious law and thus be seen to be harming that individual's spirit.

In these conversations, the nurse is not the expert but rather a co-learner in the mysteries of life. This kind of work generally consists of quiet conversations, effective listening, and communication through presence and touch (Draper & McSherry, 2002). In many cases, nurses would say that they are the learners. Patients teach them about life as they share their stories of transition and suffering. Above all, the process of learning about a patient's spirituality should be grounded in an understanding of compassion and community (Heliker, 1992). The term **compassion** comes from the Latin words *pati* and *cum*, meaning "to suffer with." *Community* is derived from the Latin word *communio*, meaning "fellowship." To be compassionate is to "enter into places of pain, to share in brokenness with other human beings" (Heliker, 1992). To practise compassion as a nurse requires awareness of the human tie between patients and a healing community.

However, even though understanding is a relational and evolutionary process, it is still important that the nurse have some form of systematic approach to ensure that critical information is obtained. When patients enter a health care facility, it is essential to obtain information about their religious and spiritual beliefs and practices. This has been referred to as a spiritual screening and seeks to discern whether spirituality and religion are important to the individual and, if so, what beliefs or practices are most important to take into account in the context of care.

Numerous tools are available to enable nurses to gain a deeper understanding of patients' spirituality (e.g., see Johnston Taylor, 2002). Johnston Taylor (2002) has formulated one such tool, which builds upon the work of previous nursing scholars and can be used to start to question the spiritual health of a patient (Box 27-5).

Remember that how this tool is used will depend on the circumstances. It may not be relevant to have answers to all of the areas listed. You may need to modify certain questions in light of the patient's beliefs. For example, if the patient claims

► BOX 27-5 Procedural Guideline

Understanding a Patient's Spirituality

Spirit-Enhancing Practices or Rituals

- How do you express your spirituality (or philosophy of life)?
- What spiritual or religious practices or activity are important to you?
- How has being sick affected your spiritual practices?
- How does being sick have an impact on your praying (or other rituals)?
- How and for what do you pray?
- What spiritual or religious books are helpful to you?
- What effects do you expect your illness to have on your spiritual practices or beliefs?
- What kinds of readings, artwork, or music are inspirational for you?
- How do Holy Scriptures help you in daily life?
- How can I as a nurse help you with your spiritual practices?
- How do your religious practices help you to grow spiritually?

Involvement in a Spiritual Community

- How involved in a spiritual or religious community are you?
- What kind of relationship do you have with the leader of your spiritual community?
- In what ways does your spiritual community help you when times are bad?
- Are you having difficulty carrying out your religious duties?

Sense of Meaning

- What gives most meaning to your life?
- What is the most important thing in your life?
- What are your thoughts about, or explanations for, suffering? Are these beliefs helpful?
- What do you see as the plan or purpose for your life?
- Have you been able to answer any of the "why" questions that often accompany illness?
- What, if any, have been the good outcomes of having this difficult time in your life?
- What, if anything, motivates you to get well?

Giving and Receiving Love, or Connectedness to Self (Degree of Self-Awareness) and Other

- What do you do to show love for yourself?
- What are some of the most loving things that people have done for you?
- What are the loving things that you do for others?
- How do others help you now? How easy is it to accept their help?
- For what do you hope? How do you experience hope?
- How have you experienced forgiveness during your life/illness?

Sources of Hope and Strength

- What helps you to cope now?
- What (or who) is your source of hope? of strength? How do they help?
- To whom do you turn when you need help? Are they available?
- What helps you most when you feel afraid or need special help?
- How can I help you maintain your spiritual strength during this illness?
- To what degree do you trust your future to God?
- What brings you joy and peace in your life? What do you believe in?
- What do you do to make yourself feel alive and full of spirit?

Linkage Between Spirituality and Health

- How does your spirituality affect your experience of being sick?
- How has your current situation/illness influenced your faith?
- How has being sick affected your sense of who you are (or how has being sick affected you spiritually)?
- What has bothered you most about being sick (or in what is happening to you now)?
- What do you do to heal your spirit?
- Has being sick (or your current situation) made any difference in your feelings about God or your faith experience (or in what you believe)?
- Is there anything especially frightening or meaningful for you now?
- Do you ever wish for more faith to help you with your illness?
- Has being ill ever made you feel angry, guilty, bitter, or resentful?

to be spiritual but not religious, and if God is not part of that spirituality, you may need to delete certain questions. The key is to be sensitive to what patients want to tell you and to be a good listener. If religion and spirituality are important to their lives, and if they find you a compassionate and open listener, you will be more likely to gain meaningful information.

Further, it is important to think about how and when the information will be gathered and recorded. Numerous nurses are involved in one patient's care. Having all of these nurses inquire using this tool is not appropriate. For each nursing context, it is important to ask the following questions and to create policies and procedures that address these questions.

- Who should be collecting this data?
- How extensive should the assessment be in light of the clinical context?
- At what point in the care trajectory should this information be obtained?

There is a fine balance between establishing a relationship prior to asking questions in this area and making sure that you know enough to provide safe and ethical care. Which responses should be documented so that the information is available to all health care providers and which responses should be held in confidence? You can imagine yourself responding to questions such as "What feelings do you have after you pray?" and how you would feel if your responses were made available to everyone who had access to your health care record. Pondering and answering these questions in your health care context is part of expert nursing thinking and critical judgement.

This more in-depth understanding of a patient's spirituality has certain goals that should guide these conversations:

- Invite patients to share their spiritual beliefs and values.
- Learn about those beliefs and values.
- Open an opportunity for compassionate care.
- Empower patients to draw on their resources for healing and acceptance.
- Identify practices and beliefs that are important for the plan of care.
- Identify those patients who would benefit from a referral to a spiritual care provider. (Puchalski et al., 2009)

Ethical Spiritual Care

The *Code of Ethics for Registered Nurses* (Canadian Nurses Association, 2008) requires nurses to treat all patients with dignity and respect. In providing nursing care, you must not discriminate on the basis of spiritual beliefs, age, ethnicity, marital status, gender, race, sexual orientation, health status, or disability. However, for many, discrimination is not a conscious process but rather an unchallenged set of biases that cause us to react to others in less than caring ways. Therefore, an important part of ethical spiritual care is constantly working with your own potential biases as a nurse. This is more commonly known as reflective practice. In the process of delivering care, the nurse remains open to internal dialogues and feelings that have the potential to violate patients' dignity or respect. Once the nurse identifies those internal feelings, he or she can do the hard work of trying to understand the origins of those feelings so that engagement with patients can grow ethically. This is particularly important in the context of religion and spirituality, as society tends to polarize over religious beliefs. If you are a "believer," do you judge harshly the "unbeliever"? If you are agnostic or atheist, do you dismiss the believer? Box 27-6 provides some questions that are useful for you to reflect on.

► BOX 27-6 Nursing Care Reflective Exercises

Take a few moments to reflect on the following questions:

- Do you believe that there is a God or ultimate authority in the universe? If so, how does that belief influence your behaviour, and ultimately your nursing care?
- How do you feel about religion? Should religious beliefs be accounted for in the context of nursing care?
- Why does suffering happen in the world? How should individuals respond to suffering?
- What behaviours in life do you consider immoral or wrong? What patients might you look after who would exhibit those behaviours and how might your beliefs influence your ability to give care?
- Do you come from a religious background and does that background encourage you to share your beliefs and possibly to convert others to those beliefs? How might that influence your practice? Should patients be allowed to try to convert you to their beliefs?
- What happens to you after you die?

Although these may seem like questions unrelated to nursing practice, understanding more about what you believe will help you to deal more authentically with the beliefs of others. It will also help you to think through issues that will ultimately arise in the context of your practice. It is also important to know that nursing practice itself might challenge you to rethink and reframe your beliefs. That is an important part of growing as a person.

In a recent study led by Canadian scholar Reimer-Kirkham, one of the key strategies of successful spiritual care was identifying points of commonality across diversity. Health care providers spoke of finding a human connection that transcended differing belief systems (Pesut & Reimer-Kirkham, 2010). This approach means identifying the common values that make people human and respecting the commitments and values that make humans unique. Love, trust, hope, forgiveness, meaning, and community are needs of all people.

Beyond a foundational approach of respect, there are two important ethical issues when nurses engage in spiritual care. The first is understanding and respecting appropriate nurse-patient boundaries. The second is ensuring that you are competent to engage in spiritual care and knowing when you are beyond your competency, so that you can refer to a spiritual care provider or social worker. Nursing is a relational process and so it is not always easy to discern where the professional boundaries lie. This is particularly relevant in spiritual care. When we establish a relationship with patients and we discern that they want to share the more intimate aspects of their spiritual lives with us, it is not always easy to know what is appropriate to do. Here is where questions arise, like the following:

- Is it appropriate to share my own beliefs with patients, particularly if they are different than theirs?
- Is there a role for proselytizing in nursing, or what do I do if patients try to proselytize me?
- Should I participate in religious practices like prayer if patients request it of me?
- How do I respond to what I perceive to be unhelpful spiritual beliefs (e.g., when individuals feel that they are being punished by God or resist health care treatment because they believe they will be divinely healed)?

The answers to these questions are complex and the responses will vary according to the context. This is why expert nursing judgement is so important. The *Code of Ethics for Registered Nurses* provides some important guidelines:

- Nurses provide care directed first and foremost toward the health and well-being of the person, family, or community in their care.
- Nurses respect the informed decision making of capable persons, including choice of lifestyles or treatment not conducive to good health.
- In health care decision making, in treatment, and in care, nurses work with persons receiving care, including families, groups, populations, and communities, to take into account their unique values, customs, and spiritual beliefs, as well as their social and economic circumstances.
- Nurses maintain appropriate professional boundaries and ensure their relationships are always for the benefit of the persons they serve.
- If nursing care is requested that is in conflict with the nurse's moral beliefs and values but in keeping with professional practice, the nurse provides safe, compassionate, competent, and ethical care until alternative care arrangements are in place to meet the person's needs or desires. (Canadian Nurses Association, 2008)

As you study these guidelines, you can see that there are some important principles to adopt in relation to boundaries and spiritual care. First, it is always the patient's best interest that should be foremost. In the case of sharing your own values and beliefs, the first question should be whose interests does this serve, yours or the patient's. Second, patients have a right to make decisions about their health care on the basis of spiritual and religious beliefs that we may not agree with. Our role is to inform them of the best evidence in relation to their decision. They have the right to choose. Third, as a nurse you, too, have the right to abstain from health care situations that violate your religious or spiritual beliefs, providing you ensure that alternative arrangements can be made. The following quotation, taken from a consensus report on spiritual care in palliative care, is an excellent statement on boundaries in the context of professional patient relationships:

The health care professional–patient relationship is often a one-way relationship that lacks equality and reciprocity. Boundaries allow for compassionate presence in the healing encounter. Health care professionals are more vulnerable to crossing these boundaries when they are overworked, stressed, or have experienced chronic losses or grief. Thus, it is critical that institutions and individual professionals make opportunities for appropriate self-care and reflection to avoid these risks. (Puchalski et al., 2009, p. 901)

The situations described above are just a few illustrations of how important it is to ensure that, as a nurse, you are competent to engage in spiritual care. Competencies for spiritual care include establishing therapeutic relationships, understanding the meanings of diverse spiritualities and their implications for care, and knowing when to refer to spiritual care providers (see Safety Alert). Although many nursing studies have suggested nurses feel ill-prepared to provide spiritual care, these studies often suggest that spiritual care is a discrete domain of care rather than an aspect of care that is embedded within the caring relationship in nursing. Thus, nurses are already well prepared to engage in the types of authentic and trusting relationships that provide a good context for spiritual care.

safety alert

One of the most important competencies for nurses is knowing when to refer to a spiritual care provider (we are using the term *spiritual care provider* to refer to both health care chaplains and spiritual leaders from the community who provide spiritual oversight to a group). Although nurses can provide a caring context for patients' spirituality, this should not in any way be misconstrued to suggest that nurses have expertise in spiritual care (unless they have additional education in this field). Part of excellent care is understanding when patients require expert assistance, either from a spiritual leader from their tradition or from a social worker if they do not adhere to a religious tradition (Pesut et al., 2009).

Fowler (2002), a nurse, theologian, and health care chaplain, has suggested that spiritual care has layers, somewhat like an onion. At the outermost layers are public and semipublic information that most individuals willingly share. However, as you peel the layers away, you encounter more intimate layers when individuals often struggle with troubling feelings, guilt, and concerns and encounter challenges that should be dealt with only by a trusted religious leader. Nurses are competent to deal with the more public layers and should be concerned about things such as the influence of their own tradition on health, healing, decision making, and beliefs about illness, suffering, and end of life. However, for a nurse to go beyond those layers to the deeper spiritual struggles is risky both for the nurse and the patient. Fowler likens it to a nonswimmer jumping in to save a drowning person. Nurses are not educated to address health related spiritual beliefs. If those beliefs are unhealthy (e.g., when individuals feel that God is punishing them), the nurse may not have the expertise to provide a reframing of those beliefs toward a more healthy outcome. Therefore, it is critical that nurses know who their referral persons are and be quick to refer if they sense that the spiritual struggles are beyond their expertise.

Sources: Fowler, M. (2002). *Spiritual care in nursing*. Course lectures in graduate course, Azusa Pacific University, Azusa, CA; and Pesut, B., Fowler, M., Reimer-Kirkham, S., Johnston Taylor, E., & Sawatzky, R. (2009). Particularizing spirituality in points of tension: Enriching the discourse. *Nursing Inquiry*, 16(4), 1–10.

However, what nurses are often less confident about is providing care across diverse religious and spiritual traditions. This is a valid concern in light of the risk for harm if we fail to take into account these beliefs. For example, taking off the sacred garb of a baptized Sikh has important religious implications. Although doing so is often unavoidable in health care, it requires sensitivity to the implications and assistance, if necessary, with reconnecting them with their religious community for restoration of their baptized state. This is just one of many examples of religious implications for care. Unfortunately, many of these situations have been downplayed in nursing recently because of the desire to recognize spirituality apart from religion and to not stereotype individuals within religious traditions. These are certainly valid concerns. However, it is possible both to recognize the validity of spirituality and religion and to understand the possible implications of religious traditions without stereotyping.

Table 27-1 provides *possible* care considerations for some of the most common religious traditions encountered. These considerations will become even more important as Canadian society becomes increasingly diverse. Naturally, it is important to remember that this is just a starting point. This allows nurses to enter the caregiving situation with some background knowledge but is essential to clarify with each individual the practices they adhere to within their tradition. There is great variability even among common religions, and individuals will pick and choose the practices they adhere to within that religion. You need not be afraid to ask. Many religious individuals will gladly talk about their faith and practices if you are open.

► **TABLE 27-1 Religious Beliefs About Health**

Religious or Cultural Background	Possible Health Care Beliefs and Practices	Nursing Implications
Hinduism	Modern medical science is accepted. Illness is caused by past sins. Holy days are celebrated with fasting, prayer, and feasting.	Privacy is needed for prayer and meditation. Modesty in clothing is important, and hospital gowns may be considered indecent; same-sex caregivers are preferred. Important sacraments are associated with birth, naming, puberty, and death. Religious symbols should not be removed. Prayers are said twice a day; privacy is preferred. Modesty in clothing is important, and hospital gowns may be considered indecent; same-sex caregivers are preferred. Religious symbols include uncut hair, comb, steel bracelet, symbolic dagger, undershorts, and turban; these should not be removed. Cleanliness during eating and prayers is important.
Sikhism	Modern medical science is accepted. Baptized and nonbaptized Sikhs have different religious requirements.	Treatment may be refused on holy days. Prayers usually occur five times daily. Privacy is needed for meditation. The patient may want a Buddhist monk in attendance for spiritual support.
Buddhism	Modern medical science is accepted. Understanding, rather than belief, is emphasized. Dharma, the law of nature, teaches that life is impermanent and all people have to age and die. Death is usually accepted as the last stage of life, and withdrawal of life support may be permitted. Buddhists may believe in rebirth after death.	
Islam	Muslims must be able to practise the Five Pillars of Islam. Muslims may have a fatalistic view of health. Faith healing is used. Withdrawal of life support may be permitted. Autopsies are generally forbidden.	Prayers are said five times per day, facing toward Mecca. Privacy is important. Fasting may occur on holy days. Modesty in clothing is important, and hospital gowns are considered indecent; same-sex caregivers are required.
Judaism	Jews believe in the sanctity of life. God and medicine must have a balance. Observance of the Sabbath is important.	Prayers are said three times per day; men may wear prayer shawl and skull cap. Treatment may be refused on the Sabbath.
Christianity	Modern medical science is accepted. Many Christians follow complementary alternative medicine (see Chapter 34). Prayer and faith healing are used; some Christians use laying on of hands.	Times of prayer vary between individuals; privacy is preferred. Sacraments of Holy Communion and the Anointing of the Sick may be practised. Religious symbols may include cross and prayer beads.
Hutterites	Modern science is accepted. About 80% of Hutterites seek alternative therapies. All things are shared communally. Hutterites live on colonies to help avoid earthly distractions that impede spiritual practice and devotion. Praying for good health is not appropriate; rather, prayers may be for wisdom to live a healthy life or bear suffering without complaint. Created order is God over man, man above woman, elder adult above younger adult, and parent over child.	Education about health is appreciated. Straightforward discussions are preferred. Health providers are respected. Families expect to be involved in health care discussions. Decision-making processes about what health concerns are important for the colony are made by the leaders.
Ojibway (Anishinabe)	Central value is that everything belongs to everyone in extended family. Health is a spiritual experience. Disease and illness may be caused by soul loss or spiritual intrusion.	Individual decisions regarding medical treatment may be made in consultation with other members of the colony. Families generally want to be involved in health care decisions and may wish to stay with the ill individual. They desire to get to know the nurse before sharing problems. They may use Western medicine blended with traditional healing practices.

Providing Spiritual Care

Spiritual care is often overlooked in the provision of nursing care (Burkhart & Hogan, 2008; Creel, 2007; et al., 2007; Pesut & Reimer-Kirkham, 2009). Some perceived barriers to nurses offering spiritual care are perceived time constraint, lack of knowledge of the issues, lack of confidence in opening and holding spiritual conversations, challenges in articulating spirituality, uncertainty as to what spiritual care entails, and the multiplicity of beliefs, ideologies, religions, philosophies, and creeds (Hood et al., 2007). Sawatzky and Pesut (2005) caution that lack of attention to spiritual needs may cause people to abandon the traditional health care system and prevent them from drawing on inner resources for health and healing.

Spiritual nursing care, at its foundation, is an expression of self (Sawatzky & Pesut, 2005). To engage in spiritual care, you must first be comfortable with hearing about patients' spirituality. **Spiritual care** is an altruistic, relational, intuitive, and integrative process by which you seek to understand and reflect the patient's spiritual values, beliefs, and experiences (Figure 27-2; Sawatzky & Pesut, 2005): altruistic in that it requires that the nurse put the patient's need first; relational in that patients feel their spirituality is supported through an interpersonal relationship of care; intuitive in that the mysterious nature of spirituality cannot always be understood through rational thought; and finally, integrative in that spirituality should not be considered separate from the other aspects of care. The relief of suffering through excellent pain management contributes to spiritual well-being because persons are holistic.

Relational practice is a process of respectful, compassionate, and authentic inquiry into the experience of another (Doane &

Varcoe, 2005). Many of the relational capacities taught throughout nursing curricula offer support to nurses as they provide nursing care that includes the patient's spirituality (Box 27-7). The relational skills that undergird all of nursing practice are the same skills that create the foundation of spiritual care. Recognizing this may help offset feelings of inadequacy that arise when nurses think about providing spiritual care (Pesut, 2008b). According to Sawatzky and Pesut (2005), "Spiritual expressions such as love, hope and compassion constitute the most basic and universal approach to spiritual care and can be integrated into all aspects of nursing care" (p. 23). In research involving 156 cancer patients and 68 family caregivers, relationship, genuine kindness, and respect were the foundational requests of patients before receiving spiritual care (Johnston Taylor, 2007a).

Nurses grow in their ability to provide spiritual care. Expert spiritual caregivers state that "their knowledge base was acquired through the relationships that they enjoyed with patients, family, and peers" (Belcher & Griffiths, 2005, p. 275). The beginning point of spiritual care is presence and formation of relationship and a willingness to enter into conversations about what is meaningful and important to each patient. A nurse is called to transcend the tendency to generalize and

* BOX 27-7

FOCUS ON PRIMARY HEALTH CARE

Learning to Care for Spiritual Needs

One of the most important aspects of primary care is the relationship established between health care providers and patients. In this study, Canadian nurses Hood, Olson and Allen (2007) explored how practising nurses learned to care for spiritual needs. They interviewed 15 nurses ranging in age from 25 to 64 years and with 2 to 43 years of professional experience. They suggested that learning to connect was the basic social process that defined how spiritual care occurred. Connection had living, needing, nurturing, and learning elements. Participants shared that living connection was a way of being spiritual in the world that was guided by universal spiritual principles. Both patients and nurses often realized their need for connection through difficult experiences they encountered. Nurturing connection included being fully present, attending to the needs of patients, and engaging in therapeutic relationships. Finally, learning connections often entailed a process of observing, reflecting on, and testing experiences of spiritual care.

Another Canadian study led by Reimer-Kirkham, Pesut, Meyerhoff, and Sawatzky (2010) looked at the negotiation of religious and spiritual plurality in clinical health care encounters. Connecting in clinical encounters occurred in various ways. Eliciting patients' meaning systems was an important strategy for connecting. Sometimes connections occurred because of a shared religious or spiritual identity, but in other cases, connections occurred across different religious traditions as individuals showed respect and sought for common ground. Something as simple as giving physical care or eating food could be a deeply spiritually meaningful shared experience.

References: Hood, L. E., Olson, J. K., & Allen, M. (2007). Learning to care for spiritual needs: Connecting spiritually. *Qualitative Health Research*, 17(9), 1198–1206. doi:10.1177/1049732307306921. Reimer-Kirkham, S., Pesut, B., Meyerhoff, H., & Sawatzky, R. (2010). *SPIRIT: The negotiation of religious and spiritual plurality in healthcare. Final Report*. Langley, BC: Nursing Department, Trinity Western University.

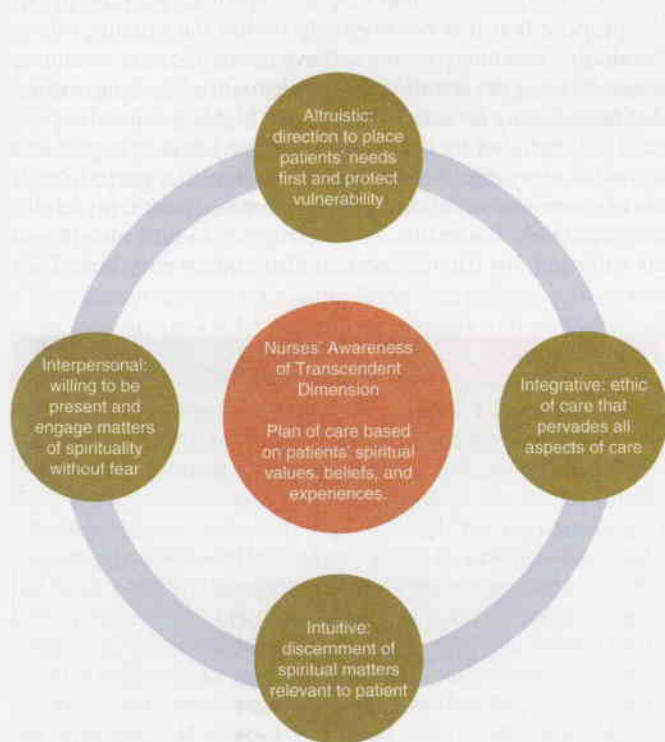


Figure 27-2 Attributes of spiritual care in nursing practice. **Source:** Adapted from Sawatzky, R., & Pesut, B. (2005). Attributes of spiritual care in nursing practice. *Journal of Holistic Nursing*, 23, 19–33. Copyright © 2005. Reprinted by permission of SAGE Publications.

make assumptions to find what truly nurtures each patient's unique spirituality. Acknowledging that the nurse does not have to be the expert in spirituality can relieve the anxiety experienced by nurses in providing spiritual care.

Facilitating Spiritual Practices

Rituals that bring meaning to life are spiritual practices. Many spiritual practices are integrated throughout a person's daily activities and do not necessarily take place in a church or formal setting. What is considered spiritual practice varies greatly from person to person, even for people of the same spiritual or religious tradition. These may be as varied as practices or sacraments associated with a person's religion, such as prayer, daily readings, or communion, and informal practices, such as enjoying a sense of connectedness with others or enjoying the beauty of nature (see Box 27-8 for examples of spiritual practices). Demystifying spiritual practice and recognizing those places in everyday life where spiritual practices are present, but not identified as such, creates awareness.

Consider for a moment the things that bring greatest meaning to your life, the times when you feel peace, you feel joy, you feel purpose. What were you doing right before you experienced those feelings? Did you pause for a moment and take a breath? Did you recognize the beauty of the garden outside your window? Did you feel gratitude for the meal before you? Did you recognize the humanity in a face before you? These are all spiritual practices and can be nurtured and grown once they are brought to awareness. Through this awareness, one can choose to consciously connect and be fully present in the moment. Being fully present in the moment, or "presence," facilitates spiritual care (Swinton & Pattison, 2010). It is important to nurture this awareness since nurses who have a spiritual base or identity are more likely to facilitate

spiritual practices and provide spiritual care in practice (Cavendish et. al, 2004; Chan, 2010).

Food and nutrition are important aspects of patient care and often an important component of some religious observances. Food and the rituals surrounding the preparation and serving of food can be important to a person's spirituality. You can consult with a dietitian to integrate the patient's dietary preferences into daily care. In the event that an agency cannot prepare food in the preferred way, the family may be asked to bring meals that accommodate dietary restrictions. Personal care of the patient should be planned to allow time for religious readings, visits by spiritual advisors, or attendance at religious services. Some churches and synagogues offer audiotapes of their services for those members who cannot attend in person. Family members can plan a prayer session or an organized reading of religious material on a regular basis. Arrangements may need to be made with spiritual care staff for the patient and family to receive the sacraments. Clergy will routinely offer to make home visits for people unable to attend religious services. Taped meditations, classical or religious music, and televised religious services are other options. You should be respectful of icons, medals, prayer rugs, or crosses that patients bring to a health setting; be sure that they are not accidentally lost, damaged, or misplaced (see Nursing Story, Box 27-9).

Reflecting on Nurses' Spiritual Care

Growing along the journey of spirituality is a lifelong pursuit, and one that is not easily evaluated by others. Particularly during times of illness and suffering, patients need to clarify values, to reshape philosophies, to strengthen relationships, and to live experiences that help to shape their purpose in life. We propose that it is not normally within the nursing role to "evaluate" whether patients achieve connectedness, meaning, peace, hope, or other indicators of spirituality. Meaning making during suffering is often a mysterious, highly personal experience as illustrated by the following story. Job is character in a Christian story about suffering. Job comes to a period in his life of enormous suffering when he loses his wealth, his family, and ultimately his health. As he struggles to find meaning in his suffering, his friends come to visit and sit with him. They

► BOX 27-8 Examples of Spiritual Practices

Meditation
Contemplation
Prayer
Gratitude
Presence
Mantra
Yoga
Tai chi
Qui gong
Reflection
Ritual participation
Sacred readings
Incense use
Active listening, guidance
Journalling
Service
Exercise
Listening to music
Worship
Affirmations
Solitude
Study
Fasting
Simplicity
Confession

BOX 27-9 NURSING STORY

The meaning held in a simple act of respect for a patient's important religious symbol was taught to me by two first-year nursing students. On a busy morning in residential care, Maria,* an elderly female resident, was distracted and anxious because the religious medals that she always wore next to her heart were missing. The two students found out from the staff that the medals had been missing for several days, and they were advised to simply get the patient dressed and to the dining room. The students, understanding the sense of peace these medals brought to Maria, became determined to find them. They did indeed find the medals. As they returned the medals to their special place next to Maria's heart, her affect turned from worry to joy. Maria was transformed by the caring actions of the students. In the weeks that followed, Maria's face lit up when these students came into her room. With this simple act, the students had provided the spiritual care that was needed in the moment.

*Pseudonym.

* BOX 27-10

EVIDENCE-INFORMED
PRACTICE GUIDELINE**The “Little Extra” That Alleviates Suffering**

What is the ethical ideal of nursing care that reduces suffering? That is the question asked by some Swedish nurses. They engaged in a Socratic dialogue with six experienced nurses and four nursing students in their last year of undergraduate study. A Socratic dialogue entails a mutual discussion aimed at allowing participants to explain their ethical outlook on life. In addition, they interviewed two cancer patients.

The experienced nurses believed that “ideal care means seeing the whole person, giving them respect and acting accordingly: being able to see the person delivers the caring acts. Evidence of this can be seen in the carers’ willingness to give the little extra” (p. 376).

The nursing students believed that “ideal care means acknowledging and being touched by the other person’s situation as a fellow being. Evidence of this is extra commitment to individuals and acting according to their needs” (p. 377).

The patients suggested it is the “power or magic in genuine commitment and interest. You are a person not a diagnosis” (p. 377).

The authors concluded that ideal nursing care goes beyond—to give that little extra. This willingness and ability often arise from the caregiver’s own progression in the understanding of life, which allows them to open up to the patient’s suffering and vulnerability. Ultimately, they conclude that it is often the small acts that preserve patient dignity because patients feel cared for and valued.

Those little extras are an important part of spiritual care.

Source: Arman, M., & Rehnsfeldt, A. (2007). The “little extra” that alleviates suffering. *Nursing Ethics*, 14(3), 372–386.



mean well, but as they sit and observe his plight, it becomes too much for them. Each of them tries to understand the meaning of his suffering so that they can make it right for him. They propose all kinds of causes for his suffering and ways that he can make it better. But their good intentions only cause him further distress. Ultimately, he never finds answers to his plight but finds great comfort in God.

As nurses, we can take some important guidance from this story. We can always be present for patients in their suffering, and certainly we can do everything within our power to alleviate distress (see Box 27-10). We should aggressively treat pain and other symptoms. We should provide a hospitable climate for those who are most important in patients’ lives. We should put great effort into ensuring that patients can continue with their religious and spiritual practices. We should know the values and beliefs that are important to take into account as part of the overall picture of care. These are all spiritual “interventions.” But we need to be cautious about entering into the areas of mystery, particularly if we are sensing our own need to explain or control patients’ suffering.

In this aspect of nursing care, it is more appropriate to reflect on your own contributions to a healing relationship. Were patients’ spiritual practices respected? Was the relationship characterized by caring and support? Does the patient express trust and confidence in you? Is the patient able to discuss important issues or topics? Is the patient comfortable expressing spiritual needs to you? That sense of rapport that develops within a nurse–patient relationship is often the best

indicator that you have helped to provide a safe context within which patients can live their spiritual journey.

✦ **KEY CONCEPTS**

- Spirituality is highly personal and unique to each individual.
- Nurses must be aware of their own spirituality in order to recognize the spirituality of others.
- Canadian nursing practice has a rich spiritual heritage that has influenced contemporary practice.
- Spirituality may have beneficial health outcomes.
- Body, mind, and spirit are interconnected; thoughts, expectations, and beliefs may affect physical well-being.
- Nursing theories can guide nurses in providing spiritual care.
- Faith is a relationship with God or a higher power or authority that enables action and gives purpose and meaning to an individual’s life.
- Religion is a system of organized beliefs and worship that a person practises to express spirituality outwardly.
- Spirituality is a lifelong journey that may reflect the age and life experiences of the patient, as well as their current context.
- When patients experience acute or chronic illness or a terminal disease, spiritual resources either help a person recover or spiritual concerns develop.
- Spiritual practices are varied and may include private worship, prayer, meditation, sacraments, singing, use of rosary or prayer beads, and reading religious texts.
- Critical thinking in spiritual care includes an understanding of the unique perspective of the patient.
- A spiritual assessment is most successful when nurses attempt to understand rather than assess patients’ spirituality, allowing the development of the relationship.
- Spiritual assessment tools should be flexible, and the depth of the assessment must be sensitive to the circumstances.
- The personal nature of spirituality requires open communication and the establishment of trust between nurse and patient.
- Certain religions may have dietary restrictions or beliefs and practices of health care that may have implications for nursing practice.
- Spiritual practices may be an effective coping resource for physical and psychological symptoms.
- Providing spiritual care may result in an increased or restored sense of connectedness with significant others and maintaining, renewing, or reforming a sense of purpose in life.

✦ **CRITICAL THINKING EXERCISES**

1. Mr. Gadacz is a 40-year-old businessman with more than 100 employees. A 12-hour workday is not unusual for him. He is married, has four teenage children, and is solely responsible for providing financially for the family. Last evening, he was admitted to the cardiac care unit with severe chest pain resulting from a myocardial infarction (heart attack). He is now stabilized but frequently asks about his diagnostic tests and what he needs to do to be able to go home. He tells his nurse, “My doctor tells me I will need surgery once I am more stable. I hope he can do that soon. I just can’t believe this is happening. I worry about what will happen to my business while I am gone and to my family if I can’t keep my business going.” He asks you, “Could I die from this?” You notice that Mr. Gadacz has devotional literature at his bedside. How might you go about conducting a spiritual health assessment for Mr. Gadacz?
2. Tejal is a new graduate nurse caring for Ms. Rosenbaum for the first time. Ms. Rosenbaum is 27 years old and has recently received a diagnosis of uterine cancer. She is scheduled for

an abdominal hysterectomy. Tejal notices from the patient chart that Ms. Rosenbaum has identified herself as Jewish. What factors might be important to consider in relation to Ms. Rosenbaum's spirituality or religion for the plan of care? How might Tejal determine which factors are relevant for Ms. Rosenbaum?

3. Critical thinking is an ongoing process. When you learn that you are assigned to care for Fangzhou Lin, you note that the Kardex information includes his religion (Buddhist) and his place of birth (Hong Kong). A colleague tells you he can speak some English. The patient is 80 years old and reportedly has a hearing deficit. What knowledge might you wish to reflect on critically before beginning a spiritual assessment of this patient?

✦ REVIEW QUESTIONS

1. Caring for a patient's spiritual needs means
 1. Having the same beliefs as the patient
 2. Praying for the patient
 3. Accepting the patient's beliefs and experiences
 4. Calling for a religious leader if you determine a need
2. An individual who does not believe in the existence of God is an
 1. Agnostic
 2. Atheist
 3. Anarchist
 4. Agenic
3. Patients' rituals and practice
 1. Have no place in modern medicine
 2. Have no place in the hospital
 3. Can get in the way of nursing care
 4. Provide structure and support for the patient
4. Establishing presence is not simply being in the same room with a patient; it also involves
 1. Offering a closeness with the patient: physically, psychologically, and spiritually
 2. Performing procedures
 3. Touching the patient
 4. Sharing your own beliefs as a way to bring comfort
5. For those adhering to the Hindu religion, it is important to consider that
 1. Modern medical practice is not accepted
 2. Followers may observe fast days
 3. Opposite sex caregivers are permitted
 4. Removing religious symbols is permissible
6. Spirituality is
 1. A structured search for God
 2. Completely different than religion
 3. An appropriate term to use to describe atheists
 4. Commonly identified with meaning, purpose, hope, and connectedness
7. Research has shown that patients appreciate all of the following from the nurse, *except*
 1. Intimate interventions such as meditation or journaling
 2. Supporting personal spiritual interventions
 3. Doing the little "extras"
 4. Knowing about their spirituality and spiritual concerns

8. Patients who experience terminal illness or who have suffered a recent disability because of a disease or injury can benefit from
 1. Grief work
 2. Diet therapy
 3. Acupuncture
 4. Values clarification
9. Spiritual assessment
 1. Should be structured and follow specific process
 2. Is not required or recommended
 3. Is the first component of the nursing process
 4. Should be flexible and the depth of the assessment must be sensitive to the circumstances
10. Relational practice
 1. Causes tension between the nurse and the patient if they hold conflicting beliefs
 2. Creates the environment for spiritual care
 3. Allows nurses to establish clear boundaries
 4. Is not a component of spiritual care

✦ RECOMMENDED WEB SITES

Institute for the Biocultural Study of Religion: http://www.ibcsr.org/index.php?option=com_content&view=article&id=124:ibcsr-research-review-200907-200909&catid=55:research-review&Itemid=86

This organization produces a regular annotated bibliography of the recent research in the field.

Canadian Association for Parish Nursing Ministry: <http://www.capnm.ca>

The Canadian Association for Parish Nursing Ministry is committed to the development of parish nursing as a health and ministry resource within Canada.

Center for Spirituality and Healing: <http://www.csh.umn.edu>
Established in 1995 at the University of Minnesota in the United States, the Center for Spirituality and Healing provides education about integrative medicine, combining biomedical, complementary, cross-cultural, and spiritual care.

Center for Spirituality, Theology and Health: <http://www.dukespiritualityandhealth.org>

The purpose of this centre, which is part of Duke University in the United States, is to conduct research on the effects of spirituality on physical and mental health.

Nurses Christian Fellowship: <http://www.ncf-jcn.org>

Nurses Christian Fellowship, a US institution, is a Christian organization with the goal of integrating Christianity into nursing care. This Web site contains information about the scope and trend of research related to spiritual care. The Canadian chapter of Nurses Christian Fellowship can be found at <http://www.ncfcanada.ca/>.

Spirituality in Health-Care Network: <http://www.spiritualityinhealthcare.net/links.html>

This site provides links to a number of other resources.

Review Question Answers

1. 3; 2. 2; 3. 4; 4. 1; 5. 2; 6. 4; 7. 1; 8. 4; 9. 4; 10. 2

Rationales for the Review Questions appear at the end of the book.

The Experience of Loss, Death, and Grief

Original chapter by Valerie Yancey, RN, PhD

Canadian content written by Jim Hunter, RN, MSN

objectives

Mastery of content in this chapter will enable you to:

- Define the key terms listed.
- Identify your role in assisting patients who have experienced loss, death, and grief.
- Describe and compare the phases of grieving from Kübler-Ross (1969), Bowlby (1980), and Worden (1991).
- List and discuss the five categories of loss.
- Describe the types of grief.
- Describe the characteristics of a person experiencing grief.
- Discuss variables that influence a person's response to grief.
- Develop a nursing care plan for a patient or family experiencing loss and grief.
- Explain reasons for the need for improved end-of-life care for patients.
- Discuss principles of palliative care.
- Describe how to involve family members in palliative care.
- Describe the procedure for care of the body after death.
- Discuss your own loss experience when caring for dying patients.

key terms

- | | |
|-------------------------------------|--------------------------------|
| Acceptance, p. 449 | Hope, p. 452 |
| Actual loss, p. 448 | Hospice, p. 466 |
| Anger, p. 449 | Maturation loss, p. 448 |
| Anticipatory grief, p. 450 | Necessary losses, p. 448 |
| Bargaining, p. 449 | Numbing, p. 449 |
| Bereavement, p. 449 | Palliative care, p. 463 |
| Denial, p. 449 | Perceived loss, p. 448 |
| Depression, p. 449 | Postmortem care, p. 467 |
| Disorganization and despair, p. 449 | Reorganization, p. 449 |
| Grief, p. 449 | Situational loss, p. 448 |
| Health care proxy, p. 455 | Yearning and searching, p. 449 |

media resources

evolve WEBSITE

<http://evolve.elsevier.com/Canada/Potter/fundamentals/>

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- Examination Review Questions
- Glossary
- Student Learning Activities
- Weblinks

Loss and grief are experiences that affect not only patients and their families, but the nurses who care for them as well. In Canada and other Western societies, palliative and end-of-life care continues to develop its role in health care and gain acceptance, despite barriers that include a focus on the more dominant medical model, where the focus is on cure (Melvin & Oldham, 2009). As a result, Canadians often deny death, as well as the need to express grief and to feel the pain associated with a loss, both of which are beneficial to healing. Grief affects survivors physically, psychologically, socially, and spiritually as a result of very real concrete and perceived losses. Death of a patient, for example, leaves family, friends, and caregivers feeling powerless. Most nurses enter the profession with the intent of helping patients recover from illness, adjust to illness-related changes in lifestyle, and move toward health restoration. It is often frightening to learn that knowledge, skill, and technology do not always result in cure.

Your role in facilitating the grief process includes assisting survivors to feel the loss, express the loss, and complete the stages of the grief process. To be effective, you must have a thorough understanding of a patient's loss, its significance and meaning to the patient and family, and how it affects the patient and family's ability to carry on. Providing care for patients in crisis from loss or during the end of life requires knowledge, caring, and compassion to help bring comfort to patients and families, even when hope for a cure is gone. Helping patients to a peaceful, dignified death is an important aspect of your nursing care. Although working with dying patients can be challenging, many nurses also find it to be a rewarding and often life-changing experience, both professionally and personally (Chochinov, 2006).

Scientific Knowledge Base

Loss

Throughout their lives, people form attachments and suffer losses. They develop independence from their parents, start and leave school, change friends, begin careers, and form relationships. The growing-up process is natural and positive, and yet as people's lives unfold, they suffer necessary losses (Hasler, 1996). **Necessary losses** are an integral part of each person's life. People expect their losses to be recovered and replaced by something different or better, but other losses cause an unbearable change in their sense of safety and security (Hasler, 1996). Losses such as the death of a loved one, divorce, or loss of independence are significant and can have long-term effects on physical and psychological health. Loss comes in many forms, depending on the values and priorities learned within a person's sphere of influence, made up of family, friends, society, and culture. A person experiences loss in the absence of an object, person, body part or function, emotion, or idea that was formerly present (Table 28-1). Losses may be actual or perceived. An **actual loss** is any loss of a person or object that can no longer be felt, heard, known, or experienced by the individual. Examples are the loss of a body part, a child, a relationship, or a role at work. Lost objects that have been valued by a patient could be any possession that is worn out, misplaced, stolen, or ruined. For example, a child may grieve over the loss of a favourite toy. A **perceived loss** is any loss that is defined uniquely by the grieving patient. It may be less obvious to others. An example is the loss of confidence or prestige. Perceived losses are easily overlooked or misunderstood, and yet the process of grief follows the same sequence and progression as that for actual losses. Individual interpretation makes a difference in how the perceived loss is uniquely valued and the response that a person will have during grieving.

Losses may also be maturational, situational, or both. A **maturational loss** is any change in the developmental process that is normally expected during a lifetime. One example would be a parent's feeling of loss as a child goes to school for the first time. Events associated with maturational loss are part of normal life transitions, but the feelings of loss persist as grieving helps a person cope with the change. **Situational loss** is any sudden, unpredictable external event. Often this type of loss includes multiple losses rather than a single loss; for example, an automobile accident may leave a driver paralyzed, unable to return to work, and grieving over the death of a passenger in the accident.

The type of loss and the perception of the loss influence the depth and duration of grief that a person experiences. Each

► TABLE 28-1 Types of Loss

Definition	Implications of Loss
Loss of external objects (e.g., loss, misplacement, deterioration, theft, destruction by natural causes)	Extent of grieving depends on object's value, sentiment attached to it, and its usefulness.
Loss of known environment (e.g., moving from a neighbourhood, hospitalization, leaving or losing a job, moving out of intensive care unit)	Loss occurs through maturational or situational events and through injury or illness. Loneliness or newness of an unfamiliar setting threatens self-esteem and makes grieving difficult.
Loss of a significant other (e.g., through being promoted, moving, or running away; loss of a family member, friend, trusted nurse, acquaintance, or animal companion)	Significant other typically fulfills another person's need for psychological safety, love and belonging, and self-esteem.
Loss of an aspect of self (e.g., body part, psychological function, or physiological function)	Illness, injury, and developmental changes result in loss of aspect of self that causes grief and permanent changes in body image and self-concept.
Loss of life (e.g., death of family members, friend, or acquaintance; own death)	Loss of life creates grief for the survivors. The person facing death often fears pain, loss of control, and dependency on others.

individual responds to loss differently. It is incorrect to assume that the loss of an object does not generate the same level of grieving as the loss of a loved one. The value an individual places on the lost object (e.g., a family heirloom) determines the emotional response to the loss. You must assess the special meaning that a loss has for a patient and validate its effect on the patient's health and well-being.

Hospitalization, chronic illness, and disability are special circumstances that are associated with multiple losses. When patients enter a hospital, they lose their privacy, control over their daily routines, and any illusions that they may have about their personal indestructibility. In addition, modesty and control over bodily functions may be compromised. A chronic illness or disability often engenders concern over financial security. Furthermore, long-term illness may necessitate a job change, threaten independence, and force alterations in lifestyle. Even a brief illness or hospitalization necessitates temporary shifts in family role functioning. Chronic or debilitating illness may pose a major threat to the stability of relationships.

Death is the ultimate loss. Although death is part of the continuum of life and a universal and inevitable part of being human, it is also a mystical event that generates anxiety and fear. Death ends relationships and separates people. Even with a strong spiritual grounding, facing death is often difficult for the dying person, as well as for the person's family, friends, and caregivers. A person's terminal illness reminds close

friends and associates of their own mortality. A person with an advanced, progressive, ultimately fatal illness, such as chronic renal failure, end-stage heart failure, amyotrophic lateral sclerosis, or metastatic cancer, faces many—often progressive—levels of suffering. It is difficult to be sick, and many people dislike seeking help from others; however, nearly all want companionship and want to strengthen relationships with significant others when death is imminent (Chochinov, 2006).

When faced with death, feelings of guilt, anger, and fear arise. It may cause family members and caregivers to withdraw at a time when the dying person needs a trusted, unhurried companion, acting with gentle advocacy and humility. Patients faced with death are increasingly choosing to die at home (National Consensus Project [NCP], 2009); as a result, family members are becoming more involved in the care of their loved one. The way a person approaches dying is influenced by personal fundamental beliefs and values, past experiences with death, culture, spirituality, and the quality of the human emotional support available.

Grief

Grief is the emotional response to a loss or death (Waldrop, 2007). Each individual responds to loss differently, grieving at an individual pace and pattern (Corless, 2010). Differences are based on individual experience, previously established coping strategies, cultural expectations, and spiritual beliefs (see Chapters 9 and 27) and involve the process of mourning and the process of adapting to a loss (Waldrop, 2007). It involves working through the grief until an individual accepts and adapts to his or her expectations to find meaning in the loss, and to go on in life without that which was lost (Corless, 2010).

Bereavement includes grief and mourning; it is the state of having lost a significant other to death (Waldrop, 2007). Survivors go through a bereavement period that is not linear. It does not proceed in sequential stages that can be precisely predicted, which may imply passivity on the part of the bereaved person. Rather, a survivor will move back and forth through a series of stages, tasks, or both many times, possibly over a period of several years, before the process is completed. Although no one really “gets over” a loss, the individual can heal and adapt to the loss. A useful analogy is to think of a new ring on a finger. Initially, the wearer is always aware that it is there, but over time, it will be less noticeable and yet still present. Several theorists have formulated stages of the grieving process as a series of tasks for survivors to work through their bereavement and adapt to life with a loss.

Selected Theories of Grief

Kübler-Ross's Stages of Grief. The framework for Kübler-Ross's (1969) theory is behaviour oriented and has five stages (Table 28-2). During **denial**, an individual acts as though nothing has happened and may refuse to believe or understand that a loss has occurred. In the **anger** stage, the individual resists the loss and may strike out at everyone and everything. During **bargaining**, the individual postpones awareness of the reality of the loss and may try to deal in a subtle or overt way as though the loss can be prevented. A person finally realizes the full impact and significance of the loss during the stage of **depression**, when the individual may feel overwhelmingly lonely and withdraw from interpersonal interaction. Finally, during the **acceptance** stage, the individual accepts the loss and begins to look to the future. Although these stages are valuable for novice nurses to understand the grief process, stage or phase theories may be seen as having

► TABLE 28-2 The Grief Process

Kübler-Ross's (1969) Five Stages of Grief	Bowlby's (1980) Four Phases of Mourning	Worden's (1991) Four Tasks of Mourning
Denial	Numbing	Accepting the reality of loss
Anger	Yearning and searching	Working through the pain of grief
Bargaining	Disorganization and despair	Adjusting to the environment without the deceased
Depression	Reorganization	Emotionally relocating the deceased and moving on with life
Acceptance		

limitations in some situations, because in reality, the stages and phases of grief may occur nonsequentially or may overlap (Buglass, 2010).

Bowlby's Phases of Mourning. Bowlby's (1980) attachment theory is the foundation for his theory on mourning. Attachment is described as an instinctive behaviour that leads to the development of affectionate bonds between children and their primary caregiver. These bonds are present and active throughout the life cycle. Later, the bonds are generalized to other people with whom individuals form close relationships. Attachment behaviour ensures human survival because it keeps people in close contact with other people who can offer protection and support.

Bowlby (1980) described four phases of mourning (see Table 28-2). As in the case of the other grief theories, a person can move back and forth between any two of the phases while responding to the loss. The **numbing** phase may last from a few hours to a week or more and may be interrupted by periods of extremely intense emotion. It is the briefest phase of mourning. The grieving person may describe this phase as feeling “stunned” or “unreal.” Numbing may serve to protect the body from the onslaught or consequence of the loss. The second phase of **yearning and searching** arouses emotional outbursts of tearful sobbing and acute distress in most people. Corless (2010) describes how it is necessary for the bereaved person to experience the pain of grief in order to finish the work of grief, through finding meaning in the loss. Therefore, anything that continually allows the person to avoid or suppress the pain can be expected to prolong the course of mourning. Common physical symptoms are tightness in the chest and throat, a shortness of breath, feelings of weakness and lethargy, insomnia, and loss of appetite. A person may also experience an intense yearning for the object or individual who is lost. This phase may last for months or years. During the phase of **disorganization and despair**, an individual may constantly examine how and why the loss occurred. It is common for the person to express anger at anyone who might be responsible. This examination gradually gives way to an acceptance that the loss is permanent. During the final phase of **reorganization**, which may require as much as a year or more, the person begins to accept unaccustomed roles, acquire new skills, and build new relationships. People experiencing

this phase must be encouraged to find meaning and hope in their loss, without lessening its importance (Corless, 2010).

Worden's Four Tasks of Mourning. Worden's (1991) four tasks of mourning imply that people who mourn can be actively involved in helping themselves and can be assisted by outside intervention. Although time varies greatly among individuals, working through the tasks typically requires a minimum of a full year.

- *Task 1: To accept the reality of the loss.* Even when a death has been expected, some period of disbelief and surprise that the event has really happened always occurs. This task involves the processes required to accept that the person or object is gone and will not return.
- *Task 2: To work through the pain of grief.* Even though people respond to loss differently, it is impossible to experience a loss and work through grief without emotional pain. Individuals who deny or shut off the pain prolong their grief.
- *Task 3: To adjust to the environment in which the deceased is missing.* According to Worden (1991), a person does not realize the full impact of a loss for at least three months. At this point, many friends and associates make less frequent contact, and the person is left to ponder the full impact of loneliness. People completing this task must take on roles formerly filled by the deceased, including some tasks that they never fully appreciated.
- *Task 4: To emotionally relocate the deceased and move on with life.* The goal of this task is not to forget the deceased or give up the relationship with the deceased but to have the deceased take a new, less prominent place in a person's emotional life. This is often the most difficult task to complete because people fear that if they make other attachments, they will forget their loved one or be disloyal. A person completes this stage after realizing it is possible to love other people without loving the deceased less.

Types of Grief. Knowledge of types of grief, which are based on characteristics or signs and symptoms of grief, enables you to implement appropriate bereavement therapies.

Normal Grief. Normal or uncomplicated grief consists of the normal feelings, behaviours, and reactions to a loss, including resentment, sorrow, anger, crying, loneliness, and temporary withdrawal from activities. Often the "healthy" grief response to a loss can prove positive, helping an individual mature and develop as a person as he or she comes to terms with the changes that have occurred in his or her life and works to rearrange and reorganize internal models (Grassi, 2007). This results in the development of adaptive coping strategies on which the person can rely in the future.

Anticipatory Grief. The process of disengaging, or "letting go," that occurs before an actual loss or death has occurred is called **anticipatory grief**. For example, once a person or family receives a terminal diagnosis, they begin the process of saying goodbye and completing life affairs. The process becomes more stressful when the patient is unable to make decisions as a result of the progression of illness. Unless guided by a patient's explicit decisions regarding end-of-life care, the family, in consultation with health care providers, assumes the responsibility of deciding whether to continue life-sustaining measures. The family must weigh factors such as the patient's known values and choices, the medical facts, opinions and probabilities, the burden of treatment, the expected future quality of life for the patient, and the limitations of their own emotional resources (Radwany et al., 2009).

When dying takes a long time, the patient's loved ones may exhibit few symptoms of grief once the death occurs. This seeming absence of grief symptoms may result because the family has engaged in the grief process over time. By the time the moment of death arrives, much of the shock, denial, and tearfulness have already been experienced.

Anticipatory grieving entails some risks. Family members may withdraw emotionally from the patient too soon, leaving the patient with no emotional support as death approaches. Complications may also arise if a person who was thought to be near death survives. Family members may then have difficulty reconnecting and may even be resentful that the person has lived past life expectancy.

Complicated Grief. When a person has difficulty progressing through the normal (generally accepted) phases or stages of grieving, bereavement becomes complicated. In these cases, bereavement appears to "go wrong" and loss has not been adequately dealt with. This can threaten a person's relationships with others. Complicated grief includes these four types:

- *Chronic grief:* Active acute mourning characterized by normal grief reactions that do not subside and continue over very long periods and that becomes complicated mourning (Worden, 2009). Affected people verbalize an inability to "get past" the grief. This may also be known as unresolved grief, or complicated grief. Coping strategies implemented during complicated grief tend to be maladaptive (Worden, 2009).
- *Delayed grief:* Characterized by normal grief reactions that are suppressed or postponed and by the survivor's conscious or unconscious avoidance of the pain of the loss (Worden, 2009). Active grieving is held back, only to resurface later, usually in response to a trivial loss or upset. For example, a wife may appear to grieve for only a few weeks after the death of her spouse, but then she may become distraught and sad when a minor event triggers emotion. The extreme sadness is a delayed response to the death of her husband. Multiple losses can cause the grieving to be delayed (Worden, 2009).
- *Exaggerated grief:* Grief that overwhelms people to the point that they cannot function. This may be reflected in the form of severe phobias or self-destructive behaviour such as alcoholism, substance abuse, or suicide.
- *Masked grief:* Lack of awareness by survivors that behaviours that interfere with normal functioning are a result of their loss. For example, a person who is grieving may exhibit physical or psychiatric symptoms; some people have been known to exhibit delinquent behaviours (Worden, 2009).

Disenfranchised Grief. People experience grief when a loss is experienced and cannot always be openly acknowledged, socially sanctioned, or publicly shared due to stigmatization (Worden, 2009). Examples are the loss of a partner from acquired immunodeficiency syndrome (AIDS), the loss of a child in utero or at birth, or the loss of a family member through suicide.

Application of Grief Theory to Other Types of Loss. Although grief theories apply mainly to the way that individuals cope with the death of a loved one, they also apply to other losses. The theories are relevant to the way people respond to a loss of body function, as in the case of organ transplantation or heart attack, and to disability, such as amputation of a limb or paralysis. Grief theory applies to individuals who progress through stages of mourning for lost

independence, body integrity, and a change in body image. These individuals experience genuine emotional pain as they progress through the stages of grieving.

Nursing Knowledge Base

Nursing knowledge has traditionally focused on the acute care setting, in which losses are more physical in nature. As you enter home and community settings, the definitions of loss are more comprehensive and in many ways different. You must develop interventions for each unique patient situation.

Factors Influencing Loss and Grief

The way that an individual perceives a loss and responds to it during bereavement is influenced by many factors.

Human Development. People of differing ages and stages of development display different and unique symptoms of grief. For example, toddlers are unable to understand loss or death, but they feel great anxiety over the loss of objects and separation from parents. School-aged children experience grief over the loss of a body part or function. They often associate misdeeds with causing death. Middle-aged adults usually begin to re-examine life and are sensitive to their own physical changes. Older adults often experience anticipatory grief because of aging and the possible loss of self-care abilities. Aging is frequently associated with losses such as physical changes, loss of employment, loss of social respect, loss of relationships, and threats to a sense of fulfillment and contributions made in life. Older adults are often resilient in responding to grief, despite its being a highly stressful process (Box 28-1); however they are also more likely to experience dysfunctional grieving (Worden, 2009).

Psychosocial Perspectives of Loss and Grief. Loss and death are life experiences that each person faces. Death is an overwhelming experience that affects everyone involved in the loss situation or in the death of the individual. Culture can

have a significant influence on people's views of death and how the dying should be cared for. In each culture is a set of beliefs and values that are the result of positive and negative experiences, cultural influences, and spiritual beliefs (Verosky, 2006). You are part of that same psychosocial environment and share many of the biases or perspectives gained during sociological development. Norms for psychosocial patterns of loss and grief are reflected in caregivers as well as in patients. You need to be aware of your own personal perspectives that may influence your approach and attitudes in caring for dying patients and their families (Verosky, 2006).

An individual's expression of grief evolves as the person matures. Personal experiences shape the coping mechanisms that the individual uses to deal with stressors. As psychologists explain, the coping mechanisms that were effective in the past are repeated as a first response to the pain of a loss. When older coping strategies are unsuccessful, new coping mechanisms are attempted (see Chapter 29). When faced with a loss, a patient learns what is needed for his or her own coping through repetition that is based on the successes and failures of different coping mechanisms. Sometimes the number or depths of losses become overwhelming, and familiar coping styles are not successful. For example, in the case of disenfranchised grief, society has different expectations than the person who experiences the loss, and routine coping strategies become ineffective, unavailable, or maladaptive. Professional assistance is often required to help the patient and family understand and deal realistically with losses.

Socioeconomic Status. Socioeconomic status influences a person's ability to obtain options and use support mechanisms when coping with loss. In general, people feel greater burden from a loss when financial, educational, or occupational resources are lacking. For example, a patient with limited finances may not be able to replace a home lost in a fire or may not be able to purchase necessary medications to manage a newly diagnosed disease. These patients require referral to community social service and support agencies that can provide needed resources.

Personal Relationships. When loss involves a loved one, the quality and meaning of the relationship are critical in understanding a survivor's grief experience. It has been said that to lose parents is to lose the past, to lose a spouse is to lose the present, and to lose a child is to lose the future. When a relationship between two individuals has been very close, the one left behind can have great difficulty coping. Support from family and friends is based, in part, on the person's relationships with members of a social network and the manner and circumstances of the loss. People who do not receive support and compassion from others may have difficulty grieving.

Nature of the Loss. The ability to manage grief depends on the meaning of the loss and the situation surrounding the loss. A bereaved person's ability to accept help from others influences whether he or she will be able to cope. The visibility of a loss influences the support a person receives. For example, the loss of one's home from a fire prompts support from the community, whereas a private loss of an important possession may prompt less support from others. Some losses are not highly visible, such as reproductive loss (e.g., miscarriage, stillbirth, abortion, giving up a child for adoption, infertility).

The suddenness of a loss can delay resolution from grief. For example, a sudden and unexpected death is generally more difficult for a family to accept than death after a long-term chronic illness.

* BOX 28-1 FOCUS ON OLDER ADULTS

- Bereavement adjustments are multidimensional in that nearly every aspect of a person's life can be affected by a loss. Examples are decreased social support from friends and family, and potential changes in housing.
- The overall effect of bereavement on the physical and mental health of many older spouses is not as devastating as expected. Some losses at this stage are seen as more appropriate than for younger adults.
- Older bereaved spouses commonly experience both positive and negative feelings simultaneously; however, they are at increased risk for depression.
- Loneliness and problems associated with completing the tasks of daily living are two of the most common and difficult adjustments for older bereaved spouses. Older persons are more likely to have already lost siblings or other family members, which may affect available social support and social support networks.
- Older bereaved adults adjust to the deaths of spouses in diverse ways.



Data from Worden, J. W. (2009). *Grief counseling and grief therapy: A handbook for the mental health practitioner* (4th edition). New York: Springer.

Culture and Ethnicity. A person's cultural background strongly influences attitudes toward life-sustaining treatments during terminal illness (Verosky, 2006). Cultural background and family practices also influence people's interpretation of a loss and expression of grief (Box 28-2). Culture affects how patients and their support systems or families respond to loss (see Chapter 9). For example, in the Western hemisphere, the

* BOX 28-2 CULTURAL ASPECTS OF CARE

At the end of life, rituals, mourning practices, and specific expressions of grief are necessary for participants of all cultures, in order to have a sense of acceptance and inner peace. Whether appropriate care at the end of life achieves a "good death" or an "acceptable death" for patients is controversial.



Do patients achieve a sense of comfort and peace during the death experience? Most hospital policies and procedures support an "acceptable death"—nontheatrical, disciplined, and with minimal exchange of emotions—for the patient who is dying. This means providing basic standard levels of care and support, which may or may not take into account a patient's cultural beliefs and practices. A "good death" or "acceptable death" is also known as a "meaningful death" and can be defined as a dying process "during which the patient is physically, psychologically, spiritually and emotionally supported by his or her family, friends, and caregivers" (Chochinov, 2006, p. 85). In contrast, Gillick (2009) describes a desirable death in some family or cultural situations as one that allows social adjustments and personal preparations for the transition that will occur. A good death will be perceived by families as withholding painful truths from the family member. By withholding specific illness or treatment information, the family may feel they are trying to protect their relative from suffering (Gillick, 2009). In these situations, the value of autonomy may be in conflict with culture and tradition. The disengagement that occurs between the person who is dying and loved ones takes many forms because of cultural differences:

- Some Asian Americans, Latinos, and Orthodox Jews believe that telling a person they have a terminal diagnosis will precipitate death.
- Asking patients if they would like more information on their condition or if they prefer you or the physician to speak to the substitute decision maker may be a compromise between cultural values and patient autonomy.
- Families who try to conceal painful truths or otherwise seem at odds with core nursing values such as autonomy see themselves as trying to protect their family member from suffering.
- All cultures will hold individual and varying preferences regarding treatment, involvement of family, sharing of information, and care of the dying and deceased.

Implications for Practice

- Your nursing concept of social support must be broadened to include greater variation in the timing, form, and mode of support provided to grieving patients and families.
- Cultural beliefs influence who makes up a patient's support network and what support is acceptable to both give and receive during death.
- It is not important for you as a nurse to be an expert in all cultures, but it is a necessity to identify what is culturally important or significant for the individuals and families you work with.

Data from Gillick, M. (2009). Decision making near life's end: A prescription for change. *Journal of Palliative Medicine*, 12(2), 121–125.

grieving process is usually personal and private; individuals show restrained emotion. However, the ceremonies surrounding a person's death offer time for grief resolution and reminiscing. In Eastern hemisphere nations, such as the Philippines or China, respect for the dead is shown by wailing and physically demonstrating grief for a specified period. Despite these trends, members of the same ethnocultural background may respond to loss and death differently. You must acquire an understanding and appreciation of each patient's cultural values as they apply to the experience of loss, death, and grieving.

Canada is a multicultural society, and as a nurse, you can anticipate many cultural contexts and responses to loss, death, and bereavement. You must be able to support and guide patients and families through the end-of-life process in a culturally informed and acceptable manner. Culturally sensitive practices are needed to guide the development of effective nursing interventions. When individuals lose control over aspects of their life because of illness, you must provide respectful and appropriate culturally safe care to individual patients. This is best achieved through asking specific questions of the patient or the family (Verosky, 2006).

Spiritual Beliefs. Individuals' spirituality significantly influences their ability to cope with loss. Some of the spiritual resources on which patients may depend during a loss include faith in a higher power or influence, their community of fellowship with friends, their sources of hope and meaning in life, and their use of religious rituals and practices. Loss can sometimes cause internal conflicts about spiritual values and the meaning of life. Patients who have a strong interconnectedness with a higher power or others are often very resilient and able to face death with relatively minimal discomfort (see Chapter 27). Alternatively, patients faced with a life-threatening or terminal illness may begin to question their faith and wonder why this would be allowed to happen to them.

Coping With Grief and Loss

In order to support patients and families during loss, you must understand how people normally cope with grief and loss. Nursing interventions involve reinforcing the patient's successful coping mechanisms and introducing new coping approaches. Chapter 29 summarizes the nursing care principles for assisting patients in coping with stressful situations.

Hope. Hope is the anticipation of a continued good or of an improvement in, or lessening of, something unpleasant. It is a multidimensional concept that is energizing and provides comfort while a person endures life threats and personal challenges (Smith & Kautz, 2007). Hope enhances coping skills by building on a patient's control. A person often reveals hope through an expression of expectations for life, the present, and the future. Many patients with terminal illness focus hope on milestones or something other than a prognosis (Chochinov, 2006). Spiritual distress is often based on the person's definition of hope or lack of hope. People may view hope as encouragement to work toward recovery. Other people may view hope more negatively by not being able to envision any future favourable outcomes.

Hope has purpose and direction and, in a palliative patient, can contribute to enhancing control, maintaining dignity, and sustaining relationships (Smith & Kautz, 2007). The existence and maintenance of hope depend on a person's having strong relationships and a sense of emotional connectedness to others. Nurses and other health care providers may offer that personal

connectedness essential to hope. Hope is often the basis from which patients find meaning in their illness. Hopefulness enables people to see life as enduring or having sustained meaning or purpose (Chochinov, 2006). Nurses have reported that they believe they make the greatest difference in patients' lives by helping them keep hope alive; by increasing a patient's awareness of what is possible, nurses can, in addition, maintain a renewed sense of purpose through hope (Smith & Kautz, 2007). Chapter 27 discusses the conceptual components of hope and related nursing care implications.

Critical Thinking

When you care for patients who have experienced losses, successful critical thinking requires a synthesis of knowledge, previous experience with loss and grief, and information gathered from patients and families. To provide appropriate and responsive nursing care, you must apply both critical thinking qualities and intellectual and professional standards.

During assessment, you must analyze all sources of information in order to select appropriate nursing diagnoses (Figure 28-1). To understand the process of grief and its effect on the patient and family, you integrate knowledge from nursing and other disciplines and from previous experiences in caring for

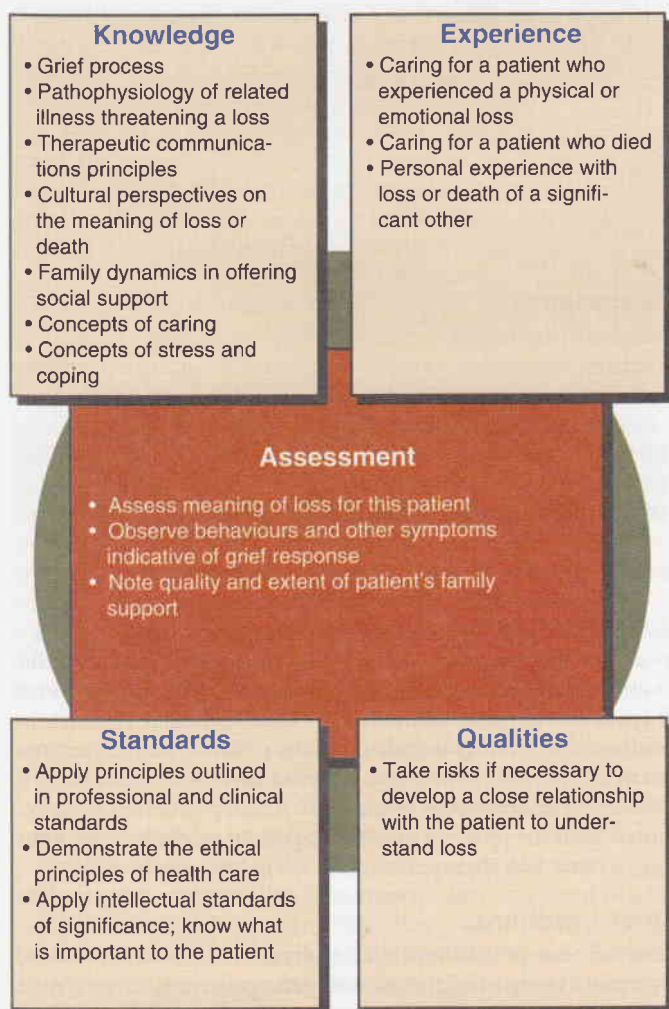


Figure 28-1 Critical thinking model for loss, death, and grieving assessment.

patients suffering loss. Knowledge of the stages of grief, for example, enables you to better empathize with a patient and family and to understand the patient's behaviours. Through identification of the stages of grief, you are able to direct assessment questions. Critical thinking qualities and standards then help you apply this information in a relevant and therapeutic way for the patient's benefit. For example, you need the critical thinking quality of perseverance so that you can learn as much as possible about the type of grief a patient is experiencing, in order to ultimately select the most appropriate nursing interventions. The use of intellectual standards such as significance and relevance helps ensure that the information gathered is pertinent to the patient's unique situation. Guiding standards include those of bioethics, the dying person's bill of rights (Box 28-3), clinical standards such as guidelines for managing cancer pain, the Canadian Nurses Association (CNA; 2008) *Code of Ethics for Registered Nurses*, and provincial regulatory bodies' professional standards and practice standards. All provide evidence-informed guidelines for a thorough assessment and humane, compassionate nursing care.

The Nursing Process and Grief

♦ Assessment

When you care for a patient who has experienced or is facing a loss, assessment includes the patient, family, significant others, and the context. Grief assessment is ongoing throughout the course of an illness for the patient and family and for the bereavement period after the death for the survivors (Verosky, 2006). You should not assume how or whether the patient or family experiences grief. You should also avoid

► BOX 28-3 A Dying Person's Bill of Rights

- I have the right to be in control.
- I have the right to be treated as a living human being until I die.
- I have the right to have a sense of purpose.
- I have the right to be cared for by those who can maintain a sense of hopefulness.
- I have the right to express my feelings and emotions about my approaching death in my own way.
- I have the right to have a respected spirituality.
- I have the right to participate in decisions about my care.
- I have the right to expect continuing medical and nursing attention even though "cure" goals must be changed to "comfort" goals.
- I have the right not to die alone.
- I have the right to be comfortable.
- I have the right to have my questions answered honestly.
- I have the right not to be deceived.
- I have the right to have help from and for my family in accepting my death.
- I have the right to die in peace and dignity.
- I have the right to laugh and to be angry and sad.
- I have the right to retain my individuality and not be judged for my decisions that may be contrary to beliefs of others.
- I have the right to be cared for by caring, sensitive, knowledgeable people who will try to understand my needs and will be able to gain some satisfaction in helping me face my death.

Adapted from Barbus, A. J. (1975). The dying person's bill of rights. *American Journal of Nursing*, 75, 99; and from Hospice RN. (2003). *Patient's bill of rights*. Retrieved from <http://www.geocities.com/HotSprings/5120/bill.htm>.



Figure 28-2 Nurses find a private place to listen to patients express their grief.

assuming that a particular behaviour indicates grief; rather, you should allow patients to share what is happening in their own way. An effective nurse encourages patients to tell their stories. This requires you to establish trust with patients and to evoke a caring presence. It is helpful to have patients and families find a time and place to express their grief and describe their experiences (Figure 28-2). During an assessment, you interview patients and families separately unless a patient requests having family members present. A thorough and comprehensive approach to the assessment of grief will result in a well-designed plan of care that will facilitate patients' and families' abilities to work through grief.

You begin by interviewing the patient and then the family, using honest and open communication. Listening carefully and observing the patient's responses and behaviours are important. You assume a neutral perspective and remain alert for nonverbal cues such as affect, facial expressions, voice tones, and topics that are avoided. While gathering data, you summarize and validate any impressions formed with the patient and family so that appropriate nursing diagnoses can be made. Information from other health care workers, such as physicians, social workers, and providers of pastoral care will contribute to the database.

Type and Stage of Grief

It is important to assess how a patient *is reacting* rather than how the patient *should be reacting*. The sequencing of stages or behaviours of grief may occur in order, they may be skipped, or they may recur. A single behaviour can be representative of any number of types of grief. Therefore, the identification of the type and stage of grief should be used only to guide your assessment and not to judge the outcomes of the grieving process. By understanding a theorist's phase of grief, you can accurately assess a situation. For example, if a patient is complaining of loneliness and difficulty falling asleep, you consider all factors surrounding the loss. When did the loss occur? What type of loss occurred? The patient may be experiencing a normal grief reaction, or, if the loss occurred two years ago, the patient may be experiencing chronic grief.

Ask patients to describe their loss and how it has affected them: "Tell me how your diagnosis of heart disease makes you

► BOX 28-4 Symptoms of Normal Grief

Feelings

- Sadness
- Anger
- Guilt or self-reproach
- Anxiety
- Loneliness
- Fatigue
- Helplessness
- Shock or numbness (lack of feeling)
- Yearning
- Feeling of emancipation or relief

Cognitions (Thought Patterns)

- Disbelief
- Confusion
- Preoccupation about the deceased
- Sense of the presence of the deceased
- Auditory hallucinations
- Perceptual disturbances
- Hopelessness ("I'll never be okay again")

Physical Sensations

- Hollowness in the stomach
- Tightness in the chest
- Tightness in the throat
- Oversensitivity to noise
- Depersonalization ("Nothing seems real")
- Shortness of breath
- Muscle weakness
- Lack of energy
- Dry mouth
- Headache
- Abdominal pain

Behaviours

- Sleep pattern changes
- Appetite disturbances
- Absent-minded behaviour
- Dreams about the deceased
- Sighing
- Emotional lability
- Carrying objects that belonged to the deceased

feel." You can anticipate characteristics or responses during a phase of grieving, but you should allow patients to describe their feelings as thoroughly as possible: "How has this change in your life affected you today?" "Tell me more." Then probe and validate feelings expressed in the patient's emotions: "You seem angry; tell me more" "You seem sad; tell me" "What are your feelings about ... ?" Avoid premature assumptions about the phase of grief that a patient might be experiencing, so that you do not terminate the assessment too early.

Grief Reactions

You will use psychological and physical assessment skills to compile a complete database about the patient, family, or both. Although no two people grieve exactly the same way, most people who grieve have at least some outward signs and symptoms (Box 28-4). Clinical reasoning is needed to analyze the data and cues you have collected and to determine the

appropriate related cause. For example, a patient who is experiencing dysfunctional grieving may have a changing affect, lowered activity level, somatic complaints such as headache or upset stomach, and alterations in sleep patterns, memory, and concentration. You might associate these symptoms with any number of problems such as anxiety, gastrointestinal disturbances, or even impaired memory. However, the focus is to assess the patient's symptoms in context. What are the meaning and significance of the loss, and how are they affecting the patient in physical and psychological ways? With what does the patient associate the symptoms? In what way are the symptoms related to one another when they occur? What symptoms are observed when the patient openly expresses grief? Over what time period have the symptoms been present: before the loss or during the loss? Careful analysis refines your ability to make judgements about the patient's condition.

A loss takes place in a social context. When the primary provider in a family has a terminal illness, the family begins to reorganize itself as soon as the patient is no longer able to fulfill the same number and types of roles. When a person is disabled, the patient and family undergo similar reorganization, realigning roles and responsibilities to meet demands. During this time, patients and families can experience a variety of physical and psychological symptoms. You assess the entire family's response to loss, recognizing that family members may be dealing with aspects of grief different from those of the patient. Good interviewing and physical assessment skills guide you as caregiver and as an advocate of the patient in planning appropriate nursing care. It is important to assess for any changes in family relationships or interactions during a patient's illness. Terminal illness may bring distant family members together, which can result in additional stressors on families. An awareness of this potential allows you to identify strategies for adaptive family coping if they are required.

Factors That Affect Grief

Because a number of factors influence loss and the grief response, it helps to discuss the meaning of loss to the patient and family. This discussion usually elicits information that allows you to explore a number of topics in detail, such as personal characteristics of the person experiencing loss, the nature of family relationships, support systems, and cultural and spiritual beliefs (Table 28-3). You must then apply assessment skills from appropriate specialty areas (e.g., family or spiritual assessment; see Chapters 19 and 27, respectively) to acquire a thorough understanding of the patient's loss.

End-of-Life Decisions

Serious illness or loss can add a stressful and difficult element to decision making. Time to make decisions or consider all options may be limited, or the patient may be unable to fully participate in the decision-making process (Payne, 2009). In order to preserve patient autonomy, many people are using advance directives. Advance directives may include living wills or the designation of a health care proxy. Although living wills or other advance directives may not be recognized legally in all provinces, the CNA (1994), along with other national health organizations, developed the *Joint Statement on Advance Directives*. In this document, the CNA stated that "all persons have the right to make decisions regarding their health care and treatment, including the right to request or refuse life-sustaining treatment" (p. 1). An advance directive documents a person's preferences regarding life-sustaining treatment and

communicates these preferences if the person becomes incapable of doing so for himself or herself (CNA, 1998). This upholds the nursing professional value of autonomy. There are some disadvantages to advance directives. A living will limits treatment; however, instructions in a living will may not adequately cover the uniqueness of each potential situation (Payne, 2009). A **health care proxy** is designated in advance by the patient, knows the patient's wishes regarding treatment and life-sustaining procedures, and ideally would live locally (Sabatino, 2010). As a nurse, you must be aware of the legal status of advance directives in your province or territory and the laws regarding a person's competence to consent to treatment, as well as legislation regarding the selection and responsibilities of substitute decision makers or a health care proxy (see Chapter 8).

When a person has a terminal illness, family members must face end-of-life decisions that have ethical, legal, and practical implications. Families may experience higher levels of stress, discomfort, or even guilt when deciding whether to initiate or withdraw life-sustaining treatments. Some treatments may offer symptom relief but simultaneously prolong life, which creates conflict or dilemmas for families and caregivers. Although some patients may have advance directives, it is important for family members to know in advance a patient's wishes in regard to life-sustaining measures. At times, family members may disagree with each other about treatment plans, or the values of the family may be in conflict with those of the health care provider. Situations such as these often result in ethical dilemmas for families, nurses, or other care providers. Decision making related to ethical situations should consider the primary nursing values from the CNA (2008) *Code of Ethics for Registered Nurses*. Ethicists and ethical decision-making models may be used if agreement on treatment is not possible.

The *Code of Ethics for Registered Nurses* (CNA, 2008) identifies three values that are pertinent to nurses assisting individuals in end-of-life decision making:

1. Promoting health and well-being: Nurses must ensure that an individual's wishes as stated in an advance directive are respected and that continuing care and support are provided.
2. Promoting and respecting informed decision making: Nurses must respect and promote the autonomy of individuals, help patients express their needs and values, and help patients obtain appropriate care.
3. Preserving dignity: Nurses must advocate on the patient's behalf and examine biological, psychological, social, cultural, and spiritual factors that affect end-of-life treatment decisions.

Responsibility statements associated with each value in the code give more direction to nurses in upholding the values. For example, the value "health and well-being" includes this responsibility statement: "When a person receiving care is terminally ill or dying, nurses foster comfort, alleviate suffering, advocate for adequate relief of discomfort and pain and support a dignified and peaceful death" (CNA, 2008, p. 14).

The National Consensus Project (NCP, 2009) has articulated a set of major domains and clinical practice guidelines regarding end-of-life care. You must assess the patient's and family's wishes for end-of-life care, including the preferred place for death, the use and extent of life-sustaining measures, cultural-specific expectations, and expectations regarding pain control and symptom management (Box 28-5). Does the patient want to try all available treatments? Does the family or patient insist

► **TABLE 28-3** Assessment of Factors That Influence Grieving

Factor	Areas, Suggestions, and Questions to Explore
Nature of relationships	Functions of the family, community, and society <i>Examples:</i> "How long have you known your friend?" "What role has your mother played in your family?" "What is your relationship? Will it change?" "How will family relationships change as a result of the loss?"
Social support system	Availability of family, friends, health care providers <i>Examples:</i> Who is present? Absent? Supportive? Nonsupportive? What do family and friends do that is most meaningful? Are family and friends available when needed? Are health care providers accepting and exploring ways to preserve the patient's dignity and lifestyle?
Nature of loss	Actual versus perceived; death issues; impact on roles <i>Examples:</i> "Tell me what the loss means to you." "What factors help you to grieve?" "What factors interfere with grieving?" "What past experiences or outcomes have you had with loss?"
Cultural and spiritual beliefs	Values, cultural norms, spirituality, customs, attitudes <i>Examples:</i> "What is your belief about death? About the meaning of life?" "What customs do you value at the time of death?" "How is this loss viewed by other people of your culture or religious group?" "Do medical treatments interfere with religious practices?" "Who has the right to say yes or no to life-sustaining measures?"
Loss of personal life goals	Actual or perceived individual losses affecting future decisions and options <i>Examples:</i> "What is your goal in life for ... ?" "How has this goal changed as a result of your diagnosis?" "How will your role change your personal goals?" "What planning have you and your family made for your own life?"
Family's grief	Relationships, involvement with the dying process <i>Examples:</i> Observe patient and family's level of grief, patterns of behaviour, rank of leadership or power. What has helped family members deal with problems in the past? What was not helpful? What are the family's strengths and weaknesses?
Survivor risk factors	High risk, such as sudden death, violent death, loss of a child <i>Examples:</i> "Describe your feelings at this time." "Let's talk about why you think you could have prevented this. Are you feeling guilty because ... ?" "What are unresolved issues or perceptions toward others?"
Hope	Goals, worth, adaptation to future changes <i>Examples:</i> "Tell me what you think about your treatment plan." "What do you expect will happen to you?" "How does this illness affect your goals in life?" "What are you hoping for after your surgery?"

on the use of a feeding tube for continued nutritional support after the patient stops eating? When life support requires use of a mechanical ventilator, is this something the patient wants? Does the family feel comfortable in administering analgesics? You must give the patient and family time to discuss their preferences. Often it is necessary to return to a conversation on a subsequent day or visit. If you feel uncomfortable in assessing a patient's wishes, it is important to find a health care provider who is experienced with discussing end-of-life issues and can assist in communicating a patient's preferences to the

health care team. For example, physicians may be helpful when discussing issues related to probability or futility, or a social worker may be able to help with decision making with regard to family roles, responsibilities, and relationships.

End-of-life care is one of the more significant topics you will discuss with patients (Box 28-6). Good interdisciplinary teamwork is essential to provide quality end-of-life care. Thus, you must communicate what is known about patient preferences and decisions in change-of-shift reports, health team conferences, written care plans, documentation in the patient's

* BOX 28-5 RESEARCH HIGHLIGHT

Family Perception of End-of-Life Care

Research Focus

Family members are often involved in providing care during a dying person's last month of life, regardless of the setting (home, hospice, or hospital). Their perspectives of how the person's last days of life are spent provide valuable insight into the quality of end-of-life care.



Research Abstract

Radwany et al. (2009) conducted a retrospective study of bereaved family members. The research obtained information from 23 family members following the death of a loved one from a terminal illness. Data about the emotional burden and experiences of families regarding end-of-life decision making, the illness experience, and the dying process were collected. Findings suggested that residual emotional burden may linger. Aggressive life-sustaining treatments were not used extensively, and decisions to forgo or discontinue aggressive treatments were very difficult for families. Families prefer to fully understand the condition of the patient with a very clear awareness of the severity and course of the illness. Families stated they felt they needed more information in advance to prepare them for the dying process, so they would know what to expect.

Evidence-Informed Practice

- It is important to learn directly from patients and families their understanding of the illness.
- Families of dying patients may have great difficulty making decisions about the cessation of some curative treatments.
- You should recognize that family members carry a significant emotional burden, particularly with respect to decision making, and will need your support.
- You should provide guidance and support to help families understand the dying process. Families need to know in advance what they may expect to see throughout the dying process.

Reference: Radwany, S., et al. (2009). End of life decision making and emotional burden: Placing family meetings in context. *American Journal of Hospice and Palliative Medicine*, 26(5), 376–383.

record, and ongoing consultation with physicians and other health team members.

Nurses' Experience With Grief

When caring for grieving patients, you must assess your own emotional well-being. Self-reflection, which is a part of critical thinking, is a valuable tool in assessing whether a person's sadness is related to the patient, to unresolved personal experiences from the past, or to a combination of both. It is normal to have personal feelings and emotions about certain illnesses and death. However, it is inappropriate to emphasize your personal family situations and values over those of the patient. Talking with friends and professional colleagues may help you to resolve conflicts about caring for dying patients. Some nurses choose to work in a specialty area in which deaths are usual. Close bonds between nurses and patients often develop in these situations. Part of being a professional involves knowing yourself and when to move away from a situation. Nurses who choose to work in palliative care settings obtain support from their peers, as well as from interdisciplinary team debriefings. Nurses may not always identify maladaptive

BOX 28-6 NURSING STORY

Nursing Roles With Loss, Grief, and End-of-Life Issues: John's Story

Nurses from many areas and disciplines are involved in the experiences of loss, death, and grief. John is an 81-year-old with recurrent small-cell lung cancer and is considered eligible for palliative care. Several years ago, he received a diagnosis of limited-stage small-cell lung cancer. A course of chemotherapy and radiotherapy resulted in a remission of several years' duration. Subsequent follow-up revealed that the cancer had returned, and John's condition was considered terminal. Throughout John's experience with his illness, he has interacted with many nurses with varying roles and responsibilities. Although these nurses all had different roles, functions, and work areas, they were all involved and sharing with John and his family's sense of loss, grief, celebrations, and eventual preparation for death.

Initially, John interacted with the clinic nurse at his family physician's office. Although not involved directly in his care, this nurse was able to provide support, reassurance, and encouragement each time John visited the office. While John was receiving his treatments at the cancer centre, he relied on the chemotherapy clinic nurses to check how he was feeling, and he counted on them to be caring but not gloomy, to keep his spirits up, and to encourage him to keep "fighting" while it was beneficial. One nurse in particular had frequent contact with John, and he looked forward to seeing her. She was a clinical trials research nurse, and John had enrolled in a medication trial. This advanced practice nurse was, to John, like his own private nurse, someone who wanted to see him regularly, took a genuine interest in him, and provided tremendous support to him and his family.

Home care nurses also played an important role in John's experience. The initial home assessment, enrolment in a community palliative care program, and discussion of "do not resuscitate" protocols were managed in a caring and compassionate manner. John's health is now relatively stable and appears to have reached a plateau in the disease course. Each time the home care nurse visits and performs her assessment and documentation, John sees this as a "social" visit but finds the support to be very important. Being a reserved person, John finds it easier to discuss some of his issues with a professional. John has not decided yet whether he wishes to die at home or in a hospital; however, caring and compassionate palliative care nurses will at that point become key components of John's and his family's experience.

John's story is not unique, and most nurses are involved in the experience of loss, death, and grief, regardless of the area of practice. Having a sound understanding of these concepts will enable you to provide supportive, understanding, and compassionate care to your patients, anywhere along the continuum of life, loss, grief, and eventually death.

coping behaviours themselves, and the entire team has a responsibility to recognize and support ineffective coping in their colleagues (Rollings, 2008).

Patient Expectations

You must assess the patient's and family's expectations for nursing care. Patient perceptions and expectations can influence how you prioritize nursing diagnoses. For example, if patients perceive their pain and discomfort as severe, they will be less attentive to attempts to discuss the significance and meaning of their loss. Before you can begin meaningful

discussion or counselling, the patient must be comfortable. On occasion, patients are hesitant to accept, and families reluctant to administer, narcotic analgesics because of fears of addiction.

Significant medication teaching may be required in these situations. Once the patient is assessed as comfortable and the patient considers the pain level acceptable or under control, you should assess the patient's expectations within the context of the loss by asking questions such as "How can we help you cope with your loss?" "What do you feel is necessary from us for you to be able to manage the grief you feel?" "What is most important that we do for you while you are under our care?"

It is important to give family members the chance to explain how they perceive your role, explain what they think are the goals of the health care team, and ask any questions they may have. This helps you clarify any misunderstandings that might exist. For example, the family may have unrealistic expectations regarding the treatment available to the patient and the anticipated effects, or different family members may have conflicting opinions.

❖ Nursing Diagnosis

From data collected during assessment, you identify a nursing diagnosis that accurately reflects the needs of the patient or family experiencing the loss. Critical thinking skills are the tools used to apply concepts of assessment, clustering of cues, and drawing a conclusion of the actual or perceived needs of the patient. You cluster defining characteristics and identify the nursing diagnosis applicable to the patient's situation (Box 28-7). Clustering of patient or family behaviours, actual or potential losses, the patient's attempts at coping, and data involving the nature and meaning of the loss will lead to individualized nursing diagnoses, such as the following:

- *Anticipatory grieving*
- *Anxiety*
- *Caregiver role strain*
- *Compromised family coping*
- *Dysfunctional grieving*
- *Fear*
- *Hopelessness*
- *Ineffective coping*
- *Ineffective denial*
- *Powerlessness*
- *Readiness for enhanced spiritual well-being*
- *Social isolation*
- *Spiritual distress*

The presence of one or two defining characteristics is usually insufficient for an accurate diagnosis. You must carefully review the data to consider whether competing diagnoses exist. For example, if a dying person cries, displays anger, and reports nightmares, this could signal several possible nursing diagnoses, as these characteristics are common to more than one diagnosis. Possibilities include *pain*, *ineffective coping*, and *spiritual distress*. You examine all available data and inquire about and observe for the presence of other behaviours and symptoms until you can identify an accurate diagnosis.

Part of the diagnostic process is to identify the appropriate related factor for each diagnosis. For example, *dysfunctional grieving related to the loss of the ability to walk from paralysis* necessitates different interventions than does *dysfunctional grieving related to the loss of a job*.

In order to promote a holistic approach to care, wellness-oriented diagnoses need to be included, such as *readiness for*

► BOX 28-7 NURSING DIAGNOSTIC PROCESS

Assessment Activities	Defining Characteristics	Nursing Diagnosis
Ask patient to discuss future goals and plans.	Patient sighs and says, "I have no future."	<i>Hopelessness related to failing physical condition</i>
Observe patient's nonverbal behaviour.	Patient becomes passive with little affect and turns away from speaker.	<i>Ineffective individual coping related to low mood, and inability to manage loss</i>
Offer patient choices and observe responses.	Patient shrugs and says, "What does it matter?"	<i>Powerlessness related to perceived poor outcomes</i>
Assess activity level.	Patient refuses to eat. Patient sleeps all the time, keeping blinds closed and lights out. Patient refuses to participate in care.	<i>Self-care deficit related to inability to perform activities of daily living</i> <i>Social isolation related to inability to cope with loss</i>

enhanced spiritual well-being. These diagnoses allow for recognizing and drawing from patient strengths. In addition, the nursing diagnostic process is continual because the patient situation will change.

When identifying nursing diagnoses for the dying patient, other problems are identified separately according to specific standards of care. Other nursing diagnoses can include *disturbed body image*, *impaired physical mobility*, or *ineffective role performance*. More physical nursing diagnoses are identified when the patient begins to experience physical changes accompanying the progression of illness, including *impaired urinary elimination and/or bowel incontinence*, *acute pain*, *nausea*, *disturbed sensory perception*, and *ineffective breathing pattern*. The comfort of dying patients, including specialized pain control and acceptance of the dying process by the family, is a realistic expectation. With terminal illness, physical assessment of the dying process is ongoing so that you can adapt or validate the actual nursing diagnoses with the patient's changing condition.

❖ Planning

Grieving is the natural response to loss and thus has a therapeutic value. The focus in planning nursing care is to support the patient physically, emotionally, developmentally, and spiritually in the expression of grief. Figure 28-3 illustrates the interrelatedness of critical thinking factors during the planning phase of the nursing process. Through critical thinking, you ensure a well-designed plan in which you support the patient's personhood, self-esteem, and autonomy by including the patient in making decisions about the plan of care. When caring for the dying patient, it is important to devise a plan that helps a patient die with dignity and offers family members the assurance that their loved one is cared for compassionately

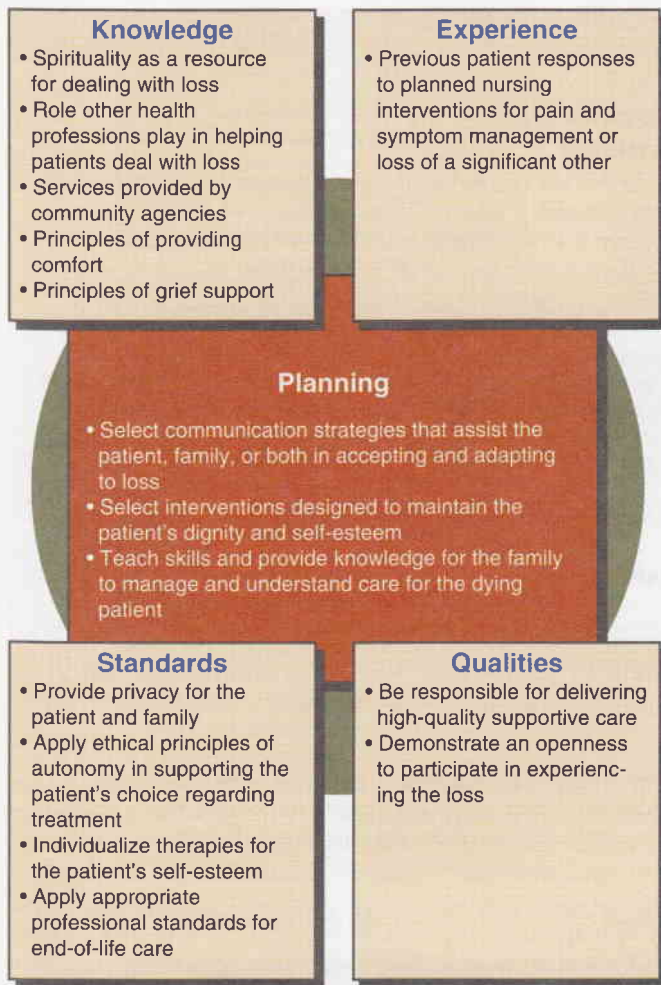


Figure 28-3 Critical thinking model for loss, death, and grief planning.

(Box 28-8). The care planning process is highly individual to the patient and family, and when possible, both must be included as active participants in your planning, goal setting, and development of realistic interventions and timelines.

Goals and Outcomes

You establish realistic goals and expected outcomes on the basis of a patient's nursing diagnoses. Patient resources such as physical energy and activity tolerance, supportive family members, spiritual faith, and methods for coping are integrated into the plan of care. For example, if a patient with a life-threatening illness has the diagnosis *powerlessness related to planned cancer therapy*, a goal of "Patient will be able to discuss expected course of disease" is realistic if the patient is able to remain attentive and participate in educational discussions without becoming fatigued. In contrast, the expected outcome "Patient will participate in series of short planned teaching discussions about disease" accounts for the patient's need for teaching sessions to be short to avoid exhaustion.

Goals of care for a patient dealing with loss might be long or short term, depending on the nature of the loss, the patient's phase of grieving, and the nature of the illness. Many terminally ill patients experience plateaus (periods of relatively stable health) interspersed with periods of exacerbation of symptoms. Because a patient may move back and forth between phases of grief, you may need to revise goals and outcomes to ensure that they remain relevant. Help from the patient's partner in deciding which goals are relevant is important. General nursing care goals for patients with a loss include accommodating grief, accepting the reality of a loss, and renewing regular relationships. When a patient has a terminal illness, controlling pain and symptoms, maintaining autonomy, and achieving spiritual comfort are important goals. For the goal "achieving a sense of dignity," expected outcomes might include the following:

BOX 28-8 NURSING CARE PLAN

Ineffective Coping

Assessment

Jan Runyon is the nurse who admits Mr. Miller, a 48-year-old man, from the emergency department to the intensive care unit (ICU) after traumatic brain injury incurred in a motor vehicle accident. Mr. Miller is a successful business executive who has a wife and two sons. The physician has explained to the family that Mr. Miller's prognosis is poor. Tests are underway to determine the extent of brain injury. Mrs. Miller and the children are in the ICU waiting area, waiting on word about Mr. Miller.

Assessment Activities

Jan asks Mrs. Miller, "Tell me how you are feeling about your discussion with the physician."

Jan observes Mrs. Miller's interaction with her children.

Jan overhears Mrs. Miller on the phone in the waiting area.

Jan accompanies the transplant coordinator, who asks Mrs. Miller if the family has ever discussed organ donation.

Findings and Defining Characteristics

"I know they are doing everything they can. He is going to be okay, I just know he is. He has never been sick a day in his life."

Mrs. Miller has difficulty problem solving. The family has posed several questions to her as to what she plans to say to Mr. Miller's employees. Mrs. Miller is unable to decide what to say at this time.

Mrs. Miller states over the phone, "Don't worry, he's having some tests right now. I know Bill: he'll be back in the office before you know it. Tell the staff everything will be okay."

Mrs. Miller responds, "Bill will be fine. That's not important right now!"

Nursing Diagnosis: Ineffective coping related to husband's traumatic brain injury and poor prognosis

Continued

► BOX 28-8 NURSING CARE PLAN—cont'd

Planning**Goal (Nursing Outcomes Classification)***

Wife will accept the fact that the patient will probably die within 48 hours.

Wife will demonstrate effective expression of grief within next 48 hours.

Expected Outcomes**Grief Resolution**

Wife will verbalize to caregiver within the next 6 hours that husband's death is actually imminent.

Wife will inform children within 24 hours of their father's likely death.

Wife will make a decision about organ donation within the next 12 hours.

Wife will discuss immediate lifestyle changes that will occur as a result of husband's death over next 48 hours.

Wife will discuss with children their concerns about what they need to do as a family to prepare for father's impending death within next 48 hours.

Wife will discuss effects loss has on her personally with caregiver within next 48 hours.

*Outcomes classification label from Moorhead, S., Johnson, M., & Maas, M. L. (2008). *Nursing outcomes classification (NOC)* (4th ed.). St Louis, MO: Mosby.

Interventions (Nursing Interventions Classification)[†]**Presence**

Display interest in wife's situation and accept her behaviours of denial.

Establish trust and a positive regard by creating an atmosphere of sharing. Offer privacy and security.

Grief Work Facilitation

Offer wife encouragement to explore and verbalize feelings of grief.

Identify personal coping strategies used in the past; assess their effectiveness, and promote them when appropriate.

Determine wife's acceptance of available community resources and initiate as appropriate: significant other (business partner), children, clergy, or other health care providers.

Rationale

Recognizing denial (based on Kübler-Ross's [1969] theory) gives the staff direction for planning unique interventions based on grief theory (Verosky, 2006).

Privacy offers a place of security to exhibit personal needs and to work through feelings (Chochinov, 2006). Anxiety about losing dignity when expressing grief will hinder an honest expression of feelings.

Encouragement refocuses on current needs and assists in initiating grief process.

Previously successful coping strategies are the first to be used when a person is under stress (Grassi, 2007). Discouraging maladaptive behaviours helps minimize dysfunctional grieving.

Professionals can use their expertise to direct the grieving process (Verosky, 2006). Trust in relationships already formed will speed the therapeutic communication process.

[†]Intervention classification labels from Dochterman, J. M., Bulechek, G. M., & Butcher, H.K. (2008). *Nursing interventions classification (NIC)* (5th ed.). St Louis, MO: Mosby.

Evaluation**Nursing Actions**

Say to patient's wife, "This has been a difficult time. Your husband's injury has been so sudden."

Ask, "Tell me how you are feeling now."

Observe wife's behaviour when with children. Wife discusses decisions that must be made.

Patient Response and Finding

Wife responds, "I still cannot believe it. The doctors do not believe he will live through the night."

Wife explains, "I am worried about my kids. Both boys are close to their dad. I feel this unbelievable sadness."

Wife discusses decisions that must be made because of impending death of husband. She allows the children to express their sadness.

Achievement of Outcome

Wife begins to acknowledge patient's impending death.

Wife is able to express normal grieving behaviours.

Wife is able to express grief with family; maintains role as supportive mother.

- Patient will be able to continue parental responsibilities in care of toddler.
- Patient will express hopefulness that cancer treatment will control symptoms.
- Patient will engage in playing chess with friends on a weekly basis.

Setting Priorities

When a patient has multiple nursing diagnoses, the problems cannot be addressed simultaneously. At any given time, two or three problems dominate your attention. Figure 28-4 is a concept map developed for a patient with a medical diagnosis of depression after the death of his wife six months previously.

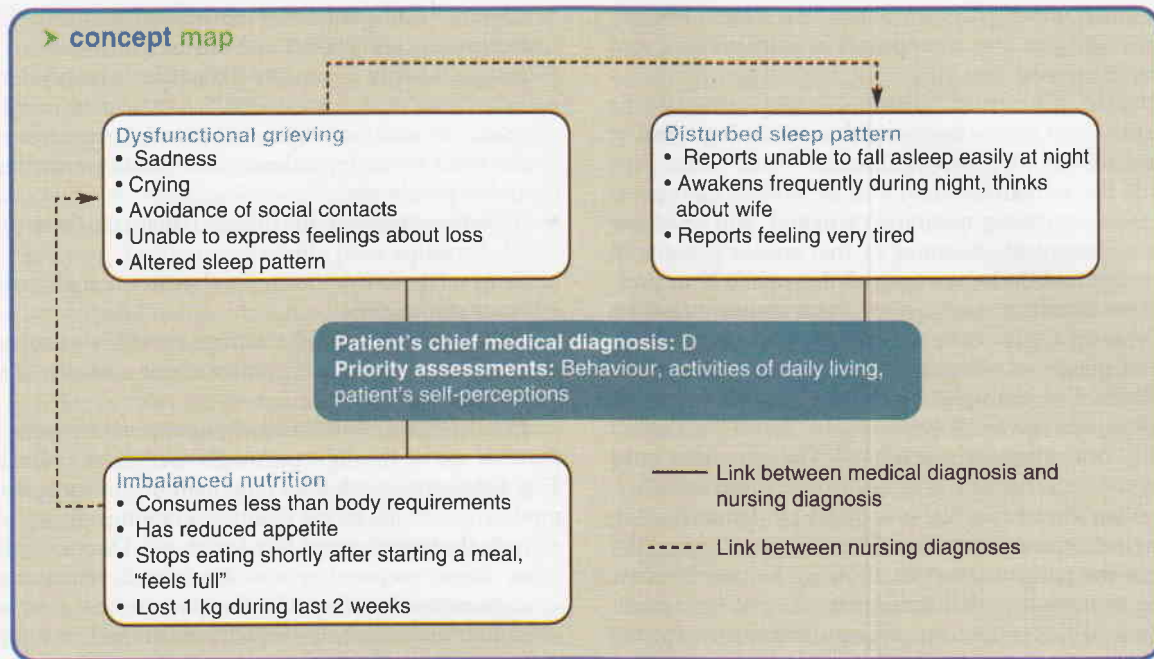


Figure 28-4 Concept map for a patient with depression after the death of his wife.

As a result of the patient's medical condition, associated health problems include the nursing diagnoses *dysfunctional grieving*, *disturbed sleep pattern*, and *imbalanced nutrition: less than body requirements*. You must determine which of the three diagnoses necessitates greater attention. The continuing grief experienced by the patient might be the focus. Until the patient is able to accept his loss and begin resolving his grief, he may be unable to attend to interventions that will improve his nutritional intake and sleep status.

Patients' conditions always change. In the ongoing assessment of a patient's condition, you can quickly discover a new problem. You must always consider which of the patient's most urgent physical or psychological needs require immediate intervention. You consider the patient's expectations and preferences in regard to the priorities of care. If a terminally ill patient's priorities include controlling pain and maintaining self-esteem, pain control is the priority when analgesics become ineffective and the patient experiences acute distress. If the patient is progressing as desired, you may refocus priorities to address unmet needs. For example, the patient suffering depression caused by his wife's death also has problems of imbalanced nutrition and disturbed sleep pattern. If the patient reports improved appetite and has shown weight stabilization since the last clinic visit, you can focus more attention on the sleep pattern disturbance. You must remember that the patient's expectations, clinical condition, and preferences influence priorities. If a terminally ill patient places more emphasis on spiritual support than on other priorities such as learning about planned treatments, you must attend to the patient's priorities. Meeting patient priorities may allow you to then address other needs more effectively with less effort.

Continuity of Care

Interdisciplinary teams help identify and meet the needs of people who experience losses. Dietitians, clergy, physicians, social workers, physiotherapists, psychologists, chaplains, and other specialty health care providers can assist a patient and

family in their grief. A coordinated team approach to managing a patient's needs results in a well-managed care plan. When a patient dies, the loss that you and your colleagues experience can be shared within the interprofessional group. Support is needed to promote healing for all who worked with the dying patient and the family. Conflicts and differences can be discussed openly and solutions found in a healthy manner with the patient as the primary focus. For example, ethical conflicts may have arisen related to proposed or performed medical treatments or interventions. Through working together, the sharing of experiences, feelings, alternatives, and solutions becomes the basis for dealing with future losses.

Many terminally ill patients return home and require continued intensive nursing care. Home care nurses collaborate closely with family members to meet the patient's ongoing needs. Important interventions to include in planning a return home are arranging for main-floor access, arranging appropriate medical equipment, and providing sufficient family respite. When it is realistic for the patient to remain independent, therapeutic strategies should bolster the patient's sense of autonomy and the ability to function as independently as possible (Smith & Kautz, 2007). For example, judicious application of orthotic devices, along with physiotherapy and occupational therapy, can often bolster a patient's functional capacity. In the home, safety issues related to the environment may exist, and patients often benefit from nurse-initiated referrals to community occupational therapists.

Implementation

Health Promotion

Although a return to full function is not an expected outcome for a terminally ill patient or even for a patient who has significant disability, optimal physical and emotional functioning is a realistic goal. The goal of nursing care is to help patients and families cope with the stressors in their lives and to achieve healthy grief resolution. You help patients and families in

dealing with loss, making decisions about the patient's health care, and adjusting to any disappointment, frustration, and anxiety created by their loss.

Therapeutic Communication. Nursing care of the grieving patient and family begins with establishing a caring presence and determining the significance of their loss. This is difficult if the patient is unwilling or unable to express feelings or is experiencing numbing or denial. You must use therapeutic communication strategies that enable patients to discuss their loss and find ways to work through it. Your presence, attentive listening, and use of open-ended questions enable patients to freely share their thoughts and concerns. Closed-ended questions often reflect only what you presume is the problem. For example, in response to the question "Does knowing you have cancer make you fearful?" a patient will probably not reveal as much as to "Tell me how your diagnosis of cancer is making you feel." You should acknowledge the patient's grief and show support by demonstrating caring behaviours throughout the discussion (see Chapter 18). You will gain the patient's trust by showing a desire to enter into a caring, therapeutic relationship with the patient. Listening attentively to the patient can be very therapeutic for the patient, and you may discover details that help you plan effective care.

If a patient chooses not to share feelings or concerns, you should convey a willingness to be available when needed. If you are reassuring and respectful of the patient's need for dignity and privacy, a therapeutic relationship will probably develop. Sometimes patients need to begin resolving their grief before they can discuss their loss.

Some patients will not discuss feelings about their loss, or sometimes a patient does not want to discuss loss, symptoms, or impending death. You must observe for expressions of anger, denial, depression, or guilt. You must also know your own feelings before encouraging patients to express their anger. Individuals may express anger toward family, staff, or physicians. Patients can also become demanding and accusing. You must remain supportive by letting patients and family members know that feelings such as anger are normal. For example, you might say, "You are obviously upset. I just want you to know I am here to talk with you if you want." You must avoid barriers to communication such as denying the patient's grief, providing false reassurance, or avoiding discussion of sensitive issues (see Chapter 17).

No topic that a dying patient wishes to discuss should be avoided. When the patient wants to talk, it is important for you to find time to do so. This can be challenging for a nurse with limited experience with dying patients or who works in a busy acute care setting. You should respond to questions openly and honestly and provide information that helps patients and their families to understand their condition, the trajectory or future course of their disease, the benefits and burdens of treatment, and values and goals (Verosky, 2006). In some cases, you may recognize the need for pastoral care or counselling services, and you can initiate a referral for the patient to consult with such professionals.

Promoting Hope. Hope can be an energizing resource for patients experiencing loss. For each dimension of hope, nursing strategies that promote hope exist.

- *Affective dimension:* Show empathic understanding of the patient's strengths. Reinforce expressions of courage, positive thinking, and realistic goal setting. Encourage expression of both positive and negative feelings.

- *Cognitive dimension:* Offer information about the illness and treatments, and correct any misunderstanding or misinformation. Clarify or modify the patient's perceptions.
- *Behavioural dimension:* Assist the patient in using personal resources and making use of external supports to balance the need for independence with healthy interdependence and dependence.
- *Affiliative dimension:* Encourage patients to foster supportive relationships with others.
- *Temporal dimension:* Focus on short-term goals as life expectancy diminishes.
- *Contextual dimension:* Encourage development of achievable goals. Allow time to reminisce about achievements or positive moments.

Facilitating Mourning. Nursing care strategies can help patients move through uncomplicated grief (Worden, 2009). The following guidelines are helpful for people who are mourning a death, facing death, or grieving over an actual loss:

- *Help the patient accept that loss is real.* Discuss how the loss or illness occurred or was discovered, when, under what circumstances, who told the patient about it, and other similar topics to help make the event real and to place it in perspective.
- *Support efforts to live without the deceased person or in the presence of disability.* A problem-solving approach is often helpful. Have patients or the family make a list of their problems, help them prioritize the problems, and then lead them step by step through a discussion of how they might tackle each one. Encourage them to rely on other family members, community resources, or other people who can help.
- *Encourage establishment of new relationships.* Many people fear that establishing new relationships would be disloyal. They need reassurance that new relationships do not mean that they are replacing the person who has died. Encourage the patient to become involved in nonthreatening social relationships (e.g., religious gatherings, volunteer activities).
- *Allow time to grieve.* It is common to have "anniversary reactions" around the time of the loss in subsequent years. Some people worry that they are mentally or emotionally unstable when sadness or other signs of grief recur after a period of relative calm. Encourage the patient to reminisce.
- *Interpret "normal" behaviour.* Being distractible, having difficulty sleeping or eating, thinking one has heard the deceased's voice, or dreaming about the deceased are common after loss. These symptoms do not mean an individual has an emotional problem or is becoming ill in some way. Reinforce the fact that these occurrences are normal and will resolve over time.
- *Provide continuing support.* Patients and their families may need to talk and may look to you for support for many months or years after a loss. If you have occasion to see the patient or family after an extended time, it is appropriate to ask about how they are coping or adjusting. This gives them the opportunity to talk if they need to.
- *Be alert for signs of ineffective coping.* Be aware of coping mechanisms that may be maladaptive, such as increased alcohol or substance abuse, which can include excessive use of over-the-counter pain medications or sleep aids.

Acute Care

Palliative Care. For people who face life-threatening illnesses, medical and technological advances are available to

reverse the course of the disease or prolong life. For patients with serious life-limiting illness, it becomes important for health care providers to find ways to help patients approach the end of life. The aim of **palliative care** is to relieve suffering and improve the quality of living and dying (Chochinov, 2006). Not all patients and families who would benefit from palliative care services will receive them. Some patients and families will “leave no stone unturned” and therefore will not accept that the patient is dying. In situations where patients become suddenly ill or symptoms do not appear until late stage terminal illness, the patient and family have not had time to grieve the loss and subsequently accept the impending death. In other cases, palliative care resources may be limited, may not be available in a timely manner, or may not be available at all.

Palliative care is for any age, any diagnosis, and at any time, not just during the last few months of life. Chochinov (2006) explained that when preservation of dignity becomes the goal of palliation, care options encompass the physical, psychological, social, spiritual, and existential aspects of the patient's illness. Palliative care thus allows patients to make more informed choices, better alleviate symptoms, and have more opportunity to manage unfinished business. Ferris et al. (2002) designed the *Model to Guide Patient and Family Care*, which provides a comprehensive approach for palliative caregiving with nationally accepted principles and norms of practice.

According to the World Health Organization (2008), when health care providers supply palliative care, they do the following:

- Provide relief from pain and other distressing symptoms
- Affirm life and regard dying as a normal process
- Neither hasten nor postpone death
- Integrate psychological and spiritual aspects of patient care
- Offer a support system to help patients live as actively as possible until death.
- Offer a support system to help families cope during the patient's illness and their own bereavement
- Enhance the quality of life

Chochinov (2006) added that palliative care also helps patients and families “combine the best of modern medicine and symptom management techniques [and] provides an opportunity to achieve dignity-conserving end of life care” (p. 84) and “encompasses the psychosocial, existential and spiritual aspects of the patient's experience” (p. 84).

Palliative care is a philosophy of total care. A palliative care approach ensures that a patient experiences a “meaningful death,” free of avoidable pain and suffering, in accordance with the patient's and family's wishes, and “is the difference between technically competent symptom management [and] a holistic approach to end of life care” (Chochinov, 2006, p. 84). Palliative care is highly dependent on an interdisciplinary team-based approach, in which each team member has individual expertise and makes an individual commitment to common goals. The team includes physicians, nurses, social workers, pastoral care providers, physiotherapists, occupational therapists, and pharmacists. Massage therapists, music therapists, or art therapists—who provide alternative therapies—might also be a part of the team (see Chapter 34). Volunteers are also part of the team and can provide additional psychosocial support and simple comfort measures.

The Canadian Hospice Palliative Care Association Nursing Standards Committee (2005) has developed nursing standards of practice for hospice palliative care. These nursing norms strive to ensure that knowledgeable and skilled caregivers are

available and are supported. Goals of the guidelines include revealing any gaps in the care of a patient and giving guidance to management of the health care resources consistent with the palliative care philosophy.

Palliative care is compassionate and supportive of dying people and their families. Nurses play a key role in providing care to the dying because of the intimate nature of the nurses' work, and the fact that they are present with the patient and families, often for 8 or 12 hours at a time, depending on the context. Thus, one of the most important skills you provide in palliative care is establishing a caring relationship with both patient and family. It also becomes very important for you to provide appropriate symptom-control measures for maintaining the patient's dignity and self-esteem, to prevent feelings of abandonment or isolation, and to provide a comfortable and peaceful environment at the time of death.

Symptom Control. Comfort for a dying patient requires management of symptoms of disease and therapies. For many patients, symptom distress is characteristic of the dying experience (Chochinov, 2006). *Symptom distress* is the experience of discomfort or anguish related to the progression of a disease. Patients experience anguish from not knowing or being unaware of aspects of their health status or treatment. Worry and fear are common among patients and may heighten their perception of discomfort. You assess the character of the patient's symptoms carefully in order to select appropriate therapies. Chapter 41 details the assessment of pain. By providing information about treatment options or the anticipated course of an illness, you help preserve the dignity of patients and families (Radwany et al., 2009). Complementary therapies are sometimes used for symptom management: for example, therapeutic touch, massage, aromatherapy, music therapy, bio-feedback, homeopathy, acupuncture, and relaxation therapy. On occasion, patients may inquire about culture-specific complementary therapies. In some jurisdictions, up to 86% of hospice programs are offering complementary therapies, with the most popular being massage, music therapy, energy healing, guided imagery, and aromatherapy (Horowitz, 2009). Chapter 34 discusses complementary therapies in more depth.

One symptom common among terminally ill patients is dyspnea (air hunger). The sense of suffocation can cause anxiety or panic in the patient and significant stress in the caregiver (Kouch, 2006). As the patient's anxiety increases when he or she is unable to breathe adequately, the dyspnea worsens. Family who are in attendance may likely become more anxious. Radwany et al. (2009) interviewed family members of terminally ill patients and found that collaborative decision making, including the patient's views, helps the patient maintain a sense of control and also decrease the emotional burden on the family related to decision making. For example, a patient may choose to switch oxygen devices, even though they deliver the same concentration of oxygen. However, if the patient believes that a different device makes a difference, the switch might be enough to relieve the dyspnea at least briefly. A patient who is breathing by mouth may receive more benefit from a mask than from a nasal cannula; however, a mask can also increase anxiety, which results in worsening dyspnea. When options in respiratory therapy exist, it helps to give the patient a choice.

Management of air hunger also involves the judicious administration of morphine and antianxiolytics for relief of respiratory distress. Table 28-4 summarizes nursing care measures for additional symptoms of terminal disease. Because

► **TABLE 28-4 Promoting Comfort in Terminally Ill Patients**

Symptoms	Characteristics or Causes	Nursing Implications
Discomfort	Any source of physical irritation may worsen pain. As patient approaches death, mouth remains open, tongue becomes dry and edematous, and lips become dry and cracked. Blinking reflexes diminish near death, which causes drying of the cornea.	Provide thorough skin care—including daily baths, lubrication of skin, and dry, clean bed linens—to reduce irritants. Assess for appropriateness of special mattresses. Provide oral care at least every 2 to 4 hours. Use foam or premoistened swabs for frequent mouth care. Apply a light film of water-soluble lubricant to lips and tongue (see Chapter 37).
Fatigue	Metabolic demands of a cancerous tumour cause weakness and fatigue. Exhaustion phase of the general adaptation syndrome causes energy depletion.	Remove crusts from eyelid margins. Administer artificial tears to reduce corneal drying. Help patient identify values or desired tasks; then help patient conserve energy for only those tasks. Promote frequent rest periods in a quiet environment. Time and pace nursing care activities (ensure periods of rest between blocks of care).
Nausea	Nausea may occur as a side effect of medications and as a result of severe pain, as a symptom of certain illnesses, or as a result of palliative chemotherapy or radiation therapy.	Encourage use of energy-saving devices such as mobility aids. Administer antiemetics: provide oral care at least every 2 to 4 hours; offer clear liquid diet and ice chips; avoid liquids that increase stomach acidity, such as coffee, milk, and citric acid juices. Encourage high-calorie nutritional supplements (e.g., Ensure, Boost).
Constipation	Narcotic medications and immobility slow peristalsis. Lack of bulk in diet or reduced fluid intake may occur with appetite changes.	Provide preventive care, which is most effective: increase fluid intake; include bran, whole grain products, and fresh vegetables in diet; encourage exercise (see Chapter 42). Administer prophylactic stool softeners on a regular basis.
Diarrhea	Constipation can add to discomfort. Diarrhea results from disease process (e.g., colon cancer), from complications of treatment or medications, or from fecal impaction caused by constipation.	Administer laxatives as necessary. Assess for fecal impaction (if sudden liquid stool occurs) and treat if required. Provide thorough perineal care if required. Administer antidiarrheals as needed. Confer with physician to change medication if possible. Provide low-residue diet.
Urinary incontinence	Incontinence results from progressive disease (e.g., involvement of spinal cord, reduced level of consciousness).	Protect skin from irritation or breakdown. Implement use of barrier creams to help protect skin integrity. Use disposable incontinence briefs if appropriate. Use indwelling urinary catheter or condom catheters if appropriate (see Chapter 43).
Inadequate nutrition	Nausea and vomiting can decrease appetite. Depression from grieving may cause anorexia.	Serve smaller portions and bland foods, which may be more palatable. Encourage intake of nutritional supplements. Allow home-cooked meals, which may be preferred by patient and gives the family a chance to participate in care.
Dehydration	As disease progresses, patient is less willing or able to maintain oral fluid intake.	Remove factors causing decreased intake; give antiemetics, and apply topical analgesics to oral lesions. Reduce discomfort from dehydration; provide mouth care at least every 4 hours; offer ice chips or moist cloth to lips.
Ineffective breathing patterns (e.g., dyspnea, shortness of breath)	Disease progression that involves lung tissue (e.g., progression of cancer, pneumonia, pulmonary edema) may affect breathing. Anemia reduces oxygen-carrying capacity. Anxiety increases oxygen demand. Fever increases oxygen demand.	Treat or control underlying cause. For example, in some cases of pulmonary edema, a diuretic may be appropriate and may temporarily relieve symptoms. Provide reassurance and comfort measures to the patient. Place patient in semi-Fowler's position, which will help. Maximize patient's oxygenation (e.g., place the patient in semi-Fowler's position or upright; provide supplemental oxygen; maintain a patent airway; reduce anxiety or fever). Administer medications such as bronchodilators, inhaled steroids, or narcotics and antianxiolytics to suppress cough, ease breathing, and alleviate apprehension. Administer antipyretics as needed. Promote comfort through measures such as removing some clothing and bedding.
Confusion, disorientation, and restlessness	These manifestations may be caused by hypoxia, metabolic changes, brain metastases, or medication side effects.	Ensure safe environment. Monitor patient frequently. Reorient the patient as needed. Administer medications as prescribed and as needed.

therapies and clinical practice standards are constantly evolving, you must keep your knowledge current.

Maintaining Dignity and Self-Esteem. The notion of dignity varies from patient to patient and between one circumstance and the next, and it is an overarching value or goal inherent in palliative care (Chochinov, 2006). Personal dignity may revolve around a person's positive sense of self-regard, is individualistic, and is closely linked with the patient's personal goals and social contexts (Chochinov, 2006). Dignity may also revolve around the extent to which patients feel valued and how they are treated by caregivers.

You can promote a patient's self-esteem and dignity by conveying respect for the patient as a whole person with feelings, accomplishments, and passions independent of the illness experience (Chochinov, 2006). Giving importance to autonomy, acceptance, resilience, and maintaining hope acknowledges individual personhood; it also strengthens the empathic, therapeutic communication between the patient, the patient's family, and yourself. Providing time for patients to share their life experiences, particularly about what has been meaningful, enables you to know patients better. Knowing patients then facilitates choice of therapies that promote patient decision making and autonomy.

For many patients, receiving spiritual comfort helps preserve dignity and self-esteem. Facilitating connections to a spiritual practice or community and supporting the expression of culturally held beliefs is very important. Patients may also benefit by being assured that some aspect of their lives may transcend death. In other words, the patient gains comfort from knowing that something of his or her life will continue after death. Participating in a life project such as making an audiotape or videotape for the family, writing letters, or keeping a journal can offer patients the comfort of knowing that something of their essence will survive (Chochinov, 2006). Chapter 27 further discusses some of the spiritual practices and religious rituals that can support people in need of spiritual comfort.

Basic to promoting self-esteem and dignity is attending to the patient's appearance and surroundings. Cleanliness, absence of body odours, attractive clothing, and personal grooming all contribute to a sense of worth. When helping a patient tend to bodily functions, you always show respect, even when the patient becomes dependent. It is important to keep the patient's immediate surroundings pleasant by opening curtains and letting light change from the bright of day to the dark of night. The quick removal of liquid stool or vomitus will help avoid unpleasant odours.

Disabilities experienced by the patient may threaten dignity, especially when caregivers take control of the patient's life. You allow the patient to participate in nursing care decisions (e.g., how and when to administer personal hygiene, diet preferences, and timing of nursing therapies). You keep the patient and family well informed about planned therapies, their purpose, and anticipated effects. It is also important to provide the patient with privacy during nursing care procedures and when the patient and family need time together.

Preventing Abandonment and Isolation. Many terminally ill patients are fearful of dying alone. Therefore, it is important for you to answer the call light quickly and to explain when staff will be giving care and performing assessments throughout the day and night. You should establish presence and use appropriate touch when performing care measures. You must be available to answer questions, even if

data are not needed, no further decisions are left to make, or no further curative interventions are available (Radwany et al., 2009). Patients may feel a sense of involvement when sharing a room and interacting with staff. Patients can share conversation and companionship with roommates and visitors. The choice of private or shared room should be discussed with the patient and family whenever possible.

Family is always considered as the unit of care in palliative care. If family members have difficulty accepting the patient's impending death, they may avoid visitation, exhibit denial, or express unrealistic expectations. When family members do visit, it is important to talk with them and keep them informed of the patient's progress. It may be useful to give family members helpful hints about what to discuss with patients. For example, you can help improve the family member's communication skills by role modelling attentive listening and offering reassurance. You should encourage the family to discuss activities other family members are involved in, reminisce about enjoyable times, and inquire about the patient's concerns. It is important for you to advocate for the patient to ensure that the patient does not become exhausted by visits. A useful strategy is to establish a schedule for family to be in attendance or to suggest family or friends visit two at a time. It is also helpful to find simple and appropriate care activities for the family to perform, such as feeding the patient, washing the patient's face, combing hair, and filling out the patient's menu. Older adults often become particularly lonely at night and may feel more secure if a family member stays at the bedside during the night. You should allow visitors to remain with dying patients at any time if the patient wants them. Also, you must know how to contact family members at any time if the patient requests a visit or if the patient's condition worsens.

Providing a Comfortable and Peaceful Environment. You keep a patient comfortable through frequent and regular repositioning, keeping bed linens dry, and controlling extraneous environmental noise. Pictures, cherished objects, cards or letters from family members and friends, and plants and flowers create an environment that is more familiar and comforting. You offer the patient frequent back, lower leg, and foot massage, or guided imagery exercises, and allow the patient time to listen to preferred types of music. A comfortable, pleasant environment helps patients relax, which promotes the ability to sleep and minimizes severity of symptoms.

Fear of Dying and Death. People are afraid of dying and death for many different reasons: the process of dying, with its associated pain and loss of dignity; not knowing what will happen after death; and dying before fulfilling dreams and goals. The intensity of the fear varies with each person and his or her circumstances, including age, culture, sex, personal experiences, family situation, social supports, and religious beliefs. Melvin and Oldham (2009) pointed out that nurses need to help patients realistically appraise these fears. Nurses also need to listen and understand as patients express their emotions.

Support for the Grieving Family. The family may be the primary caregivers when the patient chooses to die at home. Family members need support, and they benefit from being taught ways to care for their loved one (Box 28-9). Caring for a family member can be emotionally stressful and physically exhausting for the family caregiver. Not all families can manage care on their own. In the home setting, you provide the opportunity for the family to be temporarily relieved of duties so that they can rest. Such respite care is a resource

BOX 28-9 PATIENT TEACHING

Preparing the Dying Patient's Family

Objectives

- Improve the family's ability to provide appropriate physical care for the dying patient in the home.
- Improve the family's ability to provide appropriate psychological support to the dying patient.

Teaching Strategies

- Describe and demonstrate feeding techniques and selection of foods to facilitate the patient's ease of chewing and swallowing.
- Demonstrate bathing, mouth care, and other hygiene measures, and allow the family to perform return demonstration.
- Show the family a video on simple transfer techniques to prevent injury to themselves and the patient; help the family practise these techniques.
- Instruct the family on the need to take rest periods.
- Teach the family to recognize signs and symptoms to expect as the patient's condition worsens, and provide information on whom to call in an emergency.
- Discuss ways to support the dying patient, and listen to needs and fears.
- Solicit questions from the family, and provide information as needed.

Evaluation

- Ask the family members to demonstrate physical care techniques (e.g., turning, feeding, mouth care).
- Ask the family members to describe how they vary approaches to care when the patient has symptoms such as pain or fatigue.
- Ask the family to discuss how they feel about their ability to support the patient.



available through hospice programs, in which respite workers can come into the home, or a patient can go to a facility for a respite stay.

Families also need to be informed of home care, hospice, and community service options so they can choose among the resources available. The Saint Elizabeth Health Care Foundation in Canada has sponsored a free-of-charge publication called *Family Hospice Care: Pre-Planning and Care Guide*. This is a practical and informative resource written to help families meet the needs of terminally ill loved ones (van Bommel, 2006). Each province and health region has varying resources; therefore, you are required to know what is available to them in the individual family's jurisdiction. In some cases, families may need assistance and support in making the decision about placement in a health care facility.

You must keep the family informed so that they can anticipate the type of symptoms the patient will probably experience and the implications for care. You encourage family members to express their grief openly with the patient and to give the patient the opportunity to discuss any remaining concerns or requests. The family also needs personal time to share their concerns with you and to ask questions about treatment options, the course of the patient's disease, and the meaning of the patient's behaviours. It is wise for you to communicate news of the patient's impending death when the family is together, if possible. Family members can provide support for

one another. Convey the news in a private area, and be willing to remain with the family as needed. In some situations in which families are large or cannot all be together, it may be beneficial to have a designated family spokesperson or representative through whom information can be relayed.

It is important for you to educate the family regarding the signs of impending death. Tissue perfusion becomes impaired, which results in cool and clammy skin. Alterations in heart rate or rhythms, hypotension, and pooling of blood in dependent areas may occur. The extremities often have a mottled appearance. Breathing patterns may be impaired. Patients may exhibit shortness of breath or increased secretions. Later signs include increasingly longer and more frequent periods of apnea, alternating with hyperpnea; this pattern is known as Cheyne-Stokes respirations. Patients may exhibit alterations in level of consciousness and changes in behaviour; for example, disorientation and restlessness may occur. Urine output decreases, and incontinence may occur. In addition, periods of sleep increase, and eventually some patients may become unconscious as death nears.

In the hospital setting, you assist in planning a visitation schedule for family members to keep the patient and family from excessive fatigue. Young children should visit dying parents. During the final moments of a patient's life, you help the family to stay in communication with the patient through frequent visits, caring silence, attentive listening, touch, and telling the patient of their love. After the patient's death, you need to encourage the family to remain with the deceased for as long as they feel they need to. You are required to provide support and assist the family with decision making, such as notification of a funeral home or mortician, transportation of additional family members, and collection of the patient's belongings.

Hospice Care. Hospice care is an alternative care delivery model for terminally ill patients. It is one phase of palliative care. **Hospice** is not necessarily a facility but a concept for family-centred care designed to assist the patient in being comfortable and maintaining a satisfactory lifestyle until death. Hospice services are available in the home, hospital, stand-alone facilities, and long-term care settings. Availability and accessibility vary across Canada. Hospice care programs include the following components:

- Patient and family as the unit of care
- Coordinated home care with access to beds in available inpatient and long-term care facilities
- Control of symptoms (physical, sociological, psychological, and spiritual)
- Physician-directed services
- Provision of an interdisciplinary care team of physicians, nurses, spiritual advisors, social worker, and counsellors
- Availability of medical and nursing services at all times
- Bereavement follow-up after a patient's death
- Use of trained volunteers for frequent visitation and respite support

Canada's first hospice was established in Toronto in 1979. Casey House in Toronto and the John Gordon home in London, Ontario, provide hospice care for people dying from AIDS. Canuck Place, in Vancouver, was the first freestanding children's hospice in North America and provides a continuum of care that comprises three components: respite, palliative, and bereavement.

Your role in hospice care is to meet the primary wishes of the dying patient and to be amenable to individual desires of each

patient. You support a patient's choice in maintaining comfort and dignity. Whether the patient ultimately dies at home or in a health care facility, the patient's wishes are followed with the understanding that whatever his or her choice, it is made "for the good of all who are involved." When options are complicated by family needs, hospice professionals will try to work with the patients' wishes. A hospice program emphasizes palliative care with the patient and family as active participants. Patient care goals are mutually set, and all participants fully understand the options and desires of the patient. The hospice team attempts to meet the patient's desires and to encourage the family to stay within those guidelines. One or more bereavement visits are often made by the staff of the hospice team to the family even after the death of the patient to help the family move through the grieving process successfully.

Many patients prefer to die at home in a familiar setting, whereas others, not wishing to burden their families, choose to die in a hospital or long-term care facility. Alternatively, some families are ill-prepared or unable to care for a patient at home. It is important that the hospice team know the patient's preference. Many patients suffer physical ailments that prevent them from being cared for at home despite the willingness of family and friends to care for the patient. The health and welfare issues are viewed from a broader perspective than just the patient's desires. The concern for family needs is also taken into consideration by the hospice team.

A patient receiving hospice care may be hospitalized because of a change in condition or exacerbation of symptoms, and the health care team coordinates care between the home and inpatient setting. An effort is always made to keep patients at home for as long as possible. The family provides basic supportive care. However, if the family cannot meet all of the patient's needs, a nurse is available to coordinate and administer symptom management therapies. The goal of the interdisciplinary team is 24-hour accessibility as needed. As a patient's death becomes imminent, members of the hospice team are available to give support to the patient and family.

Care After Death. When a patient dies in a hospital setting, you provide **postmortem care**. It is important to care for the patient's body with dignity and sensitivity and in a manner consistent with the patient's religious or cultural beliefs. After death, the body undergoes many physical changes. For that reason, care must be provided as soon as possible to prevent tissue damage or disfigurement of body parts.

Hospitals are required to formulate policies and procedures that are based on current provincial and territorial laws to validate death, identify potential organ or tissue donors, and provide postmortem care. For transplantation of organs, the patient must be maintained in an intensive care unit on ventilatory and circulatory support until vital organs are harvested. The family must clearly understand that the patient is "brain dead" and that the equipment (i.e., ventilator and vasopressor medications) is not keeping the patient alive but keeping the physical body in a state so that the organs will not be damaged before being harvested.

Family support is crucial at the time of the patient's death. If family members are not present at that time, the assigned nurse (or another staff member who knows the family) makes contact with the family. If you are the assigned nurse, you inform the family of the death and respond to any immediate questions from the family. It is important that you find out from the family whether they will come to the facility to view

the deceased and to collect any personal belongings. Make a note of which family members will come and when. In some situations, family members may be too distraught to safely drive themselves and need to be encouraged to have someone else drive or to take alternative transportation. After a death, it is acceptable to lower the head of the bed, to straighten the body, and attempt to gently close the eyes and mouth. Once the family has arrived to view the deceased, it is beneficial, before they view the body, for you to explain to the family what they may expect to see. Typically, a deceased person has a peaceful expression (as facial muscles have relaxed); however, the body feels cool to touch and appears greyish-white. Within several hours, the body begins to stiffen as rigor mortis sets in. The body may have areas of pooled blood that appear bruised. The eyes and mouth may be partially open, but mucous membranes will appear dry. This appearance may be difficult for some family members to observe.

You can be very helpful in supporting families through the organ and tissue request process. It is important to provide a private area in which to discuss all issues with the family. The staff member designated to make a request, such as a formal transplant coordinator, a social worker, chaplain, or you, must offer the family clarification of what defines brain death because support systems must remain in place even after the patient is pronounced "dead" for vital organ retrieval (i.e., heart, lungs, kidneys, and liver). You reinforce explanations throughout the organ retrieval process. The family must know who legally can give final consent, the options for organ or tissue donation, any associated costs, and how donation will affect burial or cremation. Nonvital tissues such as corneas, skin, long bones, and middle ear bones can be harvested when the patient is proclaimed dead without artificially maintaining vital functions. If the patient did not make specific documented requests before death, the family must agree on organ and tissue donation. You should review the organ retrieval laws in the family's province or territory, as well as your institution's policy and procedure regarding the formal consent process.

Another topic that creates tension or anxiety is autopsy. The physician usually asks for permission for an autopsy, but nurses are often the professionals who answer questions and support the family's choices. It is very difficult to approach a grieving family with such a request; ideally, the topics of autopsy and donation are discussed before the patient's death. The value of an autopsy is that it may improve knowledge in the field of medicine or bring answers or clarification for the family. To help the living, the autopsy can lead to new therapies or new understanding of diseases. The more reasons you can think of to support organ donation, tissue donation, or autopsy, the more the family will be helped to realize the good that can be accomplished by either donation or research autopsy.

Patients' and families' cultural beliefs are very important in postmortem care (see Chapter 9). Maintaining the integrity of rituals and mourning practices helps families accept the patient's death and achieve an inner peace. The ethical decisions that surround a patient's death are based on the values of a culture. Health care providers must determine the makeup of a family network and which members should be involved in decisions such as organ donation and end-of-life care.

You are responsible for coordination of all aspects of care surrounding a patient's death. Box 28-10 summarizes the nurse's and physician's responsibilities for care of the body after death. It is important for you to be familiar with institutional policies and procedures that are established for

► BOX 28-10 Procedural Guideline

Care of the Body After Death

Delegation Considerations:

Care of the body after death can be delegated to unregulated care providers except in cases of organ or tissue donation. Check agency policy for which staff member is authorized to remove any invasive tubes or catheters.

Equipment:

Bath towels, washcloths, wash basin, scissors, shroud kit with name tags, bed linen, room deodorizer, documentation forms.

Procedure:

1. Physicians must complete the death certificate: cause of death, time when death was pronounced, therapy used, and actions taken. In some provinces such as British Columbia, nurses may pronounce the death but may not complete the death certificate. (This may not be the policy in all agencies. Follow your agency's policy.)
2. Physicians may request an autopsy, especially for deaths under unusual circumstances.
3. Trained staff members offer survivors the option of donating the organs or tissue of the deceased; personal, religious, and cultural needs should be included during this process.
4. Nurses work with sensitivity to preserve the patient's and family's dignity.
 - A. Check orders for any specimens or special orders needed by the physician.
 - B. Make arrangements for staff, spiritual advisor, or others to stay with the family while the body is prepared for viewing; find out whether survivors have special requests for viewing (e.g., shaving, a special gown, Bible in hand, rosary at the bedside).
 - C. Before shaving of male patient: Determine whether the family wishes the patient to remain unshaven if it was his custom to wear a beard. Determine whether patient's religion or culture has a preference regarding facial hair.
 - D. Remove all equipment, tubes, supplies, and dirty linens according to agency protocol. Exceptions to this process include organ donation (leave support systems in place), and sudden or unexpected deaths that necessitate coroner involvement or investigation (leave tubings and lines in situ, but cut them near the body and clamp them).
 - E. Cleanse the body thoroughly, apply clean sheets, and remove all trash from the room.
 - F. Brush and comb the patient's hair. Apply any personal hairpiece.
 - G. Position according to protocol: The eyes should be closed by gently holding the patient's eyelids closed for a few minutes; dentures should be in the patient's mouth to maintain facial alignment.
 - H. Cover the body with a clean sheet up to the chin with arms outside covers if possible.
 - I. Lower the lighting, and spray a deodorizer if possible to remove unpleasant odours.
 - J. Give the family the option to view or not to view the dead body; clarify that either option is acceptable.
 - K. If family members choose to view the dead body, go with them.
 - L. Encourage the family to say goodbye through both touch and talk.
 - M. Do not rush the goodbye process. Once the family is more comfortable, ask if they would like to be left alone. Remind them that they can call you if they need to.
 - N. Clarify which personal belongings should stay with the body and who will take personal items; documentation requires both a descriptor of the objects (i.e., rings, jewellery, electronics) and the name of each person who received them, with the time and date.
 - O. Do not discard items found after the family is gone; call the family and tell them what was found and ask who might pick it up. Descriptions of the articles help the patient's family make decisions accordingly.
 - P. Apply name tags according to protocol, such as on the wrist, on the right big toe, or outside a shroud.
 - Q. Complete documentation in the nursing notes. Documents vary, depending on the agency (see Box 28-11).
 - R. Remain sensitive to other hospitalized patients or visitors when transporting the body, such as covering the body with a clean sheet, temporarily and gently closing doors to patients' rooms, and watching to avoid visitors when moving the body to another part of the hospital or to the exit for the funeral home.
 - S. Follow all protocol and policies to meet all legal requirements in caring for the body.

postmortem care. Many of these practices also depend on the individuals' unique experiences and preferences.

The family becomes the primary patient when the actual death has occurred, and the shift of concern moves from the deceased patient to the living family. At this time, it is important to appropriately use the resources that are available. For example, pastoral care staff can be a helpful resource to assist the family even before the actual death, if no bereavement team is available. However, it is important to know whether the family chooses to have spiritual counsellors present. Some families prefer to grieve alone, whereas others may desire the support of other people. Social workers and counsellors can also offer assistance. If the family's expectations for support are unknown, any professional who assists the family can ask the simple questions and make suggestions for assistance.

Documentation of all the events surrounding a patient's death is important for avoiding misunderstandings and clarifying final events in a patient's life. Each facility's policies and procedures support legal guidelines that must be followed and accurately documented. Box 28-11 lists the content to be

documented about end-of-life care. Documentation validates the success of meeting goals identified for the patient or provides a justification for failure to meet any goals. Complete and accurate documentation offers a summary of activities that can become the focus for risk management or legal investigations.

A physician or coroner must sign some of the medical forms, but the registered nurse must record most of the forms. Gathering of information for the forms may be delegated to unregulated care providers, but you must chart the data in the nurse's notes. A licensed professional should witness the signing of forms.

In cases of legal matters, the family expects a clear, concise description of what occurred in the care of the patient at the time of death. Opinions must be avoided, and facts are stated in a nonjudgemental, objective manner. Provincial and territorial guidelines direct the type of information that is to be charted and when it is to be charted. Patients have the right to access their health records. Copies of parts of the chart can be given to family members upon written request and the

► BOX 28-11

Documentation of End-of-Life Care

The following items must be documented at the end of a patient's life:

- Time of death and actions taken to prevent death, or cardiac arrest record if applicable
- The name of the person who pronounced the patient's death
- Any special preparation and type of donation, including time, staff, and company
- The name of the family member or friend who was called and who came to the hospital: donor organization, morgue, funeral home, chaplain, and individual family members making any decisions
- Personal articles left on the body and taped to skin, or tubes left in
- Personal items given to the family: specific names and descriptors of items
- Time of discharge and destination of the body
- Location of name tags on the body
- Special requests made by the family
- Any other statements that might be needed to clarify the situation

approval of the physician and hospital (see your employer's guidelines). You must understand and uphold the legal guidelines of documentation at all times (see Chapter 15).

The Grieving Nurse. When you have cared for a patient for a period of time, it is possible to have deep personal feelings of loss and sadness when the patient dies. It is common for nurses to want to hold the hand of the patient who is dying. By being present at the time of the patient's death, you are able to "let go."

You can attempt in many ways to cope with the loss of a dying patient. Attending the viewing at the mortuary or funeral is one way to say goodbye. Writing a letter of sympathy to the family can prove helpful. Some agencies routinely send out sympathy cards from the interdisciplinary team, in which you can write an individual note. It is natural for you to go through the grieving process. When you work in an area in which multiple losses occur, it is easy for bereavement overload to develop unless you have ways to process grief. You might feel frustration, anger, guilt, sadness, or anxiety. Often nurses seek out other nurses or health care providers to discuss their own grief (Figure 28-5). It is important for you to develop your own support systems that allow time away from the care setting and provide opportunities to share personal feelings. Stress management techniques (see Chapter 29) can help restore a nurse's energy and continued enjoyment in caring for patients. Your self-care is crucial for your survival and recovery from loss, not only for your sake but also for the sake of future patients. Interdisciplinary team debriefings regarding complex or ethical issues are valuable in helping you cope with loss. Nurse managers and administrators have a responsibility to ensure that the working environment is supportive (Rollings, 2008).

❖ Evaluation

Patient Care

You care for patients and families at every phase of the grief process. This requires you to remain aware of signs and

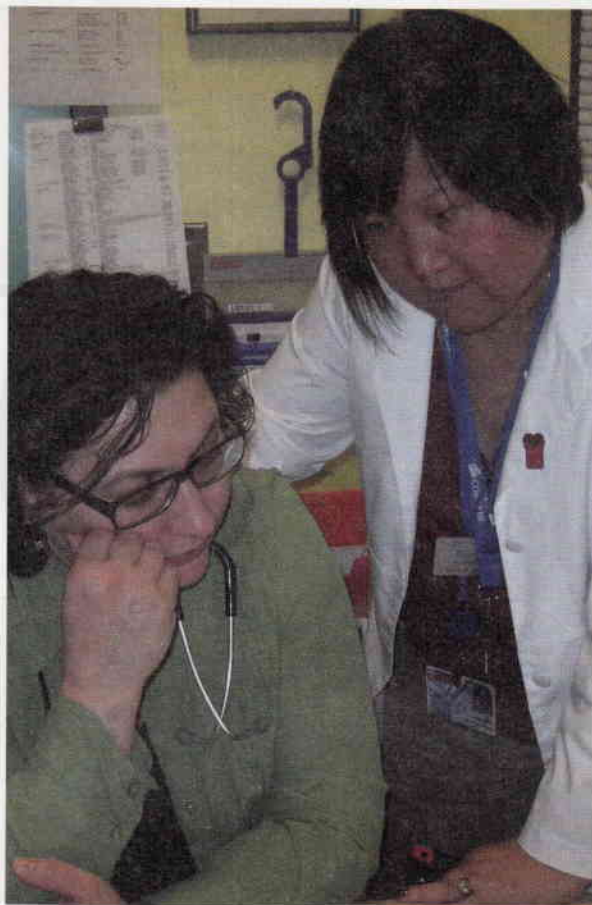


Figure 28-5 Nurses benefit from support of colleagues during their time of loss.

symptoms of grief, even when patients are not specifically seeking care directly related to a loss. These signs and symptoms help you evaluate whether a patient is able to deal with a loss and progress through the grief process. Critical thinking ensures that the evaluation process is thorough and relevant to the patient's situation (Figure 28-6).

To determine the effectiveness of nursing interventions, you must refer to the goals and expected outcomes established in the plan of care. By comparing actual patient behaviours with expected outcomes, you evaluate the patient's health status and whether the plan needs to be revised. For example, if the goal is to have the patient communicate a sense of hope with family members, you evaluate the verbal and nonverbal communication process for cues related to hope. The patient's responses indicate whether new therapies are needed or whether existing therapies should be revised. You continue to evaluate the progress of the patient, the effectiveness of interventions, and the interactions between the family and patient. It is important for the patient and family to share experiences and be active participants in the evaluation process.

Patient Expectations

The patient expects individualized care, including relief of symptoms, preservation of dignity, and support of the family to maximize quality of life. The success of the evaluation depends partially on the bond that you form with the patient.

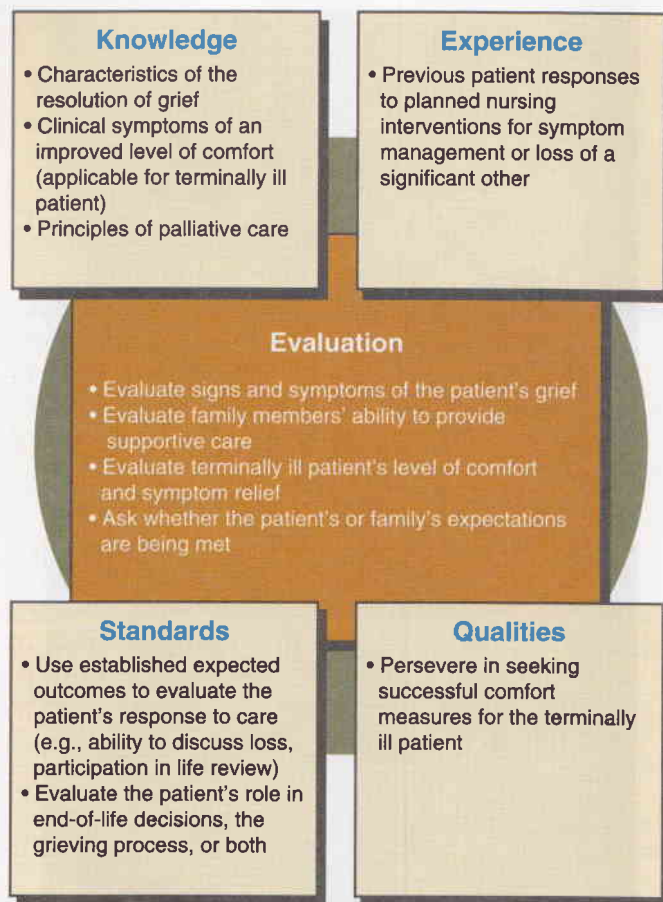


Figure 28-6 Critical thinking model for loss, death, and grieving evaluation.

If the patient does not trust you, he or she is not likely to share personal expectations or desires with you. It becomes important for you to take the time to talk with the patient and learn whether expectations are being met. The following are examples of questions that will validate whether patient expectations have been achieved:

- "Am I helping you in the way you have hoped?"
- "Would you like me to assist you in a different way?"
- "Do you have a specific request that I have not yet met?"
- "What is most important for us to do for you at this time?"
- "Are we dealing with your problems in a timely manner?"

Through communication and evaluation, you continue to determine whether outcome criteria were met to support the goals of care. It is often easy to evaluate the patient's needs, but evaluating the family's needs is more complex. Once rapport is established, you must be vigilant to avoid problems that threaten that rapport.

✦ KEY CONCEPTS

- When caring for patients who have experienced a loss, you facilitate the grief process by assisting survivors in feeling the loss, expressing the loss, and moving through the tasks of the grief process.
- Loss comes in many forms, depending on the values and priorities learned within a person's sphere of influence, which includes family, friends, society, and culture.

- The type of loss and the perception of the loss influence the degree of grief a person experiences.
- Death is difficult for the dying person, as well as for the person's family, friends, and caregivers.
- Survivors go through a bereavement period that is not linear; rather, a grieving individual will move back and forth through a series of stages, tasks, or both many times, possibly over a period of several years.
- Several theorists have formulated stages of the grieving process and a series of tasks for survivors to successfully complete their bereavement and adapt to life with a loss.
- Your knowledge of the types of grief enables you to implement appropriate bereavement therapies.
- The way an individual perceives and responds to a loss is influenced by development, psychosocial perspectives, socioeconomic status, personal relationships, the nature of the loss, culture, and spiritual beliefs.
- Nursing interventions involve reinforcing patients' successful coping mechanisms and introducing new coping approaches, such as the promotion of hope.
- When assessing patients in grief, you do not assume how or whether patients experience grief or whether a particular behaviour indicates grief; rather, you allow patients to share in their own way what is happening.
- You must assess the terminally ill patient's and family's wishes for end-of-life care, including the preferred place for death, the level of life-sustaining measures to use, and expectations regarding pain and symptom management.
- You develop a plan of care by integrating patients' resources such as physical energy and activity tolerance, supportive family members, spiritual faith, and methods for coping.
- You establish a caring presence and use therapeutic communication strategies that enable patients to discuss their loss and find ways to manage it.
- Palliative care enables patients to make more informed choices, better alleviate symptoms, and have more opportunity to manage unfinished business.
- You can promote a patient's self-esteem and dignity by conveying respect for the patient as a whole person.
- Hospice is not a facility but a concept for family-centred care designed to assist the patient in being comfortable and maintaining a satisfactory lifestyle until death.

✦ CRITICAL THINKING EXERCISES

1. Mr. Singh visits the community health clinic and tells you, "I don't know what's wrong with me. I lost my wife six months ago and I still get angry that God let her die. I still miss her so much. I have been going out with friends, but I just don't enjoy it that much. Sometimes I wake up at night and I think my wife is still here. What is wrong with me? I thought I would be feeling better by now." How could you respond to Mr. Singh?
2. You are assigned to care for Mrs. Nester. She has bone cancer and has experienced ongoing deep pain in her back and hips, with some discomfort also in her lower extremities. Discuss the management of pain for Mrs. Nester.
3. A nursing colleague is discussing her patient with you. She says, "My patient is a 48-year-old man with a degenerative neurological disease. The disease is progressive. He is having trouble walking and taking care of his daily needs. The only thing I can do is assist him with bathing, feeding, and walking. He really is not a candidate yet for palliative care." What would be your response to your colleague?

✦ REVIEW QUESTIONS

1. A child is grieving over the loss of a pet. This is an example of
 1. An actual loss
 2. A perceived loss
 3. A situational loss
 4. A maturational loss
2. A middle-aged man comes to a community clinic for his annual flu shot. In the discussion, you learn that he still works at a local law firm. However, he has recently lost two important cases, and his boss has been pressuring him "to turn it around." The patient may be experiencing
 1. An actual loss
 2. A perceived loss
 3. A situational loss
 4. A maturational loss
3. The community health nurse's job is to provide grief counseling for the residents of a community in which a major flood has occurred. The loss associated with flooding is best described as
 1. An actual loss
 2. A perceived loss
 3. A situational loss
 4. A maturational loss
4. A patient has received a diagnosis of terminal brain cancer. When you visit him during rounds, he asks you whether the cancer could have been caused by something he ate or by exposure to some chemical toxin. The patient is probably experiencing
 1. Bowlby's phase of numbing
 2. Kübler-Ross's stage of acceptance
 3. Worden's tasks of emotionally relocating
 4. Bowlby's phase of disorganization and despair
5. According to Kübler-Ross's stages of dying, a patient may feel overwhelmingly lonely and withdraw from interpersonal interaction during this phase:
 1. Denial
 2. Anger
 3. Bargaining
 4. Depression
6. Since the death of his wife, the patient has assumed full responsibility for the care of his children. He has noticed over the past few weeks that friends are calling less often. He is most likely in which of the following phases of mourning?
 1. Anticipatory grieving
 2. Worden's task 3 of mourning
 3. Kübler-Ross's phase of bargaining
 4. Bowlby's phase of disorganization and despair
7. Which of the following is one of the most common and difficult issues faced by older bereaved spouses?
 1. Adjusting to physical problems
 2. Overcoming mental health problems
 3. Completing the tasks of daily living
 4. Managing finances
8. "Patient will express hopefulness that cancer treatment will control symptoms" is an example of
 1. A goal
 2. An intervention
 3. A plan
 4. An expected outcome
9. A 16-year-old patient has been admitted to the intensive care unit after suffering a closed-head injury. The patient is soon declared brain dead. The physician and nurse are preparing to approach the family to consider donation of the patient's heart and lungs. When working with families in this situation, it is important to explain that
 1. The ventilator is being used to prevent brain death
 2. The ventilator maintains organ perfusion until time for harvesting
 3. Tissues such as corneas can be harvested only if the patient remains ventilated
 4. Organ donation can occur only if the patient has made a request to donate organs in the past
10. Which of the following types of care allows patients to make more informed choices, achieve better alleviation of symptoms, and have more opportunity to manage unfinished business?
 1. Acute care
 2. Mourning care
 3. Palliative care
 4. Terminal care

✦ RECOMMENDED WEB SITES

Bereaved Families of Ontario: <http://www.bereavedfamilies.net>

This Web site provides support programs and resources for people of all ages who have lost a family member.

Canadian Hospice Palliative Care Association: <http://www.chpca.net/index>

The Canadian Hospice Palliative Care Association (CHPCA) is a national organization that promotes excellence in care for people approaching death. One of its goals is to advocate for improved hospice palliative care policy, resource allocation, and supports for caregivers.

Regional Palliative Care Program in Edmonton, Alberta: <http://www.palliative.org>

The objective of this program is to provide information to health care providers that will help them to reflect on their practice with the terminally ill. This Web site offers palliative care tips, nursing notes, a caregiver guide, and links to publications and other resources.

Victoria Hospice: <http://www.victoriahospice.org/>

This Web site has many useful resources and tools for families, patients, volunteers, and professionals. Literature may be downloaded and/or ordered from this site.

Health Canada, Palliative and End of Life Care: <http://www.hc-sc.gc.ca/hcs-sss/palliat/index-eng.php>

This federal government Web site includes information on the involvement of the federal government in palliative care and contains links to publications and other related resources.

Review Question Answers

1. 1; 2. 2; 3. 3; 4. 4; 5. 4; 6. 2; 7. 3; 8. 4; 9. 4; 10. 3

Rationales for the Review Questions appear at the end of the book.

Stress and Adaptation

Written by Marjorie Baier, RN, PhD, and Kathy Hegadoren, RN, PhD

objectives

Mastery of content in this chapter will enable you to:

- Define the key terms listed.
- Describe how stress is conceptualized.
- Define the key biological systems involved in stress responses.
- Describe how overwhelming stress or chronic stress can affect health.
- Differentiate acute stress disorder and post-traumatic stress disorder.
- Discuss the integration of stress theory with nursing theories.
- Formulate nursing diagnoses from assessment data.
- Describe stress management techniques beneficial for coping with stress.
- Discuss the process of crisis intervention.
- Develop a care plan for patients experiencing stress.
- Discuss how stress in the workplace can affect health care providers.

key terms

- | | |
|----------------------------------|---|
| Acute stress disorder, p. 477 | Flashbacks, p. 477 |
| Adaptation, p. 473 | General adaptation syndrome, p. 473 |
| Alarm reaction, p. 473 | Homeostasis, p. 473 |
| Appraisal, p. 473 | Post-traumatic growth, p. 476 |
| Burnout, p. 485 | Post-traumatic stress disorder (PTSD), p. 477 |
| Coping, p. 473 | Primary appraisal, p. 473 |
| Crisis, p. 473 | Resistance stage, p. 473 |
| Crisis intervention, p. 486 | Secondary appraisal, p. 473 |
| Developmental crises, p. 473 | Situational crises, p. 473 |
| Distress, p. 476 | Stress, p. 472 |
| Endorphins, p. 475 | Stressors, p. 472 |
| Eustress, p. 476 | Trauma, p. 476 |
| Exhaustion stage, p. 473 | |
| Fight-or-flight response, p. 473 | |

media resources

evolve WEBSITE

<http://evolve.elsevier.com/Canada/Potter/fundamentals/>

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- Weblinks

Stress: Everyone has experienced it, but the term **stress** is difficult to define and is often loosely used. It has been used to describe a stimulus, a process, a response, and a state, which leads to confusion and ambiguity (Le Moal, 2007). In this chapter, the term **stressors** is used to describe events that activate stress response systems: that is, act as stimuli. This activation of multiple biological systems and psychological schemas has a collective goal of maintaining a state of dynamic equilibrium. Stressors can arise in the external environment and range from motivational prompts, such as taking a school examination, to devastating personal events, such as a life-threatening illness, a motor vehicle crash, a sexual assault, or a natural disaster (e.g., an earthquake or a tornado). Internal stressors, such as hunger or infection, can also activate stress response systems. Behavioural responses to stressors presumably reflect the activation of numerous biological systems. Behavioural responses can

change over time, inasmuch as previous stressful experiences and individual contextual factors can produce **adaptation** in stress response systems. Among animals, biological systems help alert the animal to some type of threat in the environment and prepare it to mount a defence. These systems also turn off when the threat is past. For humans, in addition to acute threats to body integrity, psychological well-being and sense of self-worth can be threatened. Physical and psychological health can be severely affected by serious or chronic stressors, and these effects can be long-standing and pervasive. It is important for health care providers to understand conceptual frameworks that have been developed to explain the relationship between stress (overwhelming or chronic) and health.

Conceptualizations of Stress

Physiological Conceptualizations

Walter Cannon was one of the pioneers of the early twentieth century who laid the groundwork for regulatory physiology and concepts of adaptation. He demonstrated that the sympathetic-adrenal-medullary (SAM) system acted to maintain homeostasis of the internal environment. He first coined the term **fight-or-flight response**, in 1915, to describe an animal's response to threats through the activation of the SAM system (Figure 29-1; Le Moal, 2007). Hans Selye, another pioneer, focused on maladaptation and the pathology of stress. He demonstrated the existence of a biological stress syndrome, which he called the **general adaptation syndrome** (Selye, 1974; Figure 29-2). This three-stage syndrome occurs in response to serious stressors. The first stage is the **alarm reaction**, analogous to Cannon's fight-or-flight response to stress. In this stage, complex physiological changes help the organism mobilize energy and react to the stressor. The second stage of the general adaptation syndrome is the **resistance stage**. During

resistance, the organism maintains arousal while the body works to defend against and adapt to the stressor and maintain homeostasis. Should the stressors continue for an extended period, organisms use up their finite ability to adapt, and they enter a third stage of the adaptation syndrome, called the **exhaustion stage**. This is a pathological state in which organisms start showing diverse health consequences, which may eventually result in death. Selye was also the first to emphasize the role of the pituitary-adrenal axis in the pathological processes of stress.

At this point, two systems for stress were proposed: (1) the SAM system for behavioural fight-or-flight responses to stress and immediate adaptation and (2) the pituitary-adrenal axis for maintaining homeostasis. The concept of the pituitary-adrenal axis was expanded to the hypothalamic-pituitary-adrenal (HPA) axis; this axis is thought to mediate a bidirectional brain-body communication during physiological and psychological stress and is activated to promote homeostasis and to adapt to threatening or stressful situations (Engelmann & Ludwig, 2004). Bruce McEwan (2007), elaborating on the concept of **homeostasis** (the return of systems to a stable set point), used the term **allostasis** to describe how serious stressors can change physiological set points through adaptation. In this way, organisms are readied to respond and adapt to future stressors, but maintaining this state of readiness has an energy cost. This cost is termed **allostatic load**, which refers to the physiological burden of repeated stressors and enduring a heightened stress response system. When this load becomes too great, stress responses change from adaptation to health problems and stress-related disorders.

Psychological Conceptualizations

In addition to physiological models of stress and stress responses, cognitive approaches to stress were also studied. The general adaptation syndrome and fight-or-flight responses to stress did not explicitly take into account perceptions and appraisals of stress in humans. Researchers began to look at the relationship between the person and the environment. The roles of perception and appraisal in stress responses are integral in the framework of stress proposed by Richard Lazarus. Lazarus (1999) maintained that a person is under stress only if the person evaluates the event or circumstance as personally significant. **Appraisal** of an event or circumstance is an ongoing perceptual process (Aguilera, 1998). Evaluating an event for its personal meaning is called **primary appraisal**. If as a result of primary appraisal the person identifies the event or circumstance as a harm, loss, threat, or challenge, the person experiences stress. If stress is present, **secondary appraisal** focuses on possible coping strategies. **Coping** is the active process of managing taxing circumstances, expending effort to solve personal and interpersonal problems, and seeking to master, minimize, reduce, or tolerate stress or conflict. Balancing factors contribute to restoring equilibrium.

If previous ways of coping are not effective, a **crisis** may occur, in which the person faces a turning point in life and the person must change. Caplan (1981) distinguished two types of crises: those associated with changing developmental levels, or **developmental crises**, and **situational crises**. Examples of developmental crises could be related to mastering developmental tasks as an individual (independence in adolescence) or as a family (children leaving home, caregiving to elderly parents). Examples of situational crises could include natural disasters like floods or famine, the end of an intimate

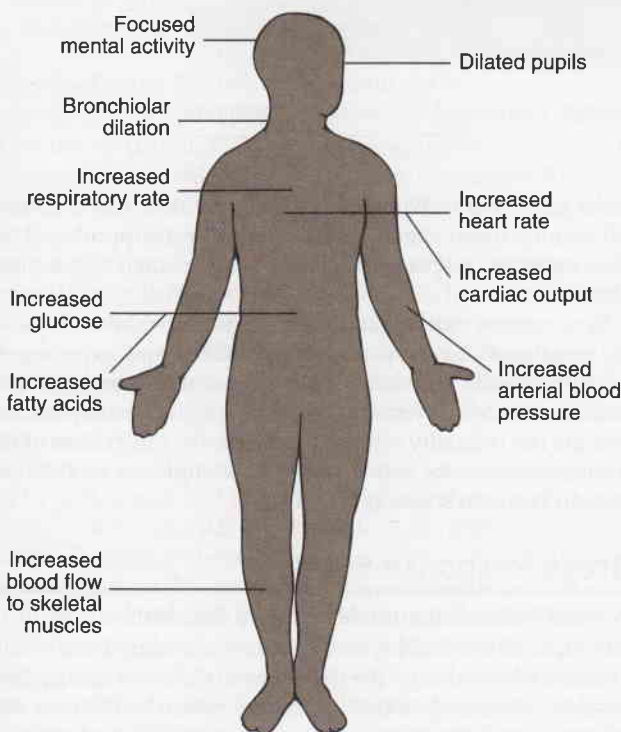


Figure 29-1 Fight-or-flight response.

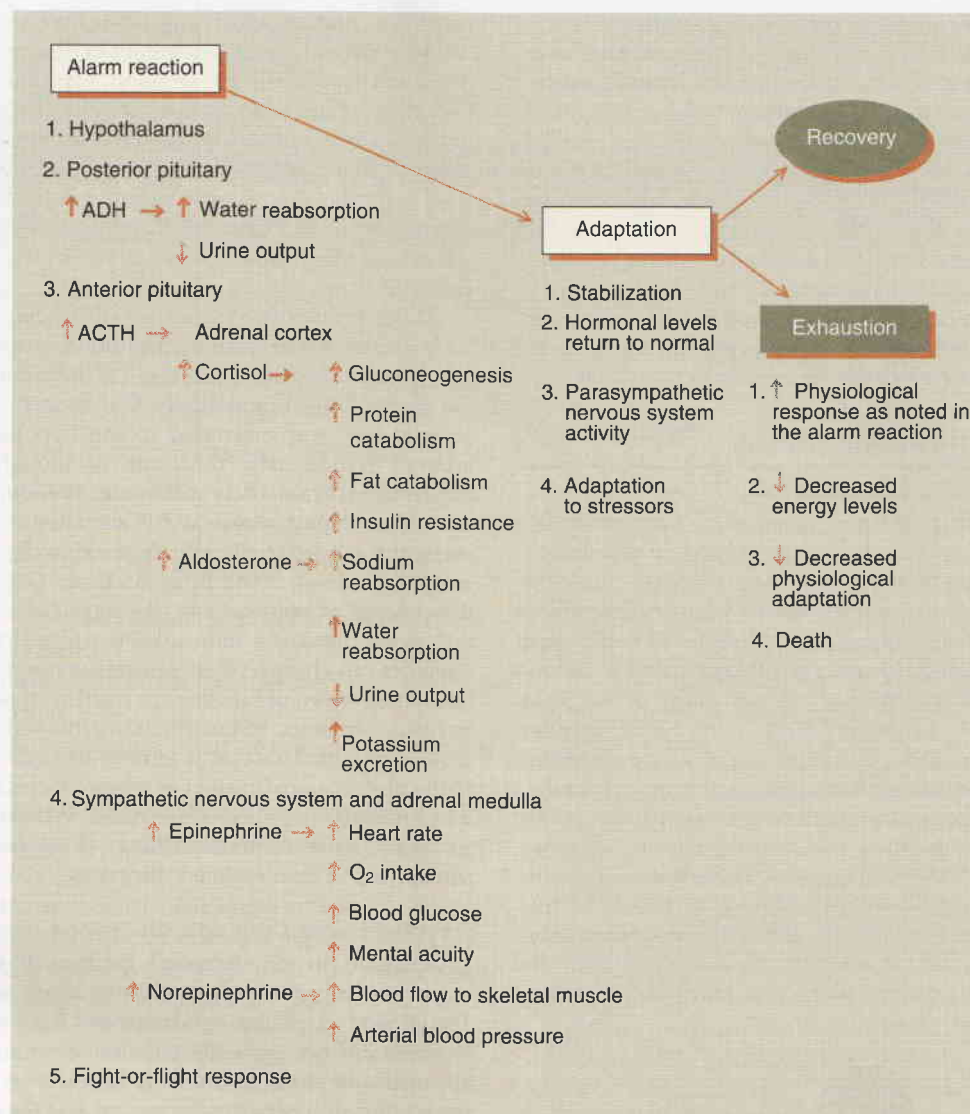


Figure 29-2 General adaptation syndrome. ACTH, Adrenocorticotrophic hormone; ADH, antidiuretic hormone.

relationship, or loss of work transportation through a motor vehicle crash. The frame of reference for a crisis is the viewpoint of the person experiencing the crisis. According to Aguilera's (1998) crisis theory, the vital questions for a person in crisis are "What does this mean to you?" and "How is it going to affect your life?" A basic assumption of crisis theory is that a person can either advance or regress as a result of a crisis, depending on how the crisis is managed. Feedback cues lead to ongoing reappraisals of original perceptions. Therefore, coping behaviours constantly change as new information is perceived.

Later work in the important role of appraisal and perception focused on the contribution of age and gender to responses to stressful events. Coping strategies, meaning attached to events, and responses to stressors change with age (Nosek et al., 2010). Gender differences may be conceptualized as an interaction between biologically based sex differences and an individual's social context (Desbonnet et al., 2008; Kimerling et al., 2000). Women and men may perceive a stressor differently, may attach different meanings to that stressor, and thus may have different responses and reactions (Davis et al., 1999;

Liu & Alloy, 2010). For example, Taylor (2006) has theorized that women more often show nurturing and support-seeking behaviours in response to stress, rather than fight-flight behaviours.

In summary, individual differences in response to stressors can be affected by previous vulnerabilities and experiences, coexisting health problems, age, gender, allostatic load, and coping resources. Psychological and biological conceptualizations are not mutually exclusive. Indeed, the integration of the various frameworks help explain the complexity of the relationship between stress and health.

Stress Response Systems

Sympathetic-Adrenal-Medullary System

Activation of the SAM system results in increased heart rate, diversion of blood from the intestines to the brain and skeletal muscles, increased blood pressure, bronchodilation and increased respiratory rate, and increases in blood glucose levels (Chrousos et al., 1988; Selye, 1991). All these changes are meant to prepare for fight-or-flight responses. A stressor

activates specific cells in the brain stem that release norepinephrine into the bloodstream. Norepinephrine stimulates the adrenal medulla to release epinephrine. Epinephrine produces the cardiovascular, respiratory, and metabolic changes and the heightened awareness or alertness. Chronic stimulation brings about a chronic arousal state, with sleep disturbance, edginess and irritability, gastrointestinal upset, and increased startle responses. Brain areas that are involved in this stress response system include the following:

- **Reticular formation:** This is a small, integrative cluster of neurons in the brain stem and spinal cord that continuously monitors the physiological status of the body through connections with sensory and motor tracts. For example, certain cells within the reticular formation can cause a sleeping person to regain consciousness or increase the level of consciousness when a need arises.
- **Limbic system:** This is another integrative cluster of neurons that interconnect several parts of the brain that is involved in processing strong emotional experiences. Fear and perceived threat will cause increased activity within this system.
- **Midbrain and pons:** The midbrain joins the lower part of the brain stem and the spinal cord with the higher part of the brain and acts as a reflex centre for certain auditory, visual, and postural stimuli. The pons mainly relays impulses to and from the medulla oblongata to other parts of the brain and the peripheral nervous system, and it also controls the rate and depth of breathing.
- **Medulla oblongata:** This brain region controls vital functions necessary for survival, including heart rate, blood pressure, and respiration. Impulses travelling to and from the medulla oblongata can increase or decrease these vital functions. For example, heart rate is regulated by sympathetic or parasympathetic nervous system impulses travelling from the medulla oblongata to the heart. The rate increases in response to pulses from sympathetic fibres and decreases with impulses from parasympathetic fibres.

Hypothalamic-Pituitary-Adrenal Axis

Activation of the HPA axis results in the release of a cascade of hormones (Dunn, 1989). A stressor activates the hypothalamus to release a corticotrophin-releasing hormone (CRH). This hormone activates receptors in the anterior pituitary, which signals the release of adrenocorticotrophic hormone (ACTH) into the bloodstream. ACTH interacts with its receptors in the adrenal cortex to release glucocorticoids. In humans, the major glucocorticoid is cortisol. Cortisol has effects similar to those of epinephrine, contributing to the increase in heart rate and blood pressure, causing shunting of blood to skeletal muscles, and increasing the availability of glucose in the bloodstream. This stress response system is tightly controlled by negative feedback, whereby rising cortisol levels activate receptors in the hypothalamus and the pituitary gland, shutting off further release of CRH and ACTH (Brunello et al., 2001). Other brain chemicals, such as β -endorphin (Kageyama et al., 2011), arginine vasopressin (Yayou et al., 2009), and oxytocin (Oliff et al., 2010) are also involved in the regulation of the HPA axis.

This part of the endocrine system interacts with other parts that regulate sex hormone levels, thyroid hormones, electrolyte and fluid balance, and insulin release. Therefore, overwhelming or chronic stressors can have diverse and complex impacts on health. The following brain areas are involved in this stress response system:

- **Hypothalamus:** This region of the brain is involved with many basic physiological processes, including appetite, sexual drive, sleeping, motor activity, and mood states (all of which are affected by stress). The hypothalamus is highly interconnected with many other areas of the brain. Dysregulation of the hypothalamus is thought to be involved in depression.
- **Pituitary gland:** This small gland, attached to the hypothalamus, produces and releases hormones that control vital functions. It is divided into the anterior and posterior portions. The anterior pituitary releases stress-, thyroid-, growth-, and reproduction-related hormones, whereas the posterior pituitary releases hormones related to electrolyte and water balance, as well as oxytocin. Both the pituitary gland and the hypothalamus can produce endorphins. **Endorphins** are hormones that produce a sense of well-being and reducing pain (Lazarus, 1999).
- **Adrenal glands:** One of these glands rests atop each kidney, and they are fundamental to stress responses. Each is composed of two very different regions. The outer region, or cortex, is where glucocorticoids such as cortisol are produced and released, and the inner region, or medulla, is where epinephrine is produced and released.

Stress and the Immune System

Physiological responses to stress also include immunological responses, although the mechanisms through which stress affects the immune system are not fully understood (Aldwin, 2000; Box 29-1). The immune system differentiates between self and non-self material, so that, under normal conditions, one's own cells are not treated as threats in the way that bacteria, viruses, parasites, or toxins are treated. An antigen on the surface of bacteria cells identifies them as invaders. After being exposed to a particular antigen, the immune system remembers how to respond to that antigen and is prepared to respond with antibodies when the same antigen appears at a later time. Autoimmune illnesses like multiple sclerosis, fibromyalgia, or insulin resistance can occur when the immune system misinterprets the body's own cells as foreign. Glucocorticoids are powerful anti-inflammatory agents and play a role in the

> BOX 29-1

Factors Influencing the Response to Stressors

Aspects of a Stressor That Influence the Stress Response

- Intensity
- Scope
- Duration
- Number and nature of other stressors
- Past exposure to serious stressors
- Predictability

Characteristics of the Individual That Influence the Stress Response

- Age
- Gender
- Perception of personal control or inescapability
- Availability of social supports
- Feelings of competence
- Cognitive appraisal

cascade of homeostatic immune responses that are activated by infection or inflammation and clinical depression. Dysregulation or chronic activation of the SAM system and the HPA axis may increase the risk of stress-related mental illnesses, as well as cardiovascular disease, insulin resistance (which in turn can increase risk for type 2 diabetes), metabolic syndromes, and autoimmune illnesses.

The Relationship Between Type of Stressor and Health

Selye (1974) identified two types of stress: **distress**, or damaging stress, and **eustress**, or stress that protects health. Eustress is motivating energy, such as happiness, hopefulness, and purposeful movement (Varcarolis, 2002). Eustress is a positive, healthy adaptation to stressors in daily life. In reference to this concept, Selye (1974) wrote the book *Stress Without Distress*. However, Aldwin (2000) wrote that the idea of healthy stress is controversial because it is difficult to tell whether a person has benefited from stress or is coping by denying the stress in some way.

Distressing events can be categorized in many ways, including work stressors, family stressors, chronic stressors, acute stressors, daily hassles, trauma, and crisis: “Work and family stress interact, family being the background for work stress, and work the background for family stress” (Lazarus, 1999). Women who have preschool children, for example, may experience full-time work as stressful when their child cannot go to day care because the child is ill and their husband’s job involves extended periods away from home. It is difficult to categorize some events, like the horrific devastation and loss of life experienced as a result of the March 2011 earthquake in Japan, and to predict what long-term health implications there will be for the Japanese population. Chronic stress can arise also from stressful roles, such as being a caregiver for a spouse with Alzheimer’s disease, or persistent physical or psychological conflict. Another example of chronic stress is living with a long-term illness. Conversely, acute stress is provoked by time-limited events that are threatening for a relatively brief period. In the context of chronic or acute stress, daily hassles, such as commuting to work, maintaining a home, social and personal interactions, and managing money, can become more difficult to manage. **Trauma** can refer to any physical damage to the body or in psychological terms can refer to feelings of fear, threat, and persistent reliving after witnessing or experiencing an emotionally painful, distressful, or shocking event(s). Severe stressors such as natural disasters or interpersonal events such as family violence or child maltreatment are often considered traumatic events; however, as in other types of stressors, perception plays a major role in the individual’s response to such events. Indeed, for some people, serious stressors can lead to positive change or personal growth, leading in turn to greater self-knowledge, improved coping skills, stronger social ties, and positive changes in values and perspectives (Hyer & Sohnle, 2001; Wendt et al., 2011). There is an emerging body of knowledge regarding positive change, called **post-traumatic growth** and defined as “positive psychological change experienced as a result of the struggle with highly challenging life circumstances” (Tedeschi & Calhoun, 2004).

Stress-Related Disorders

Prolonged exposure to a serious stressor or an acute stressor that overwhelms the ability to cope can lead to stress-related

* BOX 29-2 RESEARCH HIGHLIGHT

Understanding Risks for Developing Psychological Distress

Research Focus

When caring for patients who have experienced traumatic events such as motor vehicle crashes, assaults, and industrial accidents, nurses focus first on life-threatening effects of the trauma. However, other consequences of trauma, such as psychological distress, may not be immediately evident. You need to be aware of risk factors for anxiety, depression, acute stress disorder, and post-traumatic stress disorder after trauma and help your patient understand some common responses to such events, how many acute stress symptoms fade with time, and what symptoms should be reported to a health provider.



Research Abstract

The purpose of Joy et al.’s (2000) study was to describe pretrauma characteristics of people who experienced significant psychological distress shortly after physical injury. Individuals who had received treatment in the emergency department were contacted and asked to complete three questionnaires: the Post-traumatic Stress Disorder Scale, the Impact of Event Scale (IES), and the Hospital Anxiety and Depression Scale. A fourth questionnaire, the Abbreviated Injury Scale, was completed by the researchers on the basis of a medical record review. Significant psychological distress was documented in 152 people (87 women and 65 men) of all the people receiving emergency treatment. Overall, the people identified with distress reported very little functional impairment and a high level of contentment before the traumatic event. Most of their injuries were relatively minor and not life-threatening. However, 141 (93%) of the subjects showed evidence of post-traumatic stress disorder (PTSD). The IES revealed that the subjects were experiencing high levels of trauma-related distress. The researchers examined the relationship between pretrauma variables and the total score on the IES. The pretrauma factors of being unemployed and having experienced previous trauma were shown to be important contributors to the total IES score. The researchers concluded that (1) trauma perceived as mild by nurses and other health providers can nonetheless result in severe stress, anxiety, and depression for the patient; (2) high functioning before a traumatic event does not protect the patient from developing PTSD symptoms; and (3) pretrauma unemployment can contribute to psychological distress after a traumatic injury.

Evidence-Informed Practice

- Regardless of the severity of trauma or previous level of functioning, patients who have experienced a traumatic injury are at risk for developing PTSD.
- Nurses must monitor the patient’s perception of the meaning and impact of a traumatic injury, regardless of the apparent severity of the trauma.
- Two risk factors for developing PTSD after a traumatic injury are unemployment before the trauma and previous trauma.

Reference: Joy, D., Probert, R., Bisson J. I., & Shephard, J. P. (2000). Post-traumatic stress reactions after injury. *Journal of Trauma*, 48(3), 490–494.

disorders (Box 29-2). However, even if an individual’s stress-related symptoms do not meet full criteria for a stress disorder, it is important to recognize that those symptoms may have a significant impact on the individual’s functioning and their relationships with others. If interventions are not implemented, these symptoms can decrease quality of life and increase the

risk of developing the full disorder. Early emerging stress-related symptoms include poor sleep, tension and jitteriness, and inability to concentrate, to a degree that day-to-day activities are affected.

Although stress-related psychiatric disturbances are usually considered to be acute stress disorder and post-traumatic stress disorder (PTSD), these are only two potential health outcomes. It is important to recognize the diversity of health effects from serious stressors. Indeed, clinical depression, chronic pain syndromes, somatization disorder, and irritable bowel syndrome have all been linked to chronic stress (Blackburn-Munro & Blackburn-Munro, 2001; Matthews et al., 2001). Health providers need to perform thorough, multifaceted assessments to identify the full range of health effects.

Acute Stress Disorder. Acute stress disorder is limited to the month after experiencing, witnessing, or being confronted with a traumatic event; the reaction is one of intense fear, helplessness, or horror (American Psychiatric Association, 2000). Other criteria of acute stress disorder are as follows: (1) The patient displays at least three acute dissociative symptoms; (2) the patient has at least one recurring symptom (intense memories, **flashbacks** [recurring, intensely vivid mental images of a past traumatic experience], or distressing dreams); (3) the patient displays marked avoidance of stimuli that arouse memories of the trauma; (4) the patient shows marked hyperarousal; and (5) these symptoms emerge between two days and four weeks after the traumatic event (Hyer & Sohnle, 2001). These symptoms must have a significant effect on the individual's occupational, social, or personal functioning to meet full criteria for acute stress disorder. Examples of traumatic events that lead to acute stress disorder are motor vehicle crashes, natural disasters, violent personal assault, emergency service work experiences, and military combat. Nurses are also not immune to acute stress disorder. Treatment usually focuses on symptoms: to aid in sleeping and to relieve the jitteriness and irritability. If the trauma-related symptoms persist longer than one month, the individual will likely meet the criteria for post-traumatic stress disorder.

Post-Traumatic Stress Disorder (PTSD). Symptoms of **post-traumatic stress disorder (PTSD)** are more persistent, having endured for at least one month (American Psychiatric Association, 2000). The symptom clusters are similar to those of acute stress disorder, with less emphasis on dissociative symptoms (Breslau & Kessler, 2001). The diagnosis of PTSD was formulated from research with men returning from the Vietnam War and was first thought to be quite rare. Ongoing community-based studies showed it to be more prevalent, with lifetime prevalence rates of 6.8% (Brunello et al., 2001). Treatment guidelines for PTSD have been published and include multimodal interventions with drug therapy and targeted psychotherapy (Forbes et al., 2010).

Nursing Knowledge Base

Nurses have proposed theories related to stress and coping. Because stress plays a role in vulnerability to disease, symptoms of stress often necessitate nursing intervention.

Nursing Theory and the Role of Stress

Neuman's (1995) systems model is based on the concepts of stress and reaction to stress. Nurses are responsible for developing interventions to prevent or reduce stressors on the patient or to make them more bearable for the patient (Neuman,

1995). Because Neuman's model is a systems model, it is applied not only to understand patients' individual responses to stressors but also to understand families' and communities' responses. All systems experience multiple stressors, each of which has a differing potential to disturb the person's, family's, or community's dynamic balance. Every person has developed a set of responses to stress that constitute the "normal line of defence" (Neuman, 1995). This line of defence helps maintain health and wellness. However, when "physiological, psychological, sociocultural, developmental, or spiritual influences" are unable to buffer stress, the normal line of defence is broken, and disease can result. Neuman's systems model coincides with Selye's (1974) general adaptation syndrome and McEwan's (2007) concept of allostatic load.

Neuman's (1995) systems model stresses the importance of accuracy in assessment and interventions that promote optimal wellness through the use of primary, secondary, and tertiary prevention strategies. According to Neuman's theory, the goal of primary prevention is to promote patient wellness by stress prevention and reduction of risk factors. Secondary prevention occurs after symptoms appear. You help the patient determine the meaning of the illness and stress, and you find resources available to handle them. Tertiary prevention begins when the patient is becoming more stable and recovering. At the tertiary level of prevention, you support rehabilitation processes involved in healing, moving the patient back to wellness, and the primary level of disease prevention.

In their health promotion model, Pender and colleagues (2002) proposed that health promotion is directed toward increasing the level of well-being of an individual or group. Conversely, primary, secondary, and tertiary prevention (health protection) focus on avoiding negative events. Pender et al. considered stress reduction strategies important to reduce threats to well-being, to help people fulfill their potential, and to shape and maintain health behaviours. To change behaviour, the patient must initiate the change and behave differently in interactions. On the basis of core assumptions regarding the capability and desire of people to be healthy, Pender et al. suggested strategies for prevention and health promotion related to stress management.

Situational, Maturational, and Sociocultural Factors

Multiple factors affect the types of potential stressors and coping mechanisms. Age is one; for example, adolescence, adulthood, and old age bring different stressors (Andersen & Teicher, 2008). Appraisal of stressors, amount and type of social support, and coping strategies are other factors that affect appraisal of stressors, as are previous life experiences (Aguilera, 1998).

Situational Factors. Situational stress can arise from the person's current circumstances, such as moving, changing jobs (stressful job changes include promotions, transfers, downsizing, restructuring, and changes in supervisors and/or responsibilities), and adjusting to a chronic illness or condition. Common diseases and conditions that can be exacerbated by stress are obesity, hypertension, diabetes, depression, asthma, and coronary artery disease. Being a family caregiver may also cause situational stress, although the source of stress may be not necessarily the caregiving but other factors in the caregiver's life, such as work, finances, or lack of respite (Merluzzi et al., 2011). Spouses and other family members also experience stress when a loved one is ill (Box 29-3).

* BOX 29-3 RESEARCH HIGHLIGHT

Spousal Support for Psychological Distress

Research Focus

Holistic nursing care includes the patient's family. Family members, especially the spouse, influence the patient's recovery from cardiac disease and surgery. More information is needed about stress experienced by spouses of patients in cardiac rehabilitation and interventions to help spouses cope with stress.

Research Abstract

The purposes of Chung et al.'s (2010) study with patients with heart failure were (1) to examine differences between caregivers with or without depressive symptoms in patients' characteristics and caregiver functional status, caregiving burden, and perceived sense of control, and (2) to determine factors that predicted depressive symptoms of caregivers, controlling for gender and age. Patients and their primary caregivers were recruited from outpatient clinics. Both were asked to independently fill out questionnaires to assess presence of depression symptoms, functional status, caregiving burden, and perceived sense of control. Twenty-eight percent of caregivers who had depressive symptoms had poorer functional status, lower perceived control, and higher caregiving distress and spent more time with caregiving tasks than did caregivers with no depressive symptoms. The authors suggest that both the patient and their caregivers may benefit from interventions aimed at the caregivers' depressive symptoms.

Evidence-Informed Practice

- Spouses of patients with chronic heart problems could benefit from the following interventions:
- Stress-management techniques, such as relaxation training, assertiveness training, and self-care techniques
- Training in problem-solving and cognitive-based coping strategies that increase perceived sense of control and address caregiving burden distress
- Interventions for depressive symptoms

Reference: Chung, M. L., Pressler, S. J., Dunbar, S. B., Lennie, T. A., & Moser, D. K. (2010). Predictors of depressive symptoms in caregivers of patients with heart failure. *Journal of Cardiovascular Nursing*, 25(5), 411–419.



* BOX 29-4 FOCUS ON OLDER ADULTS

- Older adults are incorrectly presumed to be more vulnerable to the psychosocial effect of stressors (Kasl, 1992). However, the diurnal pattern of HPA axis activity does change with age with higher evening levels of cortisol (Magri et al., 2006). As a result, sleep patterns may be altered, memory may be impaired (Lupien et al., 2005), and immune system functioning may be blunted (Graham et al., 2006). These changes can lead to increasing physical and mental frailty (Butcher & Lord, 2004).
- A study of stress and coping in patients aged 75 to 91 years revealed that such patients, in comparison with patients of other ages, were less likely to view their lives as having problems, and they expended less effort in coping (Aldwin et al., 1996). This view may arise from multiple factors, including life experiences and perspectives of older adults that make most problems seem insignificant, having acquired appropriate stress management techniques and increased acceptance of daily hassles.
- The timing of stress-inducing events can significantly influence older adults' ability to cope. Many older adults experience several stressful events (e.g., loss of a spouse and new medical diagnosis) within a brief time frame, which may result in reduced coping ability.
- Older adults with strong spiritual beliefs effectively use religious coping in response to medical illness and disasters (Foster, 1997).
- Major depressive disorder and anxiety disorders are the most prevalent mental health disorders in later life (Chapman & Perry, 2008; Skultety & Rodriguez, 2008).



Sociocultural Factors. Low socioeconomic status is not necessarily associated with more stress than better financial status is. You must not make assumptions about the sources of stress for an individual or family. However, some circumstances create higher risk of experiencing serious stressors or trauma. For example, living under conditions of continuing violence, living in disintegrated neighbourhoods, and homelessness can be damaging, especially for young people (Pender et al., 2002).

A person's cultural background also greatly influences the perception of and reaction to stress (Aldwin, 2000). Cultural context must be integrated into any assessment. Differences are observed from culturally distinct groups within the general population, such as Aboriginal cultures, as well as from immigrant populations. It is important to recognize that Aboriginal culture is not singular. Indeed, potential stressors vary by geographic region (e.g., whether patients live in urban centres, rural areas, or remote parts of Canada); by historical events, such as residential schooling; and by the financial status of a specific Aboriginal group. Although stressors related to immigration have been well described, ongoing stressors also may influence the health of families for generations. Initial stressors can include career and financial issues related to underemployment, loss of extended family supports, language barriers, and unfamiliarity regarding accessing health services (Mollica et al., 2001; Shen & Takeuchi, 2001). Later stressors can be related to raising children in a dual context (between cultural norms of the country of origin and the current environment) (Beiser et al., 2010). An example of how cultural background may influence health is behavioural responses to pain (Box 29-5).

Maturational Factors. Stressors vary with life stage and are not necessarily related to negative events. Important individual and family developmental milestones can be anticipated with excitement but can nonetheless be stressful. Pre-adolescents may experience stress related to self-esteem issues, changes in family structure as a result of divorce or death of a parent, or hospitalizations. As adolescents search for their identity with peer groups and separate from their families, they may view these developmental tasks as stressors. In addition, they must make decisions about using mind-altering substances, peer pressure, sexuality, jobs, school, and career choices; the decision-making process may also be viewed as stressful. Stress for adults can arise from major changes in individual and family life circumstances (Aguilera, 1998). These changes include the many milestones of beginning a family and a career, losing parents, helping children leave home, and accepting physical aging. In old age, stressors include the loss of autonomy and mastery, as a result of general frailty or health problems that limit mobility, stamina, and strength, and the loss of spouse, close friends, and family that provided social support over the years (Box 29-4).

* BOX 29-5 CULTURAL ASPECTS OF CARE

Cultural context shapes the types of environmental stimuli that lead to activation of stress response systems. For example, diverse cultures address developmental transitions and life's turning points differently. How a person leaves the parental home, experiences health crises or chronic illness, cares for the family, or becomes disabled or dependent are all culturally bound. Furthermore, how a person appraises stress is also dependent on the person's culture. Coping strategies are also influenced by culture. According to Aldwin (1992), cultures vary in their emotion-focused and problem-focused coping strategies. According to some cultures, emotions should be controlled; according to others, they should be expressed. *Problem-focused coping* refers to controlling or managing stress. In addition, cultures provide different institutions for coping with stress. These include the legal system for conflict resolution, advice givers or support groups, and rituals.

Implications for Practice

- Realize that stressors and coping styles vary with different cultures.
- Use introspection to examine your own perceptions of stress and coping in a cultural context.
- Assess the influence of culture on a patient's appraisal of stress.
- Determine the available resources within a patient's culture that may facilitate coping.

Source: Aldwin, C. M. (2000). *Stress, coping and development: An integrative perspective* (pp. 30–22). New York: Guilford Press.



Critical Thinking

When caring for a patient who is experiencing stress, you integrate knowledge from nursing and other disciplines, previous experiences, and information gathered from patients to understand the particular stressor, its meaning for the patient and family, and current and past events that influence their responses to this stressor. You must know the neurophysiological changes that occur in response to overwhelming or chronic stress. You must also be able to determine the patient's perception of the situation and help the patient identify and use coping strategies that have helped in the past. If the patient's usual coping skills are unsuccessful or support systems are inadequate, you must implement crisis intervention counseling (see "Crisis Intervention").

You should be confident in the belief that you can help the patient manage the current situation effectively. Patients who are overwhelmed and perceive events as being beyond their capacity to cope rely on you as their guide to action. Through a nurse's expert advice and counsel, many patients gain confidence in their own ability to manage the consequences of the recent event. Standards of practice can help you make an accurate assessment of the level of a patient's stress, previously successful coping mechanisms, and available support systems before you intervene.

Nursing Process

❖ Assessment

When assessing a patient's stress level and coping resources, you must ask the patient to share personal and sensitive

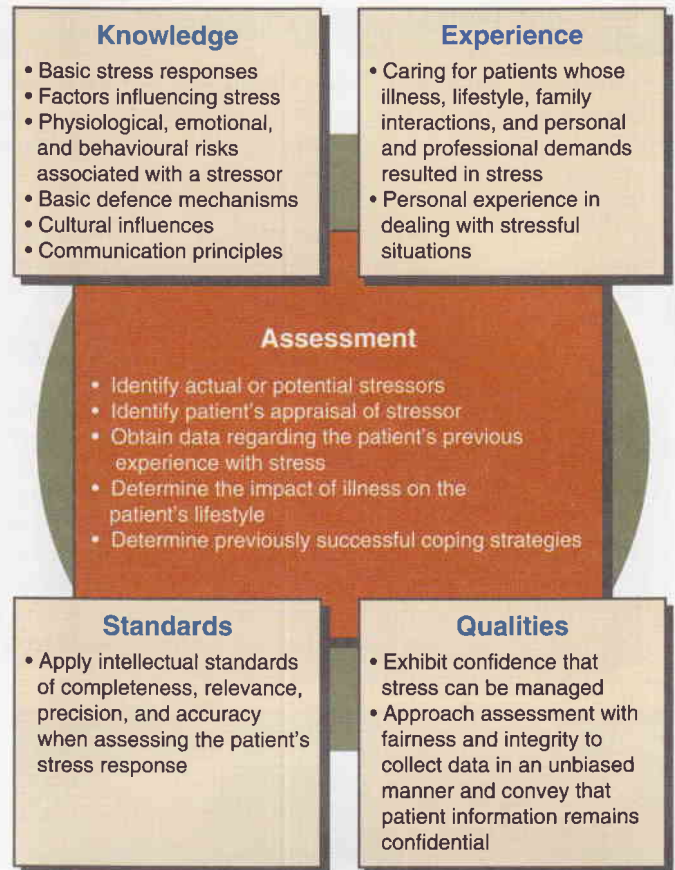


Figure 29-3 Critical thinking model for stress and coping assessment.

information. Therefore, you must first establish a trusting nurse–patient relationship. By asking open-ended questions, listening carefully, observing the patient's nonverbal behaviour, and observing the patient's environment, you learn about the patient's stress. You use critical thinking skills to synthesize and analyze information (Figure 29-3). Often patients have difficulty expressing what is troubling them until they have the opportunity to talk with someone who has time to listen.

Subjective Findings

When assessing a patient's level of stress and coping resources, you arrange a nonthreatening physical environment, without a desk as a barrier, for the interaction (Varcarolis, 2002). You assume the same height as the patient, arranging the interview environment so that eye contact can be comfortably maintained or avoided. By placing chairs at a 90-degree angle or side by side, you can reduce the intensity of the interaction (Varcarolis, 2002). You use the interview to determine the patient's view of the stress, past successful coping resources, any possible maladaptive coping, and adherence to prescribed medical recommendations, such as medication or diet (Monat & Lazarus, 1991; Table 29-1). If the patient is using denial as a coping mechanism, you must be alert to whether he or she is overlooking necessary information. Other patients may state that they feel overwhelmed and unable to cope, but with help, they can reduce their multiple interacting stressors to manageable pieces. As in all patient interactions, you must respect the confidentiality and sensitivity of the information shared.

► TABLE 29-1 Focused Assessment Interview

Factors to Assess	Questions and Approaches	Physical Assessment Strategies
Perception of stressor	Ask the patient what is of most concern at this time. Ask the patient about problems sleeping, eating, working, and concentrating. Ask whether the patient has had accidents in the home, in the car, or on the job. Ask about previous stressors that are influencing current appraisals.	Observe nonverbal behaviour and expressions of feelings that indicate anxiety, fear, anger, irritability, or tension.
Available coping resources	Ask the patient about current friendships and contacts with family members. Ask what the patient has done in the past to cope with similar problems or stress. Ask how the patient spends leisure time. Ask the patient to describe any specific stress management techniques.	Observe whether the patient is alone or with others. Observe grooming and hygiene. Observe the patient's communication skills. Determine whether the patient is able to ask for help. Observe developmental level and sociocultural circumstances.
Maladaptive coping used	Assess current and past patterns of use of tobacco, prescription or over-the-counter drugs, and caffeine.	Observe for effects of heavy use of tobacco, alcohol, illegal drugs, and caffeine.
Adherence to healthy practices	Ask whether the patient visits a physician or nurse practitioner regularly for checkups. Ask about nutritional habits, exercise, use of seat belts, helmets (if applicable), and safer sexual practices.	Monitor pulse, blood pressure, weight. Observe nonverbal behaviour.



Figure 29-4 Sharing a joke or laughing with patients can reduce stress and support a therapeutic relationship.

safety alert Medical conditions such as sleep apnea and thyroid dysfunction that are common in older adults can initially cause symptoms that mimic stress-related symptoms. For this reason, a thorough physical assessment of an older adult who appears stressed or anxious is necessary to rule out potentially serious medical disorders. In addition, in older adults, signs of stress and crisis must be differentiated from emerging dementia and also from acute confusion, a condition that can be life-threatening.

Objective Findings

You obtain further findings about stress and coping by observing the patient's appearance and nonverbal behaviour during the interview, including grooming and hygiene, handshake and gait, body language, speech quality, eye contact, and attitude. Before or at the end of the interview, depending on the patient's anxiety level, you take basic vital signs to assess for physiological signs of stress, such as elevated blood pressure, heart rate, or respiratory rate (Figure 29-4).

Patient Expectations

It is crucial that you understand the meaning the patient attaches to the precipitating event and how stress responses are affecting the patient's life. You must allow the patient time to express priorities for coping. For example, if a woman has just been told that a breast mass was identified on a routine mammogram, you must discern what the patient wants and needs most from you. Some patients identify an immediate need for information about biopsy or mastectomy; others need guidance and support on how to share the news with family members. In some cases, when nothing can be done to change or improve the situation, allowing the patient to use denial as a short-term coping mechanism can be helpful. However, once you understand patient expectations, you must not exclude important aspects of care simply because a patient does not identify them as needs.

❖Nursing Diagnosis

You cluster data that indicate a potential or actual stressor and the patient's response. Keeping in mind previous knowledge and experiences with patients under stress, you then make individualized nursing diagnoses (Box 29-6).

Nursing diagnoses for people experiencing stress generally focus on coping. Major defining characteristics of *ineffective coping* include verbalization of both an inability to cope and an inability to ask for help. You identify defining characteristics by asking patients what currently concerns them most and allowing them sufficient time to answer. You observe for nonverbal signs of anxiety, fear, anger, irritability, and tension. Other defining characteristics include the presence of life stressors, an inability to meet role expectations and basic needs, alteration in societal participation, self-destructive behaviour, change in usual communication patterns, high rate of accidents, excessive food intake, drinking, smoking, and sleep disturbances. Stress can result in multiple nursing diagnoses, such as the following:

- *Anxiety*
- *Caregiver role strain*
- *Chronic pain*

BOX 29-6 NURSING DIAGNOSTIC PROCESS

Assessment Activities	Defining Characteristics	Nursing Diagnosis
Ask patient about change in sleeping patterns.	Sleep disturbance; difficulty falling asleep at night or staying asleep Nightmares or disturbing dreams Sighing	Anxiety
Ask patient to complete a sleep diary for two weeks.	Excessive sleeping	
Observe patient's behaviour and response to questions during assessment.	Fatigue Inability to concentrate Inaccurate response to questions Inappropriate laughing or crying	
Observe patient's appearance.	Poor grooming Self-harm	
Ask patient about changes in eating patterns.	Weight gain or loss Lack of interest in food	

- *Post-traumatic stress disorder*
- *Powerlessness*

Crises differ from stressors in the degree of severity, although stressors and crises have many similarities. A patient who perceives a situation as stressful, who is unable to cope in ways that have worked before, and who has insufficient support is experiencing a crisis. A crisis can be devastating and requires you to help mobilize all resources available (Aguilera, 1998).

❖Planning

Goals and Outcomes

Desirable outcomes for people experiencing stress are (1) effective coping, (2) coping by their family, (3) emotional health of the caregiver, and (4) psychosocial adjustment to life changes (Moorhead et al., 2008). You may select interventions for stress and improved coping such as coping enhancement or crisis intervention, which are in the *Nursing Interventions Classification (NIC)* (Dochterman et al., 2008). In addition, you select individualized interventions after you consider the nursing diagnosis, the resources available to the patient, and the goals identified by the patient and nurse (Figure 29-5).

Nursing interventions may be designed within the framework of primary, secondary, and tertiary prevention. At the primary level of prevention, individuals and populations who may be at risk for stress are identified (Stuart & Wright, 1995). At the secondary level, nursing actions are directed at symptoms, such as decreasing the frequency or intensity of specific symptoms. At the tertiary level, nursing interventions assist the patient in readapting and might include relaxation training and time management training (Box 29-7). Another method of planning care involves using a concept map (Figure 29-6). You

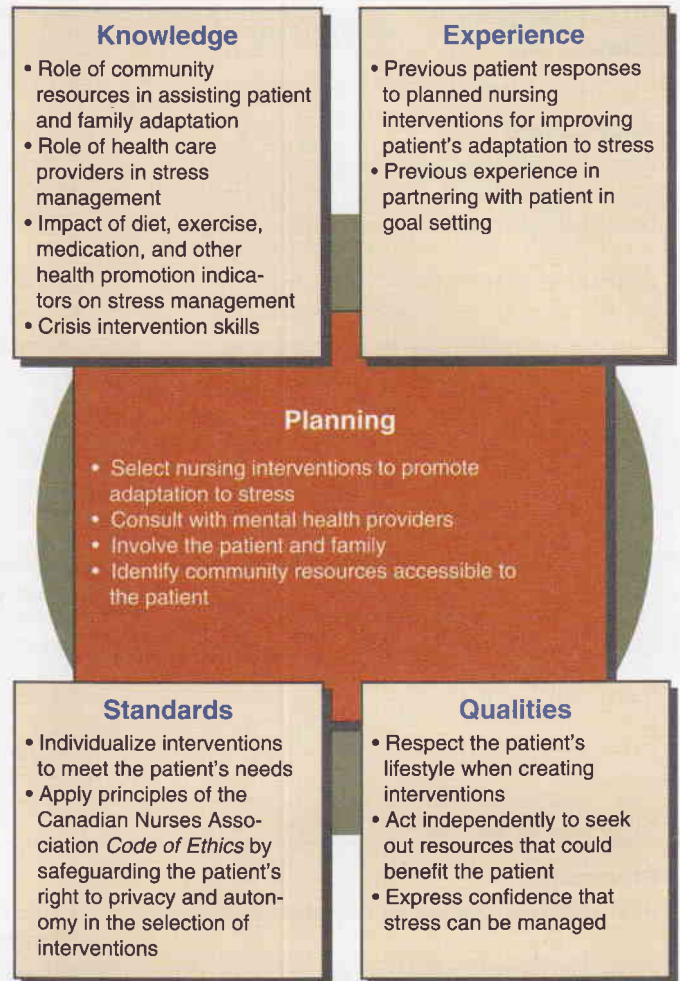


Figure 29-5 Critical thinking model for stress and coping planning.

create the map after identifying relevant nursing diagnoses from the assessment database. In this example, the nursing diagnoses are linked to the patient's medical diagnosis of PTSD. The concept map shows the relationships with the nursing diagnoses: PTSD, *ineffective coping*, *anxiety*, and *risk for other-directed violence*. In this approach, you use critical thinking skills to organize patient data and plan for patient-centred care.

Just as the nursing assessment of stress and coping depends on patient perception of the problem and coping resources, interventions focus on a partnership of the nurse with the patient and support system, usually the family. In the case of a family or community stressor and impaired family or community coping, the view of the situation and resources is broader.

Setting Priorities

When you prioritize needs for a person experiencing stress or a crisis, the first question to be answered is "What is happening in your life that you needed to come today?" or "What happened in your life that is *different*?" This question requires the patient to focus. You should then assess the patient's perception of the event, situational supports, and what the patient usually does when faced with a problem (Aguilera, 1998). As in all areas of nursing, safety of the patient and family is the first priority.

► BOX 29-7 NURSING CARE PLAN

Caregiver Role Strain

Assessment

When the professional nurse first goes to Carl's house, she finds the home to be in slight disarray. The lawn is overgrown, dirty dishes are in the sink, and an empty can of soup is sitting on the kitchen counter. Carl is standing in the living room, folding clothes from a laundry basket, and Evelyn, Carl's wife, is sitting in a chair watching TV. Evelyn recently received a diagnosis of Alzheimer's disease.

Assessment Activities

Ask Carl about his recent stressors and coping strategies.

Findings and Defining Characteristics

He continues to fold clothes during the visit, stating, "There's so much to do that I don't even know where to begin." Carl describes being awakened three to four times per night to find Evelyn wandering in the house.

He states that he has no outside activities and his children live in other provinces.

He does have several close friends who live nearby, but he does not know of community resources.

Observe Carl's grooming and hygiene.

Carl is unshaven and appears dishevelled.

Ask Carl about his sleep and nutrition patterns.

Carl states that he has lost 9 kg in the past 6 months and that his appetite has been poor.

Assess Carl's mood and affect by asking how he is feeling.

Carl states, "I feel very tired. Everything feels overwhelming."

Assess Carl's suicide potential.

Carl denies being suicidal.

Assess health status and health care status.

Carl has not seen a nurse practitioner or physician for his own health in over a year.

Nursing Diagnosis: Caregiver role strain related to recent diagnosis of wife's Alzheimer's disease

Planning

Goal (Nursing Outcomes Classification)*

Patient will appear rested in 1 month.

Expected Outcomes

Caregiver's Physical Health

Patient will report waking up less frequently during the night within 1 week.
Patient will verbalize approaches used to involve other people in caregiving activities within 2 weeks.

Patient will maintain a stable weight over next 4 weeks.

Patient will re-establish normal eating pattern within 1 week.
Patient will report improved appetite.

Patient will state that he has resumed one outside activity within 1 month.

Caregiver's Lifestyle Disruption

Patient will report within 1 week a balanced routine that incorporates time for own rest or relaxation.

*Outcome classification labels from Moorhead, S., Johnson, M., & Maas, M. L. (Eds.). (2008). *Nursing outcomes classification (NOC)* (4th ed.). St Louis, MO: Mosby.

Interventions (Nursing Interventions Classification)[†]

Caregiver Support

Assist patient in establishing a consistent care routine.

Rationale

Routines can help tasks be simplified and more time efficient.

Discuss ways that patient agrees will simplify care routine, such as hiring a teenage neighbour to mow the lawn, buying frozen meals, having groceries delivered, and having a cleaning service twice a month.

Caregivers experience stress outside of their caregiving roles. Frequently, providing ways to assist the caregiver with home maintenance, meal planning, and shopping assists caregivers with stress management.

Identify sources of respite care by encouraging patient to identify available friends who can assist with caregiving.

Caregiving cannot normally be successful if it involves only one caregiver. Caregiver may be hesitant to ask for help because of past family conflict (Etters et al., 2008).

Explore community resources such as home care, adult day care, and Meals on Wheels with patient.

Feelings of burden have been found to be lower among caregivers with social supports (Solomon & Draine, 1995).

Teach patient stress-management techniques.

Stress, especially long-term stress, can precipitate physical illness.

BOX 29-7 NURSING CARE PLAN—cont'd

Interventions (Nursing Interventions Classification)[†]

Caregiver Support

Set up monthly health checks for patient that include vital sign and weight measurements.

Teaching the caregiver health maintenance strategies is important for sustaining his own physical and mental health (Dochterman & Bulechek, 2004).

[†]Intervention classification labels from Dochterman, J. M., Bulechek, G. M., & Butcher, H.K. (Eds.). (2008). *Nursing interventions classification (NIC)* (5th ed.). St Louis, MO: Mosby.

Evaluation

Nursing Actions

Observe for signs of fatigue.

Patient Response and Finding

Carl states he feels more rested and less depressed.

Achievement of Outcome

Carl is able to sleep for 6 hours during night and takes a 30-minute nap in the afternoon.

Review new care routines. Ask patient what other modifications may need to be made.

Carl buys frozen meals to use when he is busy with other caregiving responsibilities.

Carl has reduced his personal expectation that he must cook every meal himself.

Ask patient about how community and additional family support is helping to relieve stress.

Meals on Wheels delivers lunch 5 days per week. A neighbour mows the lawn for Carl.

Carl is mobilizing community resources.

Ask patient to compare past and current energy levels.

Carl reports having more energy and smiles spontaneously.

Carl has improved balance between Evelyn's and his own routines.

Weigh patient regularly.

Carl reports gaining 2 kg in 1 month.

Carl has resumed a normal eating pattern.

Ask patient about recent food intake.

Carl reports having eaten lunch with Evelyn on the day of the visit.

Carl has been able to sustain reasonable food intake recently.

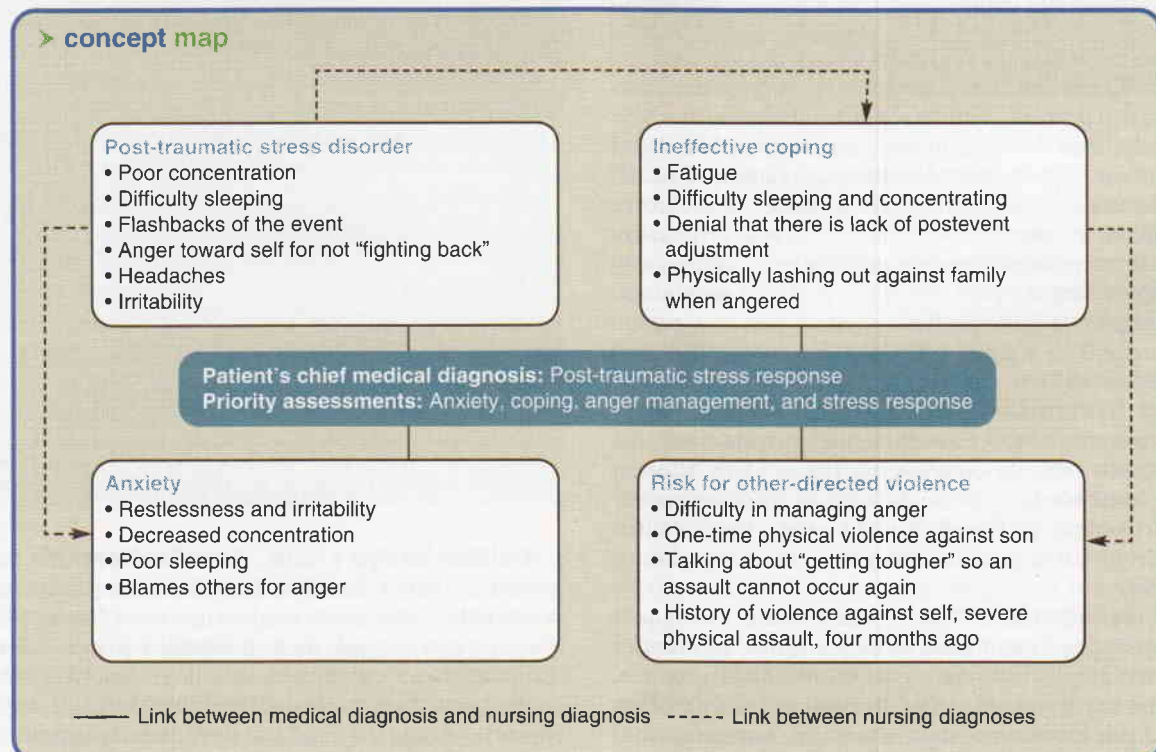


Figure 29-6 Concept map for patient with PTSD after experiencing a severe physical assault four months ago.

safety alert Direct questions help to determine whether the person is suicidal or homicidal. You might ask, "Have you thought that life is not worth living? Are those thoughts with you most of the day?" "Have you thought your problems would be solved if that other person were not around anymore?" If so, you should calmly determine whether the patient has a plan and determine how lethal the means are. If suicide or homicide is not an issue, you should consider other threats to the safety of people who are under the patient's care and provide for their temporary care or supervision if necessary. When immediate assessment is completed and safety is ensured, the problem-solving process should begin (Aguilera, 1998).

Continuity of Care

Sometimes the scope of nursing practice is insufficient to meet all of the patient's needs. For patients experiencing stress from medical conditions or psychiatric disorders, you must consult with advanced practice mental health nurses, psychiatrists, psychologists, psychiatric social workers, or other mental health experts. Such a multidisciplinary approach to care is often most effective in addressing the holistic needs of the patient and should be included in the planning of care. Your role is to recognize the need for collaboration and consultation, inform the patient about potential resources, and make arrangements for interventions, such as consultations, group sessions, or therapy as needed.

Implementation

Health Promotion

Three primary modes of intervention for stress are to decrease stress-producing situations, increase resistance to stress, and learn skills that reduce physiological and psychological responses to stress (Pender et al., 2002). You are in a position to educate patients and families about the importance of health promotion (Boxes 29-8 and 29-9). Several strategies help increase resistance to stress and reduce response to stress.

Regular Exercise. A regular exercise program improves muscle tone and posture, controls weight, reduces tension, and promotes relaxation. In addition, exercise improves mood and immune and cardiopulmonary functioning (Hume et al., 2011; Walsh et al., 2011). Patients who have a history of a chronic illness, who are at risk for developing an illness, or who are older than 35 years should begin a physical exercise program only after discussing the plan with a physician. In general, for a fitness program to have positive physical effects, a person should exercise 3 to 4 times per week for at least 20 to 30 minutes (Figure 29-7).

Support Systems. A support system of family, friends, and colleagues who listen, offer advice, and provide emotional support benefits patients experiencing stress. Many support groups are available to individuals, such as those sponsored by the Heart and Stroke Foundation of Canada, the Canadian Cancer Society, local hospitals and churches, and mental health organizations.

Time Management. Time management techniques include developing lists of tasks to be performed in order of priority: for example, tasks that require immediate attention, those that are important but can be delayed, and those that are routine and can be accomplished when time becomes available. In many cases, setting priorities helps individuals identify tasks that are not necessary or perhaps can even be delegated to someone else.

* BOX 29-8

FOCUS ON PRIMARY HEALTH CARE

Nurses address their patient's stress or potential stress in many different primary health care settings. In a community setting, you might instruct a group of teenage mothers on how to care for their newborns and themselves. The goal of the instruction is to improve the health and safety of the babies and to prevent stress, health breakdown, and crises in the lives of vulnerable mothers. In a home setting, you might help the family of a patient who has cancer to recognize and deal with symptoms of stress in their lives. In an interview at a community clinic, you might assess the stress in the life of a patient with sleep problems and plan interventions to help the patient sleep. Nurse practitioners who work in primary health care settings can provide a range of services related to family health and ongoing management of chronic health problems.



* BOX 29-9

PATIENT TEACHING

Stress Management Strategies

Objective

- Improved coping with daily hassles in the workplace (such as depending on others for transportation to work, chronically late co-worker, multiple competing work demands, intense work demands at specific times)



Teaching Strategies

- Teach the patient how to break down hassles into specific aspects in order to begin coping with them.
- Instruct the patient to avoid impulsive changes in lifestyle when stressed.
- Instruct the patient in time management skills to become more organized and set priorities.
- Assist the patient in examining lifestyle issues that may serve as stress relievers, such as walking during the lunch hour and other recreational activities.
- Assist the patient in examining dietary sources of increased tension, such as excessive caffeine intake (e.g., coffee, tea, chocolate).
- Assist the patient in building a network of social support.
- Train the patient in progressive muscle relaxation or other relaxation techniques.

Evaluation

- Observe the patient for signs of active coping strategies.
- Ask the patient to keep a record of hours of sleep.
- Ask the patient to list activities that are soothing or enjoyable.

Data from Pender, N. J., Murdaugh, C., & Parsons, M. A. (2002). *Health promotion in nursing practice* (4th ed.). Upper Saddle River, NJ: Haworth Press.

Guided Imagery and Visualization. The concept of guided imagery is based on the belief that a person can significantly reduce stress with imagination (see Chapter 34). Guided imagery is a relaxed state in which a person actively uses imagination to visualize a soothing, peaceful setting. The image created or suggested typically evokes many sensory words to engage the mind and offer distraction and relaxation.

Progressive Muscle Relaxation. In the presence of anxiety-provoking thoughts and events, a common physiological symptom is muscle tension. Physiological tension is

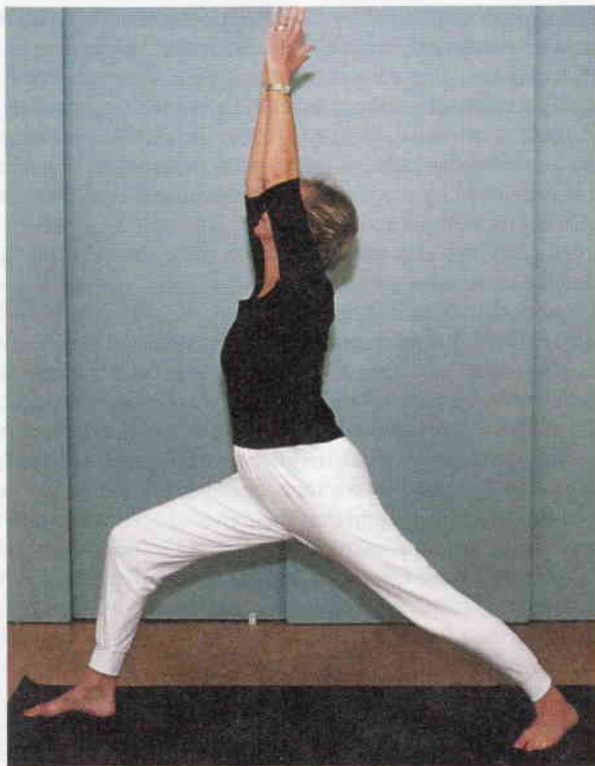


Figure 29-7 Regular exercise assists in coping with stress.

diminished through a systematic approach to releasing tension in major muscle groups. A relaxed state is achieved typically through deep chest breathing, and then the patient is directed to alternately tighten and relax muscles in specific groupings (see Chapter 34).

Assertiveness Training. Assertiveness comprises skills that help individuals communicate their needs and desires effectively. The ability to resolve conflict through assertiveness training is important for reducing stress. When assertiveness is taught in a group setting, benefits of the experience are increased.

Journal Writing. For many people, keeping a private, personal journal provides a therapeutic outlet for stress, and it is well within the realm of nursing to suggest journal keeping to patients experiencing difficult situations. In a private journal, patients can express a full range of emotion and vent their feelings honestly without hurting anyone's feelings and without concern for how they might appear to others. The writings can help individuals become more self-reflective, to increase their awareness of sources of stress, and to see how effective their coping strategies have been. Journal entries can also be shared with health care providers to help plan targeted interventions.

Stress Management in Your Workplace. Rapid changes in health care technology, diversity in the workforce, organizational restructuring, and changing work systems can place stress on nurses (Bauman et al., 2001; Manning et al., 1999). Additional causes of job stress include particular job assignments (Box 29-10), difficult schedules that include more than two different work shifts in short periods of time, working predominantly night shifts, fear of failure, and inadequate support services (Manning et al., 1999). **Burnout** occurs as a result of chronic stress. Burnout is "a syndrome of emotional

BOX 29-10 NURSING STORY

Missing What Is Important

I was so keen! I wanted to be such a good nurse. Thus, in the second year of my nursing program, I began my first day on an assessment unit within our provincial psychiatric hospital with eager anticipation of testing my newly learned communication techniques, mixed with some curiosity and admitted anxiety about how I would react to patients. As it turned out, what I was stressed about was so far off the mark! I was so concerned about how I would react to patients that I did not consider how patients would react to me! We were to complete verbatim reports regarding our interactions with our patients. However, my assigned patient was a middle-aged man with paranoid schizophrenia who apparently was suspicious of new people. It was suggested that I "hang around" the unit for a few days, so that my patient could get used to seeing me before I actually approached him. But what about those verbatim reports? How could I initiate the first conversation? Maybe discreet observations could fill in for the time being. I was caught up in my role as an unobtrusive staff member. On the second day, the patient abruptly approached me and in an angry tone stated, "You have been following me and watching me for two days!" So much for my discretion. In focusing only on my perceptions and needs, I had thought little about how perception, like communication, can be different for the participants. My spontaneous response was "You're right, I have. I just didn't know how to approach you." His anger dissolved into a laugh at my awkwardness. That clear, honest response was the start of a very rewarding nurse-patient relationship that spanned the entire two-month rotation. He taught me so much about mental health nursing: how perceptions about potential stressors affected our interactions, how spontaneity could be powerful in interactions, and how my self-perceptions needed to be checked against the perceptions of my patients, regardless of diagnosis. I subsequently enjoyed mental health as a career choice, which spanned more than 30 years. I worked with many different clinical populations over the years, but I still remember my stress and distress over my first patient and how it made me blind to what was really going on.

exhaustion, depersonalization of others, and perceptions of reduced personal accomplishment, resulting from intense involvement with people in a caregiving environment" (Cuneo et al., 2011; Gibbons 2010). This can be reflected in high rates of sick leave, irritability with co-workers, increased risk of errors at work, and increased home stress. Nurses are not immune to maladaptive coping, such as use of alcohol, in response to chronic stress or burnout.

Primary prevention is essential to addressing risk for burnout and is important for all health providers. Personal stress management strategies need to be a part of professional practice; they can include working on crafts, scheduled social outings with friends, participation in a team sport or an individual recreational or physical activity, limiting amount of overtime worked, taking an art class, or simply reading for pleasure. If nurses recognize feelings of burnout, they can engage in some of the same strategies that help patients: increase their own self-reflections regarding potential sources of stress, use daily journal writing to increase recognition of contextual factors, seek a colleague or mentor to help with their reflections, create an inventory of available personal and support resources, and devise a plan for addressing the various stressors in a manageable and positive manner. An important step is identifying the limits and scope of responsibilities at

work (Cuneo et al., 2011; Gibbons 2010). It is essential that you recognize the areas over which you have control and can change and those for which you do not have responsibility.

Acute Care

Crisis Intervention. When stress overwhelms a person's usual coping mechanisms and all available resources must be mobilized, the situation becomes a crisis. A crisis creates a turning point in a person's life because it changes the direction of a person's life in some way. According to Aguilera (1998), the precipitating event usually occurs one to two weeks before the individual seeks help, but it may have occurred within the past 24 hours. In general, a crisis is resolved in some way within approximately six weeks. The aim of crisis intervention is to return the person to a precrisis level of functioning and to promote growth (Figure 29-8). The use of unfamiliar strategies can result either in a heightened awareness of previously unrecognized strengths and resources or in deterioration in functioning. Thus, a crisis is often referred to as a situation of both danger and opportunity. Some people or families

emerge from a crisis state functioning more effectively, whereas others are weakened, and still others are rendered completely dysfunctional.

Crisis intervention is a specific type of brief psychotherapy with prescribed steps (Rose et al., 2003). Crisis intervention is more directive than traditional psychotherapy or counselling and can be used by any member of the health care team who has been trained in its techniques. The basic approach is problem solving, and the focus is on only the problem presented by the crisis.

When using a crisis intervention approach, you help the patient make the mental connection between the stressful event and the patient's reaction to it. This is crucial because the patient may be unable to envision the whole situation clearly. You also help the patient become aware of current feelings, such as anger, grief, or guilt, in order to reduce tension. In addition, you help the patient explore coping mechanisms, perhaps identifying ways of coping that the patient had not thought of. Finally, you may help increase the patient's social contacts if the patient has been internally focused and isolated.

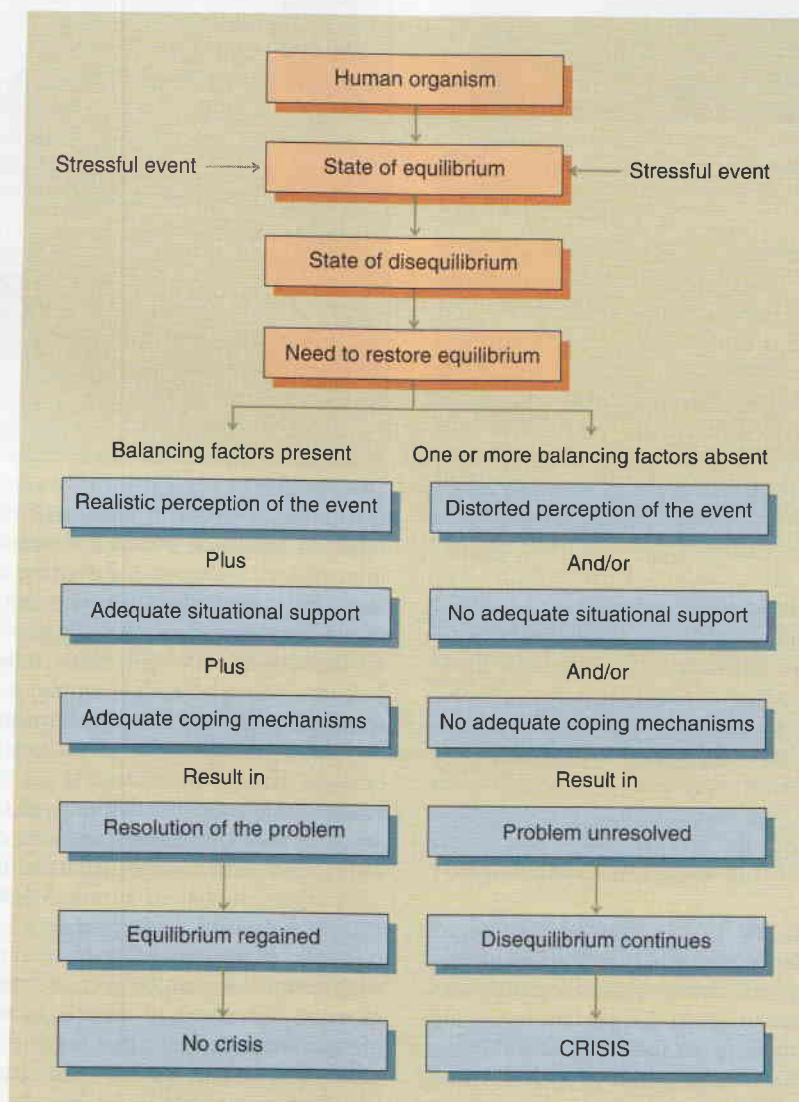


Figure 29-8 Crisis intervention model. **Source:** Redrawn from Aguilera, D. C. (1998). *Crisis intervention: Theory and methodology* (8th ed.). St Louis, MO: Mosby.

Restorative and Continuing Care

A person under stress recovers when the stress is removed or coping strategies are successful; however, a person who has experienced a crisis has changed, and the effects may last for years or for the rest of the person's life (Walsh et al., 2011). The final stage of adapting to a crisis is acknowledgement of the long-term implications of the crisis.

❖ Evaluation

Patient Care

By evaluating the goals and expected outcomes of care, you know whether the nursing interventions were effective and whether the patient is coping with the identified stress. You review the measurable goals and assess whether the patient has met the criteria for success as stated in the outcomes. If the nursing interventions have not been effective in helping the patient achieve targeted goals, you must re-evaluate the strategies implemented and revise the care plan in light of the patient's current health status (Figure 29-9).

To evaluate whether goals and outcomes of care have been achieved, you observe patient behaviours and interactions between the patient and family, if appropriate. If your contact with a patient ends before goals have been achieved, the patient should be referred to appropriate resources so that progress is not delayed or interrupted.

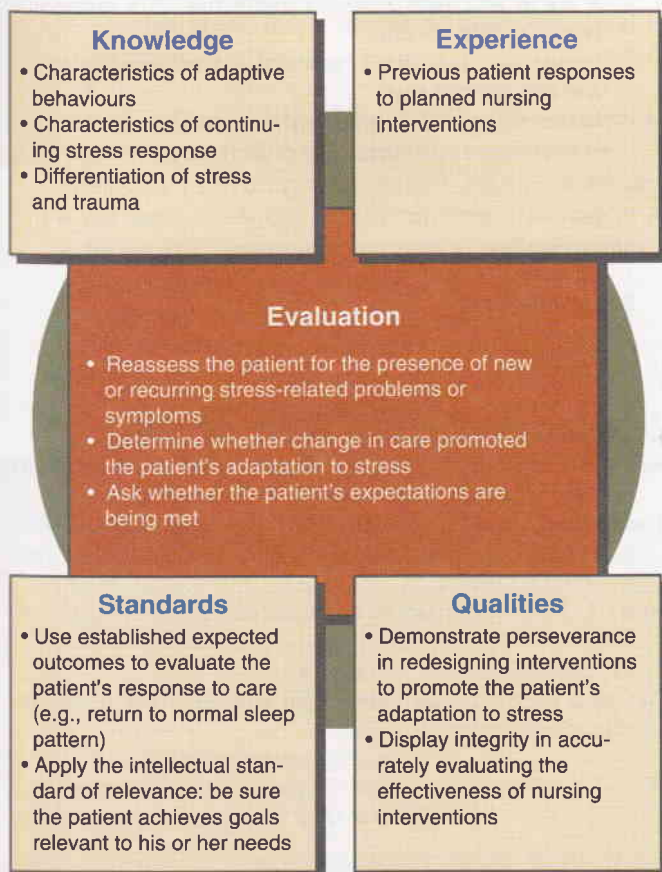


Figure 29-9 Critical thinking model for stress and coping evaluation.

Patient Expectations

It is crucial to maintain ongoing communication with patients in regard to the care plan. Patients under severe stress or trauma often feel powerless and vulnerable. You can help reduce these feelings by actively involving patients and families in assessment, prioritizing, goal setting, and evaluation. Being involved enables patients to direct their energy positively and encourages them to take responsibility for their health. It also facilitates open communication, which makes it easier for the patient to report on interventions that are successful and helps you better understand why some interventions fail to meet their goals.

❖ KEY CONCEPTS

- Physiological and psychological frameworks have been developed to describe how stress affects biological systems and psychological well-being.
- Overwhelming or chronic stress can increase the risks of (1) serious and long-standing physical and mental health problems; (2) choosing coping strategies that are unhealthy, such as isolating oneself, not getting enough rest or a proper diet, or using tobacco, alcohol, or caffeine; (3) ignoring warning signs of illness; and (4) neglecting to take prescribed medicines or treatments.
- A person is under psychological stress only if the person evaluates the event or circumstance as personally significant. Such an evaluation of an event for its personal meaning is called *primary appraisal*.
- Several types of stressors are work stressors, family stressors, chronic stressors, acute stressors, daily hassles, traumatic events, and crisis.
- Rapid changes in health care technology, diversity in the workforce, organizational redesign, and changing work systems can place nurses at risk for stress-related symptoms and burnout.
- Potential stressors and coping mechanisms vary across the lifespan: from childhood through adolescence, adulthood, and old age.
- Coping is a means of managing psychological stress and reflects a dynamic process in response to the current situation, past experiences, and available resources.
- Three primary modes for stress intervention are to decrease stress-producing situations, increase resistance to stress, and learn skills that reduce physiological response to stress.
- If stress is so severe that the patient is unable to cope in any ways that have worked before, the patient is experiencing a crisis.
- A crisis is a turning point in life and can be developmental or situational.
- In general, a crisis is resolved in some way within approximately six weeks. Crisis intervention aims to return the person to a pre-crisis level of functioning and to promote growth.

❖ CRITICAL THINKING EXERCISES

1. You are caring for a 30-year-old woman who has recently had surgery as a first step in her treatment for metastatic breast cancer. She is the lone parent and sole provider for three young children (all younger than seven years). Discuss the various stressors that must be considered when you write an appropriate discharge plan.
2. A patient comes to the emergency department with a complaint of dizziness, which is not related to any physical finding on examination. During the health history, the patient reports

that her life is very stressful and she is barely coping. She finalized her divorce three months ago, is working 32 hours per week, and is attending college. Her ex-husband recently lost his job and can no longer pay child support. She tearfully confesses that she thinks she might be pregnant but does not want her ex-husband to know. Develop nursing diagnoses related to this situation.

3. An older woman is admitted to the hospital with a fractured hip. Before her injury, she lived with her husband, who has advancing Alzheimer's disease. While she is hospitalized, he is staying with a niece who lives 50 km away, but this cannot be a permanent situation because her niece is also in frail health. The patient has no children who can help her when she returns home. She is concerned not only about who will care for her after she is discharged but also about her husband's care. What approach would be the best to take in establishing goals for treatment?

✦ REVIEW QUESTIONS

1. The vital functions necessary for survival, which include heart rate, blood pressure, and respiration, are controlled by the
 1. Medulla oblongata
 2. Reticular formation
 3. Pituitary gland
 4. Limbic system
2. While assessing a person for effects of the general adaptation syndrome, you should be aware that
 1. Heart rate increases in the adaptation state
 2. Blood volume increases in the exhaustion stage
 3. Vital signs return to normal in the exhaustion stage
 4. Blood glucose level increases during the alarm reaction stage
3. When performing an assessment of a young woman who was in an automobile accident six months before, you learn that the woman has vivid images of the crash whenever she hears a loud, sudden noise. You recognize that these reactions are flashbacks, which are symptoms of
 1. Social phobia
 2. Acute anxiety
 3. Post-traumatic stress disorder
 4. Borderline personality disorder
4. A man is adjusting to a chronic illness; the chronic illness can be considered
 1. A sociocultural stressor
 2. A maturational stressor
 3. A situational stressor
 4. An environmental stressor
5. A child who has been in a house fire comes to the emergency department with her parents. The child and parents are upset and tearful. During your first assessment for stress, what should you say?
 1. "Tell me whom I can call to help you."
 2. "Tell me what upsets you the most about this experience."
 3. "I will contact someone who can help get you temporary housing."
 4. "I will sit with you until other family members can come help you get settled."
6. You are evaluating the coping strategies of a patient experiencing stress from receiving a new diagnosis of multiple sclerosis and psychomotor impairment. You realized that the patient is coping successfully when the patient makes which of the following statements?
 1. "I am going to learn to drive a car so I can be more independent."
 2. "My sister says she feels better when she goes shopping, so I will go shopping."
 3. "I have always felt better when I go for a long walk. I will do that when I get home."
 4. "I am going to attend a support group to learn more about multiple sclerosis and what I will be able to do."
7. You know that the patient is recovering from the stress of an emergency surgery when the patient makes which of the following statements?
 1. "I am going to change jobs."
 2. "I am learning progressive relaxation training."
 3. "I plan to have plastic surgery while I am here in the hospital."
 4. "I am planning to sell my house and move within the next six weeks."
8. A staff nurse is talking with her nursing supervisor about the stress she feels from having transferred to a new inpatient unit. The supervising nurse recognizes that
 1. Nurses who feel stress usually pass the stress along to their patients
 2. A nurse who feels stress is ineffective as a nurse and should not be working
 3. Nurses who talk about feeling stress are unprofessional and should calm down
 4. Nurses frequently experience stress with the rapid changes in health care technology and organizational restructuring
9. In general, a person's crisis is resolved in some way within approximately
 1. six weeks
 2. one month
 3. six months
 4. two weeks

✦ RECOMMENDED WEB SITES

Health Canada: Mental Health-Coping With Stress: <http://www.hc-sc.gc.ca/hl-vs/iyh-vsv/life-vie/stress-eng.php>

This Web page provides links to taking care of your mental health by identifying symptoms of stress and strategies to decrease its effect on health.

Heart & Stroke Foundation Reduce Your Stress: http://www.heartandstroke.on.ca/site/c.pv13leNWJwE/b.3581755/k.D3BC/Reduce_your_stress.htm

This Web page provides information and resources related to coping with stress.

Review Question Answers

1. 1, 2, 4, 3, 3, 4, 3, 5, 2, 6, 4, 7, 2, 8, 4, 9, 1

Rationales for the Review Questions appear at the end of the book.

Sample

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Vital Signs

Written by Shelley Jeske, RN, MN

objectives

Mastery of content in this chapter will enable you to:

- Define the key terms listed.
- Explain the principles and mechanisms of thermoregulation.
- Describe nursing measures that promote heat loss and heat conservation.
- Discuss physiological changes associated with fever.
- Accurately assess temperature via multiple routes: tympanic, oral, temporal, rectal, and axillary.
- Accurately assess pulse, respirations, oxygen saturation, and blood pressure.
- Explain the physiology of normal regulation of blood pressure, pulse, oxygen saturation, and respirations.
- Describe factors that cause variations in body temperature, pulse, oxygen saturation, respirations, and blood pressure.
- Describe ethnic variations in blood pressure.
- Identify ranges of acceptable vital sign values for an infant, a child, and an adult.
- Explain variations in technique used to assess an infant's, a child's, and an adult's vital signs.
- Describe the benefits and precautions involving self-measurement of blood pressure.
- Identify when vital signs should be measured.
- Accurately record and report vital sign measurements.
- Appropriately delegate vital sign measurement to unregulated care providers.

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- Animations
- Audio Chapter Summaries
- Examination Review Questions
- Glossary
- Skills Performance Checklists
- Student Learning Activities
- Video Clips
- Weblinks

media resources

key terms

- Afebrile, p. 594
- Antipyretics, p. 505
- Auscultatory gap, p. 530
- Basal metabolic rate (BMR), p. 491
- Blood pressure, p. 521
- Bradycardia, p. 512
- Cardiac output, p. 506
- Celsius, p. 501
- Conduction, p. 492
- Convection, p. 492
- Core temperature, p. 491
- Diaphoresis, p. 492
- Diastolic, p. 521
- Diffusion, p. 513
- Dysrhythmia, p. 513
- Eupnea, p. 513
- Evaporation, p. 492
- Febrile, p. 494
- Fever, p. 493
- Fever of unknown origin, p. 494
- Frostbite, p. 494
- Heat exhaustion, p. 494
- Heatstroke, p. 494
- Hematocrit, p. 521
- Hypertension, p. 522
- Hyperthermia, p. 494
- Hypotension, p. 523
- Hypothalamus, p. 491
- Hypothermia, p. 494
- Hypoxemia, p. 513
- Malignant hyperthermia, p. 494
- Masked hypertension, p. 523
- Nonshivering thermogenesis, p. 491
- Orthostatic hypotension, p. 523
- Perfusion, p. 513
- Postural hypotension, p. 523
- Pulse deficit, p. 512
- Pulse pressure, p. 521
- Pyrexia, p. 493
- Pyrogens, p. 493
- Radial pulse, p. 506
- Radiation, p. 492
- Shivering, p. 491
- Sphygmomanometer, p. 524
- Stroke volume, p. 506
- Systolic, p. 521
- Tachycardia, p. 512
- Thermoregulation, p. 491
- Tidal volume, p. 513
- Ventilation, p. 513
- Vital signs (VS), p. 489
- White coat hypertension, p. 523

The most frequent measurements obtained by health care providers are those of temperature, pulse, blood pressure, respiratory rate, and oxygen saturation. These measurements indicate the effectiveness of circulatory, respiratory, neural, and endocrine body functions. Because of their importance, they are referred to as **vital signs (VS)**. Many factors such as pain, environmental temperature, physical state, activities, or illness can cause vital signs to change, sometimes to values outside an acceptable range. Recently, pain has been referred to as the "fifth vital sign," demonstrating the importance of

its assessment not only as a factor that influences the standard vital signs, but as an indicator of the necessity to ensure the inclusion of its assessment as part of baseline data. A detailed pain assessment is addressed in Chapter 41.

Vital signs provide important data to determine the usual state of health (baseline data). A change in vital signs indicates a change in physiological function, which may signal the need for medical or nursing intervention. Measuring vital signs is a quick and efficient way of monitoring a patient's condition, identifying problems, or evaluating responses to interventions. With knowledge of the physiological variables influencing vital signs and recognition of the relationship of vital signs changes to other physical assessment findings, precise determinations of health are made. Inspection, palpation, and auscultation are used to determine vital signs. These simple skills should not be taken for granted. Careful measurement techniques ensure accurate and consistent findings. Vital signs and other physiological measurements are the basis for clinical problem solving.

Guidelines for Measuring Vital Signs

Vital signs are an important part of all assessments. Data are obtained during a complete physical assessment (see Chapter 31) and as needed to assess a patient's condition. Vital sign measurements during a routine physical examination provide a baseline for future assessments. The patient's needs and condition determine when, where, how, and by whom vital signs are measured. The nurse must measure vital signs correctly or delegate their measurement appropriately. Values must be understood and interpreted, findings communicated appropriately, and interventions begun as needed. Box 30-1 lists acceptable adult values.

Use the following guidelines to incorporate vital sign measurement into your nursing practice:

- Unregulated care providers may measure selected vital signs (i.e., in stable patients), and then the nurse responsible for the patient may interpret and act upon these measurements.
- Use equipment that is functional and appropriate for the size and age of the patient to ensure accurate findings (e.g., an oral thermometer is not appropriate for use in an infant).

- Select equipment on the basis of the patient's condition and characteristics (e.g., an adult-size blood pressure cuff should not be used for a child).
- Minimize environmental factors that may affect vital signs (e.g., assessing the patient's temperature in a warm, humid room may yield a value that is not a true indicator of the patient's condition).
- Use an organized, step-by-step approach to ensure accuracy.
- Approach the patient in a calm, caring manner while demonstrating proficiency in handling supplies needed for vital sign measurement. The manner of approach can alter vital signs.
- Follow guidelines cited in Box 30-2 to decide frequency of vital sign assessment. Increase the frequency of vital sign assessment if the patient's condition warrants it (i.e., frequency of vital signs ordered by the prescribing health care provider is the *minimum* number of times that they should be checked).
- Use vital sign measurements to determine indications for prescribed medication administration (e.g., certain cardiac medications are given only if pulse or blood pressure values are in a certain range; antipyretics are administered only when temperature is elevated outside the acceptable range for the patient).
- Analyze the results of vital sign measurement by considering the patient's usual values, medical history, therapies, and prescribed medications. A patient's usual values may differ from the acceptable range for that age or physical state. Some illnesses or treatments cause predictable changes in vital signs. Some medications affect one or more vital signs. The nurse is often in the best position to assess all clinical findings about a patient and must be knowledgeable of related physical signs or symptoms and the patient's ongoing health status.
- Baseline measurements allow the identification of changes in vital signs. When vital signs appear abnormal, it is useful to have another nurse repeat the measurement. Verify, document, and communicate significant changes in vital signs to the prescribing health care provider or nurse in charge.
- Involve the patient and/or caregiver in vital sign assessment and the significance of findings through implementation of teaching plans as necessary.

► BOX 30-1

Vital Signs: Acceptable Readings for Adults

Temperature Range: 36°C to 38°C (Hooper et al., 2009)

Average oral/tympanic/temporal: 37°C

Average rectal: 37.5°C

Average axillary: 36.5°C

Pulse

60–100 beats per minute

Respirations

12–20 breaths per minute

Blood Pressure

Systolic: 120–139 mm Hg

Diastolic: 80–89 mm Hg

Pulse pressure: 30–50 mm Hg

► BOX 30-2

When to Measure Vital Signs

Upon admission to a health care facility

During a home care visit

According to the prescribing health care provider's order or the health facility's standards of practice

Before, during, and after a surgical procedure or an invasive diagnostic procedure

Before, during, and after the administration of blood products

Before, during, and after administration of medications that affect cardiovascular, respiratory, and temperature-control function

When patient's general physical condition changes (e.g., loss of consciousness or increased pain)

Before and after nursing interventions that affect a vital sign (e.g., before a patient previously on bed rest ambulates or before a patient performs range-of-motion exercises)

When a patient reports nonspecific symptoms of physical distress (e.g., feeling "funny" or "different")

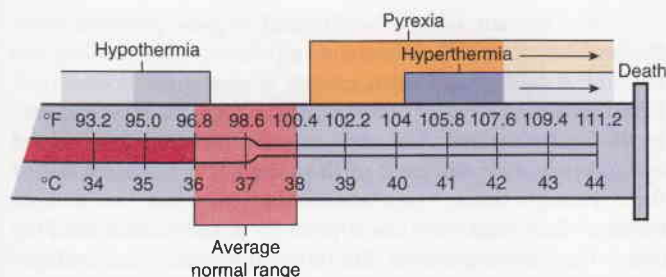


Figure 30-1 Ranges of normal temperature values and physiological consequences of abnormal body temperature.

BOX 30-3

Sites of Measurement of Core and Surface Temperature

Core Temperature

- Rectum
- Tympanic membrane
- Temporal artery
- Esophagus
- Pulmonary artery
- Urinary bladder

Surface Temperature

- Skin
- Mouth
- Axillae

Body Temperature

Physiology

Body temperature is the difference between the amount of heat produced by body processes and the amount lost to the external environment. Despite extremes in environmental conditions and physical activity, temperature-control mechanisms keep the body's **core temperature** (temperature of structures deep within the body) relatively constant (Figure 30-1) whereas body surface temperature fluctuates, depending on blood flow to the skin and the amount of heat lost to the external environment. Because of these surface temperature fluctuations, acceptable body temperature ranges from 36°C to 38°C, a narrow range in which the body's tissues and cells function best.

The measurement of body temperature is aimed at obtaining an average temperature of core body tissues. Sites reflecting core temperatures are more reliable indicators of body temperature than are sites reflecting surface temperatures (Box 30-3). The temperature value obtained may also differ between one measurement site and another. In clinical practice, nurses learn the temperature range of individual patients, recognizing that no single temperature reading is normal for all people.

Regulation. The balance between heat lost and heat produced, or **thermoregulation**, is precisely regulated by physiological and behavioural mechanisms. For body temperature to stay constant and within an acceptable range, the relationship between heat production and heat loss must be closely maintained. This relationship is regulated by neurological and cardiovascular mechanisms. To regulate patients' temperatures, knowledge of temperature-control mechanisms is applied.

Neural and Vascular Control. The **hypothalamus**, located between the cerebral hemispheres, controls body temperature the same way that a thermostat works in a building. A comfortable temperature is the *set point* at which a heating system operates. In the building, a decrease in environmental temperature activates the furnace, whereas a rise in temperature shuts the system down. The hypothalamus is like the building's furnace; it senses minor changes in body temperature. The anterior hypothalamus controls heat loss, and the posterior hypothalamus controls heat production.

When nerve cells in the anterior hypothalamus become heated above the set point, impulses are sent to reduce body temperature. Mechanisms of heat loss include sweating, vasodilation (widening) of blood vessels, and inhibition of heat production. Blood is redistributed to surface vessels to promote heat loss. If the posterior hypothalamus senses that the body's temperature is lower than the set point, heat conservation mechanisms are instituted: vasoconstriction (narrowing) of blood vessels reduces blood flow to the skin and extremities. Compensatory heat is produced through voluntary muscle contraction and muscle shivering. When vasoconstriction is ineffective in preventing additional heat loss, shivering begins. Disease or trauma to the hypothalamus or to the spinal cord, which carries hypothalamic messages, can cause serious alterations in temperature control.

Heat Production. Thermoregulation depends on the normal function of heat production processes. Heat is produced in the body as a by-product of metabolism, the chemical reaction in all body cells. Food is the primary fuel source for metabolism. Activities requiring additional chemical reactions increase metabolic rate. As metabolism increases, additional heat is produced. When metabolism decreases, less heat is produced. Heat production occurs during rest, voluntary movements, involuntary shivering, and nonshivering thermogenesis.

Basal metabolism accounts for the heat produced by the body at absolute rest. The average **basal metabolic rate (BMR)** depends on the body surface area. Thyroid hormones also affect the BMR. By promoting the breakdown of body glucose and fat, thyroid hormones increase the rate of chemical reactions in almost all cells of the body. When large amounts of thyroid hormones are secreted, the BMR can increase 100% above normal. Absence of thyroid hormones can reduce the BMR by half, causing a decrease in heat production. The male sex hormone testosterone increases BMR. Men have a higher BMR than do women. Voluntary movements such as muscular activity during exercise require additional energy. Metabolic rates can increase up to 2000 times normal during exercise. Heat production can increase up to 50 times normal.

Shivering is an involuntary body response to temperature differences in the body. The skeletal muscle movement during shivering requires significant energy. In vulnerable patients, shivering can seriously deplete energy sources, which results in further physiological deterioration. Shivering can increase heat production four to five times greater than normal. The heat produced assists in equalizing body temperature, and shivering ceases.

Nonshivering thermogenesis occurs primarily in newborns and is the main source of heat generation. Until approximately two weeks of age, newborns cannot shiver, thereby relying on vasoconstriction through an increase in norepinephrine (Soll, 2008). In addition, a limited amount of vascular brown tissue (fat) is metabolized for heat production.

Heat Loss. Heat loss and heat production occur simultaneously. The skin's structure and exposure to the environment result in constant, normal heat loss through radiation, conduction, convection, and evaporation.

Radiation is the transfer of heat from the surface of one object to the surface of another without direct contact between the two. Up to 85% of the human body's surface area radiates heat to the environment. Peripheral vasodilation increases blood flow from internal organs to the skin to increase radiant heat loss. Peripheral vasoconstriction minimizes radiant heat loss. Radiation increases as the temperature difference between the objects increases. If the environment is warmer than the skin, the body absorbs heat through radiation.

Heat loss is increased through radiation by removing clothing or blankets. The patient's position enhances radiation heat loss (e.g., standing exposes a greater radiating surface area, and lying in a fetal position minimizes heat radiation). Covering the body with dark, closely woven clothing also reduces the amount of heat lost from radiation.

Conduction is the transfer of heat from one object to another through direct contact. Heat is conducted through contact with solids, liquids, and gases. When warm skin touches a cooler object, heat is lost. Conduction normally accounts for a small amount of heat loss. Interventions such as applying a cool cloth increase conductive heat loss. Applying several layers of clothing reduces conductive loss. The body gains heat by conduction when contact is made with materials warmer than skin temperature (e.g., application of an aquathermia pad).

Convection is the transfer of heat away from the body by air movement. A fan promotes heat loss through convection. Convective heat loss increases when moistened skin comes into contact with slightly moving air.

Evaporation is the transfer of heat energy when a liquid is changed to a gas. The body continuously loses heat by evaporation. About 600 to 900 mL per day evaporates from the skin and lungs, resulting in water and heat loss. By regulating perspiration (sweating), the body promotes additional evaporative heat loss. Millions of sweat glands located in the dermis of the skin secrete sweat through tiny ducts on the skin's surface. When body temperature rises, the anterior hypothalamus signals the sweat glands to release sweat. Sweat evaporates from the skin surface, which results in heat loss. During exercise and emotional or mental stress, sweating is one way to lose excessive heat produced by the increased metabolic rate.

Diaphoresis is visible perspiration, which occurs primarily on the forehead and upper thorax, although it can be seen elsewhere on the body. Excessive evaporation can cause skin scaling and itching, as well as drying of the nares and pharynx. Lowered body temperature inhibits sweat gland secretion. People who have a congenital absence of sweat glands or a serious skin disease that impairs sweating are unable to tolerate warm temperatures because they cannot cool themselves adequately.

Skin in Temperature Regulation. The skin regulates temperature through insulation of the body, vasoconstriction (which affects the amount of blood flow and heat loss to the skin), and temperature sensation. The skin, subcutaneous tissue, and fat keep heat inside the body. When blood flow between skin layers is reduced, the skin alone is an excellent insulator. People with more body fat have more natural insulation than do slim and muscular people.

In the human body, the internal organs produce heat. During exercise or increased sympathetic stimulation, the amount of heat produced is greater than the usual core temperature. Blood flows from the internal organs, carrying heat to the body surface. The skin is well supplied with blood vessels, especially the areas of the hands, feet, and ears. Blood flow through these vascular areas of skin may vary from minimal flow to as much as 30% of the blood ejected from the heart. Heat transfers from the blood through vessel walls to the skin's surface and is lost to the environment through the heat-loss mechanisms. The body's core temperature remains within safe limits.

The degree of vasoconstriction determines the amount of blood flow and heat loss to the skin. If the core temperature is too high, the hypothalamus inhibits vasoconstriction. As a result, blood vessels dilate, and more blood reaches the skin's surface. On a hot, humid day, the blood vessels in the hands are dilated and easily visible. In contrast, if the core temperature becomes too low, the hypothalamus initiates vasoconstriction and blood flow to the skin lessens, thus conserving body heat.

Behavioural Control. Healthy individuals voluntarily act to maintain a comfortable body temperature when exposed to temperature extremes. A person's ability to control body temperature depends on (1) the degree of temperature extreme, (2) the person's ability to sense feeling comfortable or uncomfortable, (3) thought processes or emotions, and (4) the person's mobility or ability to remove or add clothes. Body temperature control is difficult if any of these abilities is absent. Infants can sense uncomfortably warm conditions but cannot change their environment. Older adults may need assistance in detecting cold environments and minimizing heat loss. Illness, altered levels of consciousness, or impaired thought processes result in an inability to recognize the need to change behaviour for temperature control. In extreme temperatures, health-promoting behaviours such as removing or adding clothing, have a limited effect on controlling temperature. It is important for the nurse to assess for factors that place patients at high risk for ineffective thermoregulation.

Factors Affecting Body Temperature

Many factors affect body temperature. Changes in body temperature within an acceptable range occur when the relationship between heat production and heat loss is altered by physiological or behavioural variables. Be aware of these factors when assessing temperature variations and evaluating deviations from normal.

Age. At birth, the newborn leaves a warm, relatively constant environment and enters one in which temperatures fluctuate widely. Temperature-control mechanisms are immature. An infant's temperature may respond dramatically to changes in the environment requiring extra care to protect the newborn. Body coverings must be adequate, and exposure to temperature extremes must be avoided. A newborn loses up to 30% of body heat through the head and therefore needs to wear a cap to prevent heat loss. When protected from environmental extremes, the newborn's core and peripheral body temperature can be normally maintained between 35.5°C and 37.5°C.

Temperature regulation is unstable until children reach puberty. The normal temperature range gradually drops as individuals approach older adulthood. Older adults have a lower and narrower range of body temperatures than do younger adults. An oral temperature of 35°C is not unusual for

older adults in cold weather. However, the average body temperature of older adults is approximately 36°C . Older adults are particularly sensitive to temperature extremes because of deterioration in control mechanisms, particularly poor vasomotor control (control of vasoconstriction and vasodilation), reduced amounts of subcutaneous tissue, reduced sweat gland activity, and reduced metabolism.

Exercise. Muscle activity requires increases in blood supply and in carbohydrate and fat breakdown. This increased metabolism causes an increase in heat production. Any form of exercise can increase heat production and thus body temperature. Prolonged strenuous exercise, such as long-distance running, can temporarily raise body temperatures up to 41°C .

Hormone Level. Women generally experience greater fluctuations in body temperature than men. Hormonal variations in progesterone during the menstrual cycle cause body temperature fluctuations. When progesterone levels are low, the body temperature is a few tenths of a degree below the baseline level. This lower temperature persists until ovulation occurs. During ovulation, greater amounts of progesterone enter the circulatory system and raise the body temperature to previous baseline levels or higher. These temperature variations can be used to predict a woman's most fertile time to achieve pregnancy.

Body temperature changes also occur during menopause (cessation of menstruation). Menopausal women may experience times of intense body heat and sweating, lasting anywhere from 30 seconds to 5 minutes. Skin temperature may increase intermittently by up to 4°C , which is known as a *hot flash*. These increases in temperature result from the instability of the vasomotor controls for vasodilation and vasoconstriction.

Circadian Rhythm. Body temperature normally changes 0.5°C to 1°C during a 24-hour period. In persons who are awake during the day and sleep during the night, the temperature is usually lowest between 0100 and 0400 hours (Figure 30-2). During the day, body temperature rises steadily, until a maximum temperature value is reached at about 1800 hours, and then declines back down to early morning levels. It takes one to three weeks for temperature patterns to reverse in people who work at night and sleep during the day. In general, the circadian temperature rhythm does not change with age.

Stress. Physical and emotional stress increases body temperature through hormonal and neural stimulation. These

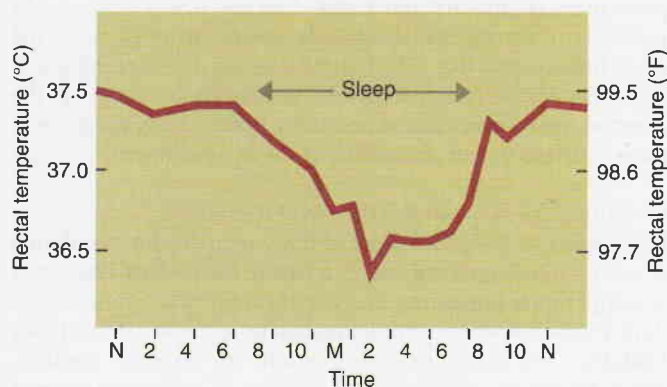


Figure 30-2 Temperature cycle for 24 hours.

physiological changes increase metabolism, which increases heat production. The patient who is anxious about entering a hospital or undergoing a procedure may register a higher normal temperature.

Environment. Environment influences body temperature. If body temperature is measured in a very warm room, a patient may be unable to regulate body temperature by heat-loss mechanisms, resulting in the elevation of body temperature. If the patient has just been outside in the cold without warm clothing, body temperature may be low because of extensive radiant and conductive heat loss. Infants and older adults are most likely to be affected by environmental temperatures because their temperature-regulating mechanisms are less efficient.

Temperature Alterations. Body temperatures outside the usual range affect the hypothalamic set point. Such changes can be related to excess heat production, excessive heat loss, minimal heat production, minimal heat loss, or any combination of these alterations. The nature of the change affects the type of clinical problems experienced.

Fever. Pyrexia, or fever, occurs because heat-loss mechanisms are unable to keep pace with excess heat production; as a result, body temperature rises to an abnormal level. A fever is usually not harmful if it stays below 39°C , keeping in mind that a single temperature reading may not indicate a fever. In addition to physical signs and symptoms of infection, determination of fever is based on several temperature readings at different times of the day that are compared with the usual value for that person at those times.

A true fever results from an alteration in the hypothalamic set point. **Pyrogens** such as bacteria and viruses cause a rise in body temperature. Pyrogens act as antigens, triggering immune system responses. The hypothalamus reacts to raise the set point, and the body responds by producing and conserving heat. Several hours may pass before the body temperature reaches the new set point. During this period, the person experiences chills, shivers, and feels cold, even though the body temperature is rising (Figure 30-3). The chill phase resolves when the new set point, a higher temperature, is achieved. During the next phase, the plateau, the chills subside, and the person feels warm and dry. If the new set point is

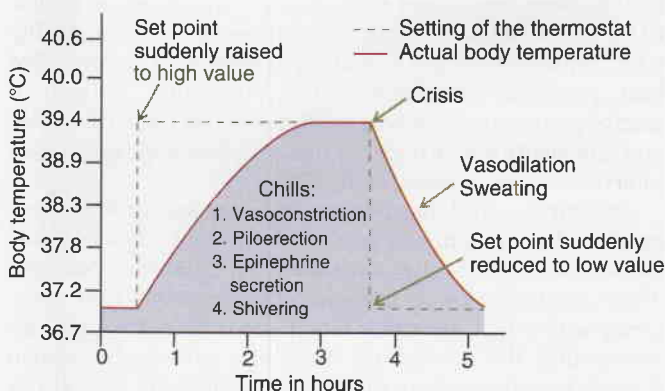


Figure 30-3 Effect of changing the set point of the hypothalamic temperature control during a fever. **Source:** Adapted from Hall, J. E. (2011). *Guyton & Hall textbook of medical physiology* (12th ed., p. 876). Philadelphia, PA: W. B. Saunders.

“overshot” or the pyrogens are removed (e.g., destruction of bacteria by antibiotics), the third phase of a febrile episode occurs. The hypothalamus set point drops, initiating heat loss responses. The skin becomes warm and flushed because of vasodilation. Diaphoresis assists in evaporative heat loss. When the fever “breaks,” the person becomes **afebrile**.

Fever is an important defence mechanism. Temperature elevations up to 38°C enhance the body’s immune system. During a **febrile** episode, white blood cell production is stimulated. Increased temperature reduces the concentration of iron in the blood plasma, suppressing the growth of bacteria. Fever also fights viral infections by stimulating production of interferon, the body’s natural virus-fighting substance.

By analyzing a fever pattern, health care providers can make diagnoses. Fever patterns differ, depending on the causative pyrogen. The increase or decrease in pyrogen activity results in fever spikes and declines at different times of the day. The duration and degree of fever depend on the strength of the pyrogen and the ability of the individual to respond. The term **fever of unknown origin** refers to a fever that does not have a determined cause.

During a fever, cellular metabolism increases and oxygen consumption rises. The body’s metabolism increases 10% for every degree Celsius of temperature elevation (Henker & Carlson, 2007). Heart and respiratory rates increase to meet the metabolic needs of the body for nutrients. The increased metabolism entails the use of energy that produces additional heat. If the patient has a cardiac or respiratory problem, the stress of a fever can be great. A prolonged fever can weaken a person by exhausting energy stores. Increased metabolism requires additional oxygen. If the demand for additional oxygen cannot be met, cellular hypoxia (inadequate oxygenation) occurs. Myocardial hypoxia produces angina (chest pain); cerebral hypoxia produces confusion. Interventions during a fever may include oxygen therapy. Water loss through increased respiration and diaphoresis can be excessive, placing a patient at risk for fluid volume deficit. Dehydration is a serious problem for older adults and for children with low body weight. Maintaining optimum fluid volume status is an important nursing intervention (see Chapter 39).

Hyperthermia. **Hyperthermia** is body temperature that is elevated as a result of the body’s inability to promote heat loss or reduce heat production. Whereas fever is an upward shift in the set point, hyperthermia results from an overload of the body’s thermoregulatory mechanisms. Any disease or trauma to the hypothalamus can impair heat-loss mechanisms. **Malignant hyperthermia** is a hereditary condition of uncontrolled heat production, occurring when susceptible individuals receive particular anaesthetic medications that trigger a sudden and potentially severe hyperthermic response requiring urgent intervention (Hernandez, et al., 2009).

Heatstroke. Prolonged exposure to the sun or high environmental temperatures can overwhelm the body’s heat-loss mechanisms. Heat also depresses hypothalamic function. These conditions cause **heatstroke**, a dangerous heat emergency with a high mortality rate. Patients at risk include the very young, the elderly, and those who have cardiovascular disease, hypothyroidism, diabetes, or alcoholism. Also at risk are patients who take medications that decrease the body’s ability to lose heat (e.g., phenothiazines, anticholinergics, diuretics, amphetamines, and β -adrenergic receptor antagonists) and those who exercise or engage in strenuous physical labour (e.g., athletes, construction workers, and farmers).

► TABLE 30-1 Classification of Hypothermia

Description	Temperature (°C)
Mild	34–36
Moderate	30–34
Severe	<30

Signs and symptoms of heatstroke include confusion, delirium, excess thirst, nausea, muscle cramps, visual disturbances, giddiness, and incontinence. The most important sign is hot, dry skin. Patients with heatstroke do not sweat because of severe electrolyte loss and hypothalamic malfunction. Vital signs reveal a body temperature sometimes as high as 45°C, with an increase in heart rate and lowering of blood pressure. If the condition progresses, unconsciousness can occur. Permanent neurological damage may result unless cooling measures are rapidly started.

Heat Exhaustion. **Heat exhaustion** occurs when profuse diaphoresis results in excessive water and electrolyte loss. The patient exhibits signs and symptoms of fluid volume deficit (see Chapter 39). Treatment includes transporting the patient to a cooler environment and restoring fluid and electrolyte balance.

Hypothermia. Heat loss during prolonged exposure to cold overwhelms the body’s ability to produce heat, causing hypothermia. **Hypothermia** is classified by core temperature measurements (Table 30-1). It can be unintentionally induced (e.g., by falling through the ice of a frozen lake) or intentionally induced (e.g., during specific surgical procedures) to reduce metabolic demand and the body’s need for oxygen. Accidental hypothermia usually develops gradually and may go unnoticed for several hours. When body temperature drops to 35°C, uncontrolled shivering, loss of memory, depression, and poor judgement occur. As the body temperature falls below 34.4°C, heart rate, respiratory rate, and blood pressure fall and the skin becomes cyanotic. If hypothermia progresses, cardiac dysrhythmias, loss of consciousness and unresponsiveness to painful stimuli occur. In cases of severe hypothermia, clinical signs similar to death (e.g., lack of response to stimuli and extremely slow respirations and pulse) are demonstrated. The assessment of core temperature is critical when hypothermia is suspected. A special thermometer that displays low readings may be required because most standard devices do not register below 35°C.

Frostbite occurs when the body is exposed to subnormal temperatures. Ice crystals forming inside cells can result in permanent circulatory and tissue damage. Areas on the body particularly susceptible to frostbite are the earlobes, tip of the nose, fingers, and toes. The injured area becomes white, waxy, and firm to the touch and loss of sensation occurs in the affected area. Intervention includes gradual warming measures, analgesia, and protection of the injured tissue.

Nursing Process and Thermoregulation

Knowledge of the physiology of body temperature regulation is essential for assessing and evaluating the patient’s response to temperature alterations and for intervening safely. Independent measures can be implemented to increase or minimize heat loss, promote heat conservation, and increase comfort. These measures complement the effects of medically ordered therapies. Many measures can be taught to family members, parents of children, and other caregivers.

❖ Assessment

Sites

Core and surface body temperature may be measured at several sites. The core temperatures of the pulmonary artery, esophagus, and urinary bladder are measured in intensive care settings. These measurements require the use of invasive devices placed in body cavities or organs that continuously display readings on an electronic monitor.

Intermittent temperature measurements are obtained invasively from the sites of the mouth, rectum, and tympanic membrane or noninvasively from the axilla and temporal artery sites. Chemically prepared thermometer patches can also be applied to the skin. In order to measure oral, rectal, axillary,

and skin temperature, blood circulation at the measurement site must be effective so that the heat of the blood is conducted to the thermometer probe. Tympanic temperature relies on the radiation of body heat to an infrared sensor. Temporal artery measurements detect cutaneous blood flow temperature (Pompei, 1999). Because they share the same arterial blood supply as the hypothalamus, tympanic and temporal artery temperature measurements can be considered core temperatures (Purssell et al., 2009).

Correct measuring technique must be used at each site (Skill 30-1) to ensure accurate readings. The temperature obtained varies according to the site used but should remain between 36.0°C and 38.0°C. Rectal temperatures are usually 0.5°C

Text continued on p. 500

► SKILL 30-1 Measuring Body Temperature



Delegation Considerations

The task of measuring temperature can be delegated to unregulated care providers (UCPs). The nurse is responsible for assessing the impact of changes in body temperature; therefore, when the task of measuring temperature is delegated, it is important to *inform the unregulated care provider* about the following:

- The appropriate route and device to measure temperature
- Patient-specific factors that can falsely raise or lower temperature
- Appropriate precautions when positioning the patient
- Frequency of temperature measurement for the patient
- Usual values for patient
- Abnormalities that should be reported to the health care provider

Equipment

- Appropriate thermometer
- Soft tissue or wipe
- Alcohol swabs
- Lubricant (for rectal measurements only)
- Pen and either vital sign flow sheet or documentation form
- Disposable gloves
- Plastic thermometer sleeve or disposable probe cover

Procedure

STEPS

1. Assess for signs and symptoms of temperature alterations and for factors that influence body temperature.
2. Determine previous activity that would interfere with accuracy of temperature measurement. Wait before measuring oral temperature in the following situations: 2 minutes after patient has smoked, 5 minutes after patient has chewed gum, and 20 minutes after patient has ingested hot or cold liquids or foods.
3. Determine appropriate temperature site and device for patient.
4. Explain to patient the route by which temperature will be measured and the importance of maintaining proper position until the reading is complete.
5. Perform hand hygiene.
6. Obtain temperature reading.
 - A. Oral temperature measurement with electronic thermometer
 - (1) Put on disposable gloves (optional).
 - (2) Remove thermometer pack from charging unit. Attach oral probe (blue tip) to thermometer unit. Grasp top of probe stem, being careful not to press the ejection button.

RATIONALE

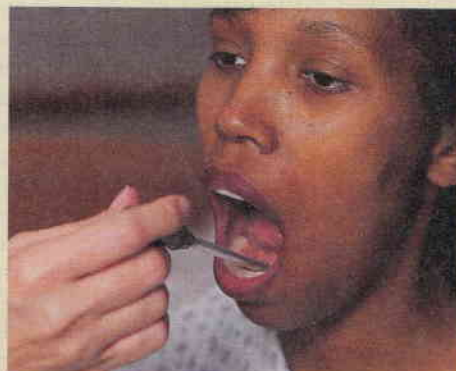
- Physical signs and symptoms may indicate abnormal temperature. You can accurately assess the nature of variations.
- Smoking, mouth breathing, and oral intake of food or fluids can cause false oral temperature readings (Henker & Carlson, 2007).
- This choice is based on advantages and disadvantages of each site (see Box 30-4) (Mains et al., 2008). Use a disposable, single-use thermometer for a patient who has isolation precautions.
- Patients are often curious about measurements and should be cautioned against prematurely removing the thermometer to read results.
- Hand hygiene reduces transmission of microorganisms between the patient and the nurse.
- Use of oral probe cover, removed without physical contact minimizes need to wear gloves.
- Charging provides battery power. Removal of hand-held unit from base prepares it to measure temperature. Pressing ejection button releases plastic probe cover from tip.

Continued

>SKILL 30-1 Measuring Body Temperature—cont'd

video

- (3) Slide disposable plastic probe cover over thermometer probe until cover locks in place (see Step 6A[3] illustration).
 - (4) Have patient sit or lie in bed. Ask patient to open mouth; gently place thermometer probe under patient's tongue in posterior sublingual pocket lateral to centre of lower jaw (see Step 6A[4] illustration).
- Soft plastic cover will not break in patient's mouth and it prevents transmission of microorganisms between patients.
 - Heat from superficial blood vessels in sublingual pocket produces temperature reading. Temperatures in right and left posterior sublingual pockets are significantly higher than in area under front of tongue.

**Step 6A(3)** Inserting thermometer stem into plastic probe cover.**Step 6A(4)** Probe under tongue in posterior sublingual pocket.

- (5) Ask patient to hold thermometer probe with lips closed.
 - (6) Leave thermometer probe in place until audible signal occurs and patient's temperature appears on digital display; remove thermometer probe from under patient's tongue.
 - (7) Push ejection button on thermometer stem to discard plastic probe cover into appropriate receptacle.
 - (8) Return thermometer stem to storage well of recording unit.
 - (9) If gloves were worn, remove and dispose in appropriate receptacle. Perform hand hygiene.
 - (10) Return thermometer to charger.
- B. Rectal temperature measurement with electronic thermometer**
- (1) Prepare patient for procedure.
 - (a) Draw curtain around patient's bed or close room door, or do both.
 - (b) Assist patient in a side-lying or Sims' position with upper leg flexed.
 - (c) Move aside bed linen to expose only anal area. Keep patient's upper body and lower extremities covered with sheet or blanket.
 - (d) Remind patient to remain in position until procedure is complete.
 - (2) Put on disposable gloves.
 - (3) Remove thermometer pack from charging unit. Attach rectal probe (red tip) to thermometer unit. Grasp top of probe stem, being careful not to press the ejection button.
 - (4) Slide disposable plastic probe cover over thermometer probe until cover locks in place.
 - (5) Squeeze liberal portion of lubricant on tissue. Dip thermometer's blunt end into lubricant, covering 2.5–3.5 cm for adult patient or 1.2–2.5 cm for infant/child.
 - (6) With nondominant hand, separate patient's buttocks to expose anus. Ask patient to breathe slowly and relax.
 - (7) Gently insert thermometer into patient's anus in direction of umbilicus, 3.5 cm for adult patient. Do not force thermometer.
 - (8) If resistance is felt during insertion, withdraw thermometer.
- Holding the probe this way helps maintain proper position of thermometer during recording.
 - Probe must stay in place until signal occurs, to ensure accurate reading.
 - Discarding probe cover reduces transmission of microorganisms between patients.
 - Proper storage protects probe from damage. Returning probe automatically causes digital reading to disappear.
 - Glove disposal and hand hygiene reduce transmission of microorganisms between patients.
 - Charging provides battery power.
 - Provides appropriate access for insertion of rectal probe.
 - These actions maintain patient's privacy, minimize embarrassment, and promote comfort. Anal area is exposed for correct thermometer placement.
 - Gloves help maintain standard precautions during exposure to items soiled with body fluids (e.g., feces).
 - Charging provides battery power. Removal of hand-held unit from base prepares it to measure temperature. Pressing the ejection button releases plastic probe cover from tip.
 - Probe cover prevents transmission of microorganisms between patients.
 - Lubrication minimizes trauma to rectal mucosa during thermometer insertion. Tissue avoids contamination of remaining lubricant in container.
 - Separating buttocks fully exposes anus for thermometer insertion. Relaxing anal sphincter facilitates thermometer insertion.
 - Insertion in this direction ensures adequate exposure against blood vessels in rectal wall.
 - This action prevents trauma to mucosa.

► SKILL 30-1 Measuring Body Temperature—cont'd

Critical Decision Point: If thermometer cannot be adequately inserted into rectum, remove thermometer and consider alternative method for obtaining temperature.

- (9) Once positioned, thermometer probe should be left in place (see Step 6B[9] illustration) until audible signal occurs and patient's temperature appears on digital display; remove thermometer probe from anus.
- Probe must stay in place until signal occurs, to ensure accurate reading.



Step 6B(9) Probe positioned in anus.

- (10) Push ejection button on thermometer stem to discard plastic probe cover into appropriate receptacle. Wipe probe adequately with alcohol swab, paying particular attention to ridges where probe cover is connected to probe.
 - (11) Return thermometer stem to storage well of recording unit.
 - (12) Wipe patient's anal area with soft tissue to remove lubricant or feces, and discard tissue. Assist patient to assume a comfortable position and sufficiently covered with linens.
 - (13) Remove and dispose of gloves in appropriate receptacle. Perform hand hygiene.
 - (14) Return thermometer unit to charger. Verify that charger and probes are wiped with alcohol daily (in isolation areas, they are wiped whenever they are removed from the room).
 - Discarding probe cover reduces transmission of microorganisms between patients.
 - Proper storage protects probe from damage. Returning probe automatically causes digital reading to disappear.
 - These actions provide for comfort and hygiene.
- C. Axillary temperature measurement with electronic thermometer**
- (1) Prepare patient for procedure.
 - (a) Draw curtain around patient's bed or close room door, or do both.
 - (b) Assist patient to a supine or sitting position.
 - (c) Move clothing or gown away from patient's shoulder and arm.
 - (2) Remove thermometer pack from charging unit. Ensure oral probe (blue tip) is attached to thermometer unit. Grasp top of probe stem, being careful not to press the ejection button.
 - (3) Slide disposable plastic probe cover over thermometer probe until cover locks in place.
 - Glove disposal and hand hygiene reduce transmission of microorganisms between the patient and the nurse.
 - Charging provides battery power. Wiping with alcohol reduces transmission of microorganisms between the patient and the nurse.
 - These actions maintain patient's privacy, minimize embarrassment, and promote comfort.
 - These positions enable easy access to axilla.
 - This action exposes axilla for correct thermometer probe placement.
 - Charging provides battery power. Removal of hand-held unit from base prepares it to measure temperature. Pressing ejection button releases plastic cover from probe.
 - Soft plastic cover prevents transmission of microorganisms between patients.

Continued

► SKILL 30-1 Measuring Body Temperature—cont'd

video

- (4) Raise patient's arm away from torso; inspect for skin lesions and excessive perspiration. Insert probe into centre of patient's axilla, lower patient's arm over probe, and place arm across patient's chest (see Step 6C[4] illustration).
- Maintains proper position of probe against blood vessels in axilla.



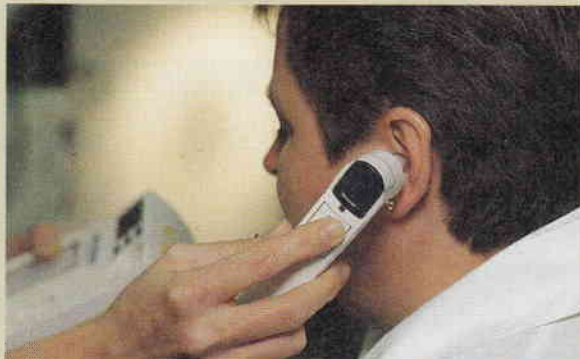
Step 6C(4) Thermometer tip in axilla.

Critical Decision Point: Do not use axilla if skin lesions are present because local temperature may be altered and area may be painful to touch. Wipe off excessive perspiration.

- (5) Hold probe in place until audible signal occurs and temperature appears on digital display.
 - (6) Remove probe from patient's axilla.
 - (7) Push ejection button on thermometer stem to discard plastic probe cover into appropriate receptacle.
 - (8) Return thermometer stem to storage well of recording unit.
 - (9) Assist patient to assume a comfortable position, and move linen or gown back over patient's shoulder.
 - (10) Perform hand hygiene.
 - (11) Return thermometer to charger.
- D. Tympanic membrane temperature measurement with electronic thermometer**
- (1) Assist patient in assuming comfortable position with head turned to side, away from nurse. Right-handed caregivers should obtain temperature from patient's right ear. Left-handed caregivers should obtain temperature from patient's left ear.
 - (2) Check for the presence of obvious cerumen in the patient's ear canal.
 - (3) Remove thermometer hand-held unit from charging base, being careful not to press the ejection button.
 - (4) Slide clean disposable speculum cover over otoscope-like lens tip until it locks into place; be careful not to touch lens cover.
 - (5) Insert speculum into patient's ear canal in accordance with manufacturer's instructions for tympanic probe positioning:
 - (a) Pull patient's pinna backward, up, and out. For children younger than 2 years, pull pinna backward and point covered speculum tip toward midpoint between eyebrow and sideburn.
- Probe must stay in place until signal occurs, to ensure accurate reading.
 - Discarding probe cover reduces transmission of microorganisms between the patient and the nurse.
 - Proper storage protects probe from damage. Returning probe automatically causes digital reading to disappear.
 - Restores comfort and promotes privacy.
 - Hand hygiene reduces transmission of microorganisms between the patient and the nurse.
 - Charging provides battery power.
 - This positioning ensures comfort and exposes auditory canal for accurate temperature measurement. The less acute the angle of approach, the better the probe seal.
 - To ensure clear optical pathway, lens cover of speculum must not be impeded by cerumen. Switch to other ear or select alternative measurement site if necessary.
 - Charging provides battery power. Removal of hand-held unit from base prepares it to measure temperature. Pressing ejection button releases plastic probe cover from tip.
 - Lens cover must be clear of dust, fingerprints, and cerumen to ensure clear optical pathway.
 - Correct positioning of the probe with regard to ear canal ensures accurate readings. Operator errors cause false readings.
 - Ear tug straightens the external auditory canal, allowing maximum exposure of the tympanic membrane (Hockenberry & Wilson, 2007).

► SKILL 30-1 Measuring Body Temperature—cont'd**video**

- (b) Fit otoscope probe snugly into canal and do not move (see Step 6D[5][b] illustration).



- Gentle pressure seals ear canal from ambient temperature, which can alter readings as much as 2.8°C.

Step 6D(5)(b) Tympanic thermometer with probe cover inserted into auditory canal.

- (c) Point speculum tip toward patient's nose.
 - (6) When probe is in place, press scan button on hand-held unit. Leave thermometer probe in place until audible signal occurs and patient's temperature appears on digital display.
 - (7) Carefully remove speculum from auditory canal.
 - (8) Push ejection button on hand-held unit to discard plastic probe cover into appropriate receptacle.
 - (9) If a second reading is necessary, replace probe lens cover and wait 2 to 3 minutes before inserting probe tip.
 - (10) Return hand-held unit to charging base.
 - (11) Assist patient to assume a comfortable position.
 - (12) Perform hand hygiene.
7. Discuss findings with patient as needed.
 8. If patient's temperature is being assessed for the first time and is within normal range, document temperature as baseline.
 9. Compare current temperature reading with patient's previous baseline and with acceptable temperature range for patient's age group.
- When scan button is pressed, probe detects infrared energy. Otoscope tip must stay in place until signal occurs, to ensure accurate reading.
 - Careful removal prevents rubbing of sensitive outer ear lining.
 - Discarding probe cover reduces transmission of microorganisms between the patient and the nurse and automatically causes digital reading to disappear.
 - Lens cover must be free of cerumen to maintain optical path. Time allows auditory canal to regain usual temperature.
 - Proper storage protects probe from damage.
 - This action restores comfort and sense of well-being.
 - Hand hygiene reduces transmission of microorganisms between the patient and the nurse.
 - Such discussion promotes patient's participation in care and understanding of health status.
 - Baseline is used to compare future temperature measurements.
 - Normal body temperature fluctuates within narrow range; comparison helps reveal presence of abnormality. Improper placement or movement of thermometer causes inaccuracies. Second measurement confirms initial findings of abnormal body temperature.

Unexpected Outcomes

Temperature 1°C above usual range

Persistent fever

Temperature 1°C below usual range

Related Interventions

- Assess possible sites (e.g., central line catheter, wounds) for localized infection and for related data suggestive of a systemic infection.
- Implement appropriate nursing measures (see Box 30-10).
- Notify appropriate health care provider and administer antipyretic and antibiotics as prescribed.
- Remove any drafts, wet clothing, or damp linens.
- Apply extra blankets, and, unless contraindicated, offer warm liquids.

Recording and Reporting

- Record temperature on vital sign flow sheet. Document temperature after administration of specific therapies in nurses' narrative notes.
- Report abnormal findings to nurse in charge or to prescribing health care provider.

Home Care Considerations

- Assess temperature and ventilation of patient's environment to determine existence of any environmental condition that may influence outcome of patient's temperature.
- In the home, patients may continue to use mercury-in-glass thermometers (see Box 30-6). Assess whether the storage of these thermometers is adequate to protect them from breakage and to prevent mercury spills. Educate patient and caregiver about mercury hazards.

higher than oral temperatures, and axillary temperatures are usually 0.5°C lower than oral temperatures. Each measurement site has advantages and disadvantages (Box 30-4). The rectal site was traditionally chosen due to the close replication of core body temperature but is now less routinely measured

given the availability of less invasive and accurate alternative measurement devices such as the temporal thermometer. Choose the safest and most effective site for each patient. When possible, use the same site when measurements must be repeated.

► BOX 30-4 Advantages and Disadvantages of Select Temperature Measurement Sites

Tympanic Membrane

Advantages

- Site is easily accessible; minimal patient repositioning is required.
- Temperature reading can be obtained without disturbing or waking patient.
- Device provides core reading, as the eardrum is close to the hypothalamus.
- Measurement is very rapid (2 to 5 seconds).
- Measurement is unaffected by oral intake of food or fluids or by smoking.
- Device can be used for tachypneic patients without affecting breathing.
- Device can be used in newborns to reduce handling of infants and subsequent heat loss.

Disadvantages

- Measurement is more variable with this device than with other core temperature devices.
- Hearing aids must be removed before measurement.
- Site cannot be used in patients following surgery of the ear or tympanic membrane.
- Readings are altered by cerumen impaction and otitis media.
- Disposable probe cover comes in only one size.
- Device does not accurately measure core temperature changes during and after exercise.
- Positioning the device correctly in newborns, infants, and children younger than three years is challenging because of the anatomy of the ear canal (Holtzclaw, 2003).
- Inaccuracies can result from incorrect positioning of unit (Maxton et al., 2004).
- Obtaining continuous measurement is not possible.
- Temperature readings are affected by ambient temperature devices such as incubators, radiant warmers, and fans.

Rectum

Advantages

- Site is argued to be more reliable when oral temperature cannot be obtained.

Disadvantages

- Measurement at this site lags behind those at sites of core temperature during rapid temperature changes (Maxton et al., 2004).
- Site should not be used in patients with diarrhea, rectal surgery, a rectal disorder, or bleeding tendencies.
- Site should not be used for routine measurement of vital signs in newborns.
- Given the invasiveness of this approach and the positioning that is required, this may be a source of patient discomfort, embarrassment, and anxiety.
- Impacted stool alters readings (Maxton et al., 2004).
- Measurement at this site carries risk of exposure to body fluids.
- Lubrication is required.

Mouth

Advantages

- Site is accessible, and no position change is required.
- Measurement is comfortable for patients.

- Measurement provides accurate reading of surface temperature.
- Measurement reflects rapid change in core temperature.

Disadvantages

- Readings are affected by ingestion of fluids or foods, smoking, and oxygen delivery.
- Not suitable for patients who have had oral surgery, have suffered trauma, have a history of epilepsy, or have shaking chills.
- Site should not be used for infants and small children or in confused, unconscious, or uncooperative patients.
- Measurement at this site carries risk of exposure to body fluids.

Axilla

Advantages

- Safe and noninvasive
- Appropriate for use in newborns and in uncooperative or unconscious patients.

Disadvantages

- Measurement time is long.
- Measurement at this site necessitates continuous positioning by nurse.
- Measurement time lags behind those at sites of core temperature during rapid temperature changes.
- Requires exposure of thorax, which can result in temperature loss, especially in newborns.
- Readings are affected by exposure to environment during device placement (Maxton et al., 2004).
- Not recommended for detecting fever in infants and young children.

Skin

Advantages

- Continuous reading can be obtained.
- Safe and noninvasive.
- Requires minimal disturbance to patient.
- Appropriate site for newborn measurement.

Disadvantages

- Measurement time lags behind those at other sites during temperature changes, especially during hyperthermia.
- Adhesion of the thermometer can be impaired by diaphoresis or sweat.
- Measurement at this site can be affected by environmental temperature.
- Cannot be used for patients who have allergy to adhesive.

Temporal Artery

Advantages

- Measurement is rapid.
- Measurement reflects rapid change in core temperature.
- Site is easy to access without changing the patient's position.
- Measurement is comfortable and eliminates need to remove clothing.
- Measurement is useful in premature infants, newborns, and children.

Disadvantages

- Measurement is not effective through head covering (e.g., dressing) or hair.
- Results are affected by diaphoresis or sweating.
- Continuous measurement is not possible.



Figure 30-4 Electronic thermometer. The blue probe is for oral or axillary use. The red probe is for rectal use.

Thermometers

Two types of thermometers are commonly available for measuring body temperature: electronic and disposable. A third type, the mercury-in-glass thermometer, was once the standard device for the clinical setting. Most municipalities have now prohibited the sale or use of mercury-containing medical devices because of potential toxins associated with mercury spills in addition to the potential hazards associated with glass breakage during temperature measurement.

Temperature is recorded according to the **Celsius** scale. Electronic thermometers allow conversion to alternative scales by activating a switch.

Electronic Thermometer. The electronic thermometer consists of a rechargeable battery-powered display unit, a thin wire cord, and a temperature-processing probe covered by a disposable plastic cover (Figure 30-4). Separate unbreakable probes are available for oral and rectal use. The oral probe can also be used for axillary temperature measurement. Electronic thermometers provide two modes of operation: a 4-second predictive temperature and a 3-minute standard temperature. When the first mode is used, a reading appears on the display unit within 20 to 50 seconds of insertion. A signal is sounded when the peak temperature reading has been measured.

Another form of electronic thermometer is used exclusively for tympanic temperature. An otoscope-like speculum with an infrared sensor tip detects heat radiated from the tympanic membrane. Within two to five seconds after the speculum is placed in the auditory canal, a reading appears on the display unit. A signal is sounded when the peak temperature reading has been measured.

Newer to the market is an electronic thermometer that measures the temperature of the superficial temporal artery. A hand-held scanner with an infrared sensor tip detects the temperature of cutaneous blood flow: the sensor is swept across the forehead and just behind the ear (Figure 30-5). Once scanning is complete, a reading appears on the display. Temporal artery temperature is a reliable and noninvasive measure of core temperature and has become an institutional standard in many health care settings (Box 30-5).

The greatest advantages of electronic thermometers are that they can be used immediately and read easily within seconds. The plastic sheath is unbreakable, making these devices ideal for use in children. Their expense is a major disadvantage.



Figure 30-5 Temporal artery thermometer scanning the child's forehead.

► BOX 30-5 Procedural Guideline

Measurement of Temporal Artery Temperature

Delegation Considerations:

The measurement of temporal artery temperature can be delegated to unregulated care providers. The nurse is responsible for assessing the impact of changes on body temperature; therefore, when measurement of temporal artery temperature is delegated, it is important to *inform the unregulated care provider* about the following:

- Frequency of temperature measurement
- Factors that falsely raise or lower temperature readings
- Reporting abnormalities to the nurse for further assessment

Equipment:

Temporal artery thermometer, alcohol wipes or probe cover (optional).

Procedure:

1. Perform hand hygiene.
2. Ensure that the patient's forehead is dry; wipe it with towel if it is moist.
3. Place the probe flush on the patient's forehead to avoid measuring ambient temperature.
4. Press the red scan button with your thumb. Scanning for the highest temperature will be continuous until you release the scan button.
5. Slowly slide the thermometer straight across the patient's forehead while keeping the probe flush on the patient's skin.
6. Keeping scan button pressed, lift the probe from the patient's forehead, and touch the probe to the patient's neck just behind the earlobe (the area where perfume is typically applied).
7. While the probe is scanning, a clicking sound occurs; this sound stops when peak temperature is scanned.
8. Release the scan button; read and record the temperature. Reading remains on screen for 15 seconds after the button is released.
9. Clean the probe with an alcohol wipe, or, if a probe cover was used, remove and dispose of the probe cover.

Maintaining cleanliness of the probes is important. If a rectal probe is not properly cleaned between patients, contamination of the rectal probe by gastrointestinal disease organisms can be a vector of disease transmission. The thermometer must be wiped frequently with alcohol, and the thermometer probe

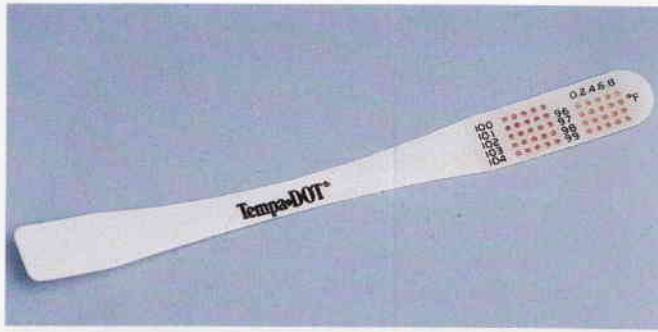


Figure 30-6 Disposable, single-use thermometer strip.

must be wiped with an alcohol swab after each use. Particular attention must be paid to the probe hub, which has ridges, where the probe cover is secured to the probe.

Chemical Strip Thermometers. Single-use or reusable chemical strip (or dot) thermometers are thin strips of plastic containing a temperature sensor at one end. The sensor consists of chemically impregnated dots that change colour at different temperatures in increments of 0.1°C between 35.5°C and 40.4°C (Figure 30-6). Most of these devices are intended for single use, but the dots on reusable strips return to their original colour in seconds. The devices are used for measuring oral or axillary temperatures, particularly in children, and may be used rectally in a special sheath. The thermometer is removed after 60 seconds and read after another wait of 10 seconds to ensure that the temperature reading has stabilized. Research has shown that disposable single-use thermometers tend to overestimate or underestimate true temperature readings. The device is recommended only for screening purposes. When an abnormal temperature is suspected, the temperature should be confirmed with an electronic thermometer. The chemical strip thermometers are useful in caring for patients with isolation precautions (see Chapter 32), to avoid the need to take electronic instruments into these patients' rooms.

Another type of disposable thermometer is a temperature-sensitive patch or tape. Applied to the forehead or abdomen, the patch changes colour at different temperatures. These thermometers are also useful for screening patients, especially infants, for altered temperature. If an abnormal temperature is suspected, the temperature must be confirmed with an electronic temperature device. Disposable thermometers are not appropriate for monitoring temperature therapies.

Glass Thermometers. The traditional glass thermometer is a glass tube sealed at one end and with a mercury—or more recently, due to safety factors, an alcohol-filled bulb—at the other end of the device. Exposure of the bulb to heat causes the internal fluid to expand and rise in the enclosed tube. The length of the thermometer is marked with centigrade (Celsius) calibrations from which the temperature reading is obtained. The thermometer must be positioned properly at the oral, rectal, or axillary site and must be maintained for the appropriate length of time to obtain an accurate reading (Box 30-6). There are many disadvantages to the use of this type of device. In addition to the time delay (approximately three minutes with the device held in place), the mercury-in-glass device is easily breakable and, when broken, releases the contents, which may include hazardous mercury (Box 30-7). With the potent toxicities associated with mercury spills, in addition to

► BOX 30-6 Procedural Guideline

Use of a Glass Thermometer

Delegation Considerations:

Patient, family, or unregulated care provider will safely perform temperature measurement.

Equipment:

Glass thermometer (rectal or oral), plastic sleeve, lubricating jelly (rectal only), disposable gloves.

Procedure:

1. Perform hand hygiene. Apply disposable gloves to avoid contact with body fluids (e.g., saliva, stool).
2. Hold the nonbulbed end of the glass thermometer (if colour-coded, tip will be blue or red) with your fingertips to reduce contamination of the bulb.
3. Read the internal fluid level while gently rotating the thermometer at eye level. If the fluid is above the desired level, grasp the tip of the thermometer securely, stand away from solid objects, and sharply flick your wrist downward. Brisk shaking lowers the fluid level in the glass tube. Continue shaking the thermometer until the reading is below 35.6°C . The thermometer reading must be lower than the patient's actual temperature before the thermometer is used.
4. Insert the thermometer into a plastic sleeve cover, if available, to protect it from body secretions (e.g., saliva, stool). For rectal use, apply lubricant to cover 2.5 cm to 3.5 cm of the rectal thermometer.
5. Place the thermometer according to the technique appropriate for the oral, rectal, or axillary site (see Skill 30-1).
6. Leave the thermometer in place three minutes for oral or rectal temperature, five minutes for axillary temperature, or according to agency policy.
7. Remove the thermometer. Carefully discard the plastic sleeve. Wipe off secretions with a clean tissue, moving toward the bulb or follow institutional cleaning policies. If the device has been used without a plastic sleeve, ensure the thermometer is cleansed with warm, soapy water or rubbing alcohol after use. Store the thermometer in its storage container. Remove your gloves, and perform hand hygiene.
8. Read the thermometer at eye level. Record the findings. Store the thermometer in its storage container. Remove your gloves, and perform hand hygiene.

injuries from the use of glass thermometers, most health care agencies no longer supply these devices. If a glass thermometer is required, the mercury should be replaced with alcohol or other solutions currently available.

Patients may have mercury-in-glass thermometers in their homes. It is important to teach patients and their families what to do in the event of breakage of a mercury-in-glass thermometer.

❖ Nursing Diagnosis

Identify assessment findings and cluster defining characteristics to form a nursing diagnosis. Nursing diagnoses for patients with body temperature alterations include the following:

- *Risk for imbalanced body temperature*
- *Hyperthermia*
- *Hypothermia*
- *Ineffective thermoregulation*

► BOX 30-7

Steps to Take in the Event of a Mercury Spill

1. Do not touch spilled mercury droplets. If skin contact has occurred, immediately flush area with water for 15 minutes.
2. If possible, remove patient from immediate contaminated environment, and shut door to contaminated area.
3. Using rubber gloves, remove any clothing, linen, or shoes contaminated with mercury, and place these items in a plastic garbage bag.
4. Using rubber gloves, contain visible mercury beads with moistened rags or paper towel. Turn off heating or air conditioning systems that could circulate air from spill site to other areas. Turn down thermostat.
5. Follow procedures for mercury removal outlined by local health authority. Notify environmental services department or occupational health services to obtain a mercury spill kit or instructions.
6. Spills are removed using special absorbent materials, filtered vacuum equipment, and protective clothing. Everything is sealed in plastic to be discarded or cleaned according to Environment Canada (2007) guidelines.
7. Keep area well ventilated for 24 hours.
8. Complete incident report as directed by institution procedure.

Adapted from Environment Canada. (2007). *Cleaning up small mercury spills: Mercury and the environment*. Retrieved from <http://www.ec.gc.ca/mercury/en/cu.cfm>.

For example, an increase in body temperature, flushed skin, skin warm to touch, and tachycardia are indicative of the diagnosis *hyperthermia*. The nursing diagnosis is stated as either an at-risk or an actual temperature alteration. If the patient has risk factors for temperature alterations, minimize or eliminate them.

Once the diagnosis is established, accurately determine the related factor or cause (Box 30-8). The related factor directs the selection of appropriate nursing interventions. In the example of hyperthermia, a related factor of vigorous activity will result in interventions much different from those for a related factor of decreased ability to perspire.

❖ Planning

During planning, integrate knowledge gathered from assessment and patient history to develop an individualized care plan (Box 30-9). Match patient's needs with interventions that are supported and recommended in the clinical research literature.

Goals and Outcomes

The care plan for a patient with alteration in temperature must include realistic and individualized goals along with relevant outcomes. Collaborate closely with the patient in setting goals and outcomes and choosing nursing interventions. Expected outcomes are established to gauge progress toward returning the body temperature to an acceptable range. Goals may be short term, such as regaining normal range of body temperature in 24 hours, or long term, such as helping the patient modify the environment, (e.g., obtaining appropriate clothing to wear in cold weather). Outcomes must be related to what is learned about the patient.

► BOX 30-8

NURSING DIAGNOSTIC PROCESS

Assessment Activities	Defining Characteristics	Nursing Diagnosis
Measure vital signs, including temperature, pulse, respirations, and pulse oximetry (SpO ₂).	Increased body temperature above usual range Tachycardia Tachypnea Hypoxemia	Ineffective thermoregulation related to aging and inability to adapt to environmental temperature
Palpate skin.	Warm, dry skin	
Observe patient's appearance and behaviour while talking and resting.	Restlessness Confusion Flushed appearance	
Review medical history.	Location (e.g., found in unventilated apartment during heat wave) and other patient characteristics (e.g., 85 years old with history of dementia)	

Setting Priorities

The severity of temperature alteration and its effects, together with the patient's general health status, influence care priorities. Safety is a top priority. In many cases, other medical problems complicate the care plan. For instance, alterations in body temperature affect the body's requirements for fluids. Patients with cardiac disease may have difficulty tolerating required fluid replacement therapy.

Continuity of Care

Patients at high risk for alterations in body temperature require an individualized care plan directed at maintaining normothermia (normal body temperature) and reducing risk factors. For example, the outcome of care may be that the patient can explain actions to take during a heat wave. Teach the patient and caregiver the importance of thermoregulation and actions to take during very hot weather. Education is particularly important for parents who need to know how to take action at home when an infant or child develops temperature alteration.

❖ Implementation

Health Promotion

Health promotion for patients at risk for altered body temperature is directed toward promoting balance between heat production and heat loss. Patient activity, temperature of the environment, and clothing are all considered. In the prevention of hyperthermia, teach patients to avoid strenuous exercise in hot, humid weather; to drink fluids such as water or clear fruit juices before, during, and after exercise; to wear light, loose-fitting, light-coloured clothes; to avoid exercising

► BOX 30-9 NURSING CARE PLAN

Hyperthermia

Assessment

Mr. Coburn is a 45-year-old teacher who arrives at the outpatient clinic complaining of malaise. His medical history includes a past urinary tract infection. Several of his students have had colds lately. He has been feeling unwell for the past three days.

Assessment Activities

Palpate skin.

Findings and Defining Characteristics

Skin warm and dry to touch

Observe patient's behaviour when talking and resting.

Breathing appears laboured; face is flushed

Measure vital signs.

Blood pressure: right arm, 116/62 mm Hg; left arm, 114/64 mm Hg
Right radial pulse, 128 beats per minute, regular and bounding
Respiratory rate regular at 26 breaths per minute
SpO₂, 98% on room air
Oral temperature, 39.2°C

Review medical history.

Smokes one pack of cigarettes per day and recently began expectorating yellow-green sputum
Tired for past 3 days and dizzy upon rising in the morning

Nursing Diagnosis: Hyperthermia related to infectious process

Planning

Goal (Nursing Outcomes Classification)*

Patient will regain normal range of body temperature within next 24 hours.

Expected Outcomes

Thermoregulation

Body temperature will decline at least 1°C within next 8 hours.
Patient will verbalize increased satisfaction with rest and sleep pattern.

Patient will attain sense of comfort and rest within next 48 hours.

Patient will report increase in energy level within next 3 days.

*Outcome classification label from Moorhead, S., Johnson, M., & Maas, M. L. (2008). *Nursing outcomes classification (NOC)* (4th ed.). St Louis, MO: Mosby.

Interventions (Nursing Interventions Classification)[†]

Fever Treatment

Instruct patient to reduce external coverings and keep clothing and bed linen dry.

Rationale

Heat loss is promoted through conduction and convection.

Instruct patient to monitor temperature at home frequently and take acetaminophen every 4 hours as ordered for temperature higher than 38°C.

Antipyretics reduce set point.

Instruct patient to limit physical activity and increase frequency of rest periods over next 2 days.

Activity and stress increase metabolic rate, contributing to heat production.

[†]Intervention classification label from Dochterman, J. M., Bulechek, G. M., & Butcher, H. K. (Eds.). (2008). *Nursing interventions classification (NIC)* (5th ed.). St Louis, MO: Mosby.

Evaluation

Nursing Actions

Obtain body temperature measurement.

Patient Response and Finding

Body temperature, 37.8°C

Achievement of Outcome

Body temperature is within normal limits.

Ask Mr. Coburn whether his energy level has changed since the last visit.

He responds, "I am sleeping much better and have returned to work with a lot more energy."

Rest and sleep pattern have improved, and energy level has increased.

in areas with poor ventilation; to wear a protective covering over the head when outdoors; and, when entering hot climates, to expose themselves to the heat gradually.

Prevention is key for patients at risk for hypothermia and involves educating not only the patients but family members and friends. Patients most at risk are the extremes of age—very young, very old—and people debilitated by trauma, stroke,

diabetes, drug or alcohol intoxication, sepsis, and Raynaud's disease. Mentally ill and disabled patients may acquire hypothermia because they are unaware of the dangers of cold conditions. People without adequate home heating, shelter, diet, or clothing are also at risk. Fatigue, skin colour (dark-skinned patients are more susceptible), malnutrition, hypoxemia, and body piercing can contribute to the risk of frostbite.

Acute Care

Fever. When body temperature is elevated, it is important to initiate interventions to treat fever. The objective of therapy is to increase heat loss, reduce heat production, and prevent complications.

The procedures used to intervene and treat the temperature depend on the cause, any adverse effects, and the strength, intensity, and duration of the elevation. The nurse plays a key role in assessing and implementing temperature-reducing strategies (Box 30-10). The prescribing health care provider may try to determine the cause of the elevated temperature by isolating the causative pyrogen. Necessary culture specimens for laboratory analysis, such as urine, blood, sputum, and tissue from wound sites (see Chapter 32) may need to be obtained. After the cultures have been sent, the prescribing health care provider orders administration of antibiotic medications to destroy pyrogenic bacteria and eliminate the cause of the elevated temperature.

In children, most fevers are caused by viruses, last only briefly, and have limited effects. Children still have immature temperature-control mechanisms so temperatures can rise rapidly. Dehydration and febrile seizures can occur while

temperatures are rising in children between six months and three years of age. Febrile seizures are unusual in children older than five years. The actual temperature, often exceeding 38.8°C, seems to be more important than the rapidity of the temperature increase. Children are at particular risk for fluid volume deficit because they can quickly lose large amounts of fluids in proportion to their body weight. Maintain accurate intake and output records, and encourage fluid consumption.

A fever may also indicate a hypersensitivity response to a medication. Drug fevers can be accompanied by other symptoms of allergy, such as rash or pruritus. Treatment involves withdrawing the particular medication.

Antipyretics are medications that reduce fever. Nonsteroidals such as acetaminophen, salicylates, indomethacin, and ketorolac reduce fever by increasing heat loss. Corticosteroids reduce heat production by interfering with the immune system and can mask signs of infection. Corticosteroids are not used to treat a fever. However, be aware of their effect on suppressing the patient's ability to develop a fever in response to a pyrogen.

Nonpharmacological therapy for fever involves methods that increase heat loss by evaporation, conduction, convection, or radiation. Blankets cooled by circulating water delivered by motorized units increase conductive heat loss. The manufacturer's instructions for applying these hypothermia blankets must be followed because of risk for skin breakdown and "freeze burns." Placing a bath blanket between the patient and the hypothermia blanket and wrapping distal extremities (fingers, toes, and genitalia) are recommended to reduce the risk of injury to the skin and tissue from hypothermia therapy. Traditional methods such as tepid sponge baths, bathing with alcohol water solutions, applying ice packs to axillae and groin areas, and cooling fans should be used cautiously because they lead to shivering. These methods have no demonstrated advantage over antipyretic medications. Nursing measures to enhance body cooling must attempt to avoid stimulating shivering. Shivering is counterproductive and increases energy expenditure up to 400%. Wrapping the patient's extremities has been recommended to reduce the incidence and intensity of shivering.

Heatstroke. Heatstroke is an emergency. Treatment for heatstroke includes moving the patient to a cooler environment; reducing clothing covering body; placing cool, wet towels over skin; and using oscillating fans to increase convective heat loss. Emergency medical treatment may include intravenous fluids and irrigation of the stomach and lower bowel with cool solutions, in addition to cooling blankets.

Hypothermia. The priority of treatment for hypothermia is to prevent a further decrease in body temperature. Removing wet clothes and replacing with dry clothes and wrapping the patient in blankets are key interventions. In health care settings, forced-air warming blankets can actively rewarm hypothermic patients. Away from a health care setting, the patient should be laid under blankets next to a warm person. A conscious patient should drink hot liquids (e.g., soup) and avoid alcohol and caffeine. Keep the patient's head covered, place the patient near a fire or in a warm room, or place heating pads next to areas of the patient's body (head and neck) that lose heat most rapidly.

Restorative and Continuing Care

Educate the patient who has been febrile about the importance of taking and continuing antibiotics as directed until the course

BOX 30-10 Nursing Measures for Patients With a Fever

Assessment

- Obtain core temperature during each phase of a febrile episode.
- Assess for contributing factors such as dehydration, infection, and environmental temperature.
- Identify physiological response to temperature.
- Measure all vital signs.
- Observe skin colour.
- Assess skin temperature.
- Observe for shivering and diaphoresis.
- Assess the patient's comfort and well-being.
- Determine phase of fever: chill, plateau, or fever break.

Interventions (Unless Contraindicated)

- Obtain blood cultures when ordered: Blood specimens are obtained to coincide with temperature spikes when the antigen-producing organism is most pervasive.
- Minimize heat production: Reduce frequency of activities that increase oxygen demand, such as excessive turning in bed; allow rest periods; limit physical activity.
- Maximize heat loss: Reduce external covering on patient's body to promote heat loss through radiation and conduction without inducing shivering; keep clothing and bed linen dry to increase heat loss through conduction and convection.
- Meet requirements for increased metabolic rate: Provide oxygen as ordered to improve oxygen delivery to body cells; provide measures to stimulate appetite; offer well-balanced meals; provide fluids (3 L per day for patient with normal cardiac and renal function) to replace fluids lost through insensible water loss and sweating.
- Promote patient comfort: Encourage the patient to practise oral hygiene for dry oral mucous membranes; control environmental temperature without inducing shivering (between 21°C and 27°C).
- Identify febrile episode phases: Examine previous temperature measurements to identify trends.
- Initiate health teaching as indicated.

of treatment is completed. Children and older adults are at risk for fluid volume deficit because they can quickly lose large amounts of fluids in proportion to their body weight. Encourage intake of preferred fluids.

❖ Evaluation

All nursing interventions are evaluated by comparing the patient's actual response with the expected outcomes of the care plan. This evaluation reveals whether goals of care have been met or whether the plan must be revised. After any intervention, measure the patient's temperature to evaluate for change. Use other evaluative measures such as palpation of the skin and assessment of pulse and respirations. If therapies are effective, body temperature will return to an acceptable range, other vital sign measurements will stabilize, and the patient will report a sense of comfort.

Pulse

The pulse is the bounding of arterial blood flow that is palpable at various points on the body. Blood flows through the body in a continuous circuit. The pulse is an important indicator of the status of the circulatory system.

Physiology and Regulation

Electrical impulses originating from the sinoatrial node travel through heart muscle to stimulate cardiac contraction. Approximately 60 to 70 mL of blood enters the aorta with each ventricular contraction (**stroke volume**). With each stroke volume ejection (blood pushed out of the heart), the walls of the aorta distend, creating a pulse wave that travels rapidly toward the distal ends of the arteries. When a pulse wave reaches a peripheral artery, it can be felt by palpating the artery lightly against underlying bone or muscle. The number of pulsing sensations occurring in one minute is the *pulse rate*.

The volume of blood pumped by the heart during one minute is the **cardiac output**: the product of heart rate and ventricular stroke volume. In an adult, the heart pumps about 5000 mL of blood per minute (e.g., if heart rate is 70 beats per minute and stroke volume is 70 mL, the cardiac output is 4900 mL per minute). A change in heart rate or stroke volume does not always change the heart's output or the amount of blood in the arteries. Mechanical, neural, and chemical factors regulate the strength of heart contractions and its stroke volume. When these factors are unable to alter stroke volume, the heart rate changes to subsequently adjust blood pressure (BP). As heart rate increases, the heart has less time to fill. Without a change in stroke volume, blood pressure decreases. As the heart rate slows, filling time is increased, and blood pressure increases. The inability of blood pressure to respond to increases or decreases in heart rate may indicate a health deviation and must be reported to the prescribing health care provider. An abnormally slow, rapid, or irregular pulse alters cardiac output. It is important to be able to assess the ability of the patient's heart to meet the demands of the body tissues for nutrients by palpating a peripheral pulse or by using a stethoscope to listen to heart sounds (apical rate).

Assessment of Pulse

Any artery can be assessed for pulse rate, but the radial artery is commonly used because it is easily palpated. When a patient's condition suddenly worsens, the carotid artery is the

recommended site for quickly finding a pulse. The heart will continue delivering blood through the carotid artery to the brain as long as possible. When cardiac output declines significantly, peripheral pulses weaken and are difficult to palpate. Nurses most commonly assess the radial and apical pulses in adult patients, but people who are learning to monitor their own heart rates use the radial or carotid pulse (e.g., athletes, patients taking medications for cardiac disease, and patients starting a prescribed exercise regimen). If the **radial pulse** at the wrist is abnormal or intermittent, or if it is inaccessible because of a dressing or cast, assess the apical pulse. When a patient takes medication that affects the heart rate, the apical pulse provides a more accurate assessment of cardiac function. In infants or young children, it is best to assess the brachial or apical pulse because other peripheral pulses are deep and difficult to palpate accurately.

Assessment of other peripheral pulse sites, such as the popliteal or femoral, is unnecessary in routine measurement of vital signs. These alternative peripheral pulses are assessed during a complete physical examination, when surgery or treatment has impaired blood flow to a body part, or when a patient has clinical indications of impaired peripheral blood flow (see Chapter 31). Table 30-2 summarizes pulse sites and criteria for measurement. Skill 30-2 outlines pulse rate assessment. Table 30-3 lists acceptable pulse rate ranges.

Use of a Stethoscope. Use a stethoscope to assess the apical rate (Figure 30-7). The five major parts of the stethoscope are the earpieces, binaurals, tubing, bell chest piece, and diaphragm chest piece.

The plastic or rubber earpieces fit snugly and comfortably in your ears. The binaurals are angled and strong enough so that the earpieces stay firmly in the ears without causing discomfort. To ensure the best reception of sound, the earpieces follow the contour of the ear canal, pointing toward the face when the stethoscope is in place. Stethoscopes can have single or dual tubes. The tubing has thick walls and is flexible yet moderately rigid to eliminate transmission of environmental noise and to prevent the tubing from kinking. Tubing that is longer than 30 to 40 cm decreases the transmission of sound waves, making it more difficult to accurately auscultate sounds.

The chest piece consists of a bell and a diaphragm that are typically rotated from one to the other into position. The diaphragm or bell must be in proper position to hear sounds through the stethoscope. Test the position of the chest piece by tapping lightly on the diaphragm to determine which side is functioning. The diaphragm is the circular, flat portion of the chest piece and is covered by a thin plastic disk. It transmits high-pitched sounds created by the high-velocity movement of air and blood. Lung, heart, and bowel sounds are best auscultated by using the diaphragm. Position the diaphragm to make a tight seal against the patient's skin (Figure 30-8). Exert enough pressure to leave a temporary red ring on the patient's skin when the diaphragm is removed.

The bell is the bowl-shaped chest piece usually surrounded by a rubber ring. The ring avoids chilling the patient with cold metal when the chest piece is placed on the skin. The bell transmits low-pitched sounds created by the low-velocity movement of blood. Heart and vascular sounds are auscultated through the bell. Apply the bell lightly, resting the chest piece on the patient's skin (Figure 30-9). Compressing the bell against the skin reduces low-pitched sound amplification and

Text continued on p. 511

► TABLE 30-2 Pulse Sites

Site (Artery)	Location	Use and Assessment Criteria
Temporal	Over temporal bone of head, above and lateral to eye	Of significance in the diagnosis of temporal arteritis
Carotid	Along medial edge of sternocleidomastoid muscle in neck	During physiological shock or cardiac arrest, when other sites are not palpable
Apical	Fourth to fifth intercostal space at left midclavicular line	Auscultation is performed to obtain apical pulse
Brachial	Groove between biceps and triceps muscles at antecubital fossa	Provides status of circulation to lower arm; to auscultate blood pressure
Radial	Radial or thumb side of forearm at wrist	Common site to assess peripheral pulse and status of circulation to hand
Ulnar	Ulnar side of forearm at wrist	Assess status of circulation to hand; also to perform Allen's test (test for patency of radial artery)
Femoral	Below inguinal ligament, midway between symphysis pubis and anterior superior iliac spine	Appropriate location to assess pulse during physiological shock or cardiac arrest when other pulses are not palpable; to assess status of circulation to leg
Popliteal	Behind knee in popliteal fossa	Assess status of circulation to lower leg
Posterior tibial	Inner side of ankle, below medial malleolus	Assess status of circulation to foot
Dorsalis pedis	Along top of foot, between extension tendons of the great toe and next toe	Assess status of circulation to foot

► SKILL 30-2 Assessing the Radial and Apical Pulses

**Delegation Considerations**

The task of pulse measurement can be delegated to unregulated care providers (UCPs). The nurse is responsible for assessing changes in pulse; therefore, when the task of pulse measurement is delegated, it is important to *inform the unregulated care provider* about the following:

- Patient's history or risk for irregular pulse
- Frequency of pulse measurement in patient
- Patient's usual pulse values
- Abnormalities that should be reported to the health care provider

Equipment

- Stethoscope (for measurement of apical pulse only)
- Watch or clock with second hand or digital display
- Pen and either vital sign flow sheet or documentation record
- Alcohol swab

Procedure**STEPS**

1. Determine need to assess radial or apical pulse.
 - A. Note risk factors for alterations in apical pulse.
 - B. Assess for signs and symptoms of altered stroke volume and cardiac output, such as dyspnea, fatigue, chest pain, orthopnea, syncope, palpitations (unpleasant awareness of heartbeat), jugular venous distension, edema of dependent body parts, and cyanosis or pallor of skin.
2. Assess for factors that normally influence pulse rate and rhythm: age, exercise, position changes, fluid balance, medications, temperature, sympathetic nervous system stimulation.
3. Determine previous baseline apical rate (if available) from patient's record. Otherwise, note baseline radial rate.
4. Explain to patient that pulse or heart rate is to be assessed. If patient was active, wait 5–10 minutes before taking his or her pulse. Encourage patient to relax and not to speak.

RATIONALE

- Use clinical judgement to determine need for assessment.
- Certain conditions heighten risk for pulse alterations (e.g., cardiac disease, cardiac dysrhythmias, sudden chest pain or acute pain from any site, invasive cardiovascular diagnostic tests, surgery, sudden infusion of large volume of intravenous fluid, hemorrhage, administration of medications that alter cardiac function).
- Physical signs and symptoms may indicate alteration in cardiac function.
- These assessments enable you to accurately evaluate the presence and significance of pulse alterations. Acceptable range of pulse rate changes with age (see Table 30-3).
- By comparing rates you can assess for change in patient's condition and evaluate future apical pulse measurements.
- Activity and anxiety elevate heart rate. Patient's voice interferes with your ability to hear sound when you measure apical pulse. Measuring pulse rates at rest allows for objective comparison of values.

Continued

► SKILL 30-2 Assessing the Radial and Apical Pulses—cont'd



5. Perform hand hygiene.
6. If necessary, draw curtain around patient's bed or close room door, or do both.
7. Obtain pulse measurement.
 - A. Radial pulse
 - (1) Assist patient to assume a supine or sitting position.
 - (2) If patient is supine, place patient's forearm straight alongside body, across lower chest, or across upper abdomen with wrist extended straight (see Step 7A[2] illustration). If patient is sitting, bend patient's elbow 90 degrees and support lower arm on chair or on your arm. Slightly flex patient's wrist with palm down (see Step 7A[2] illustration).
 - (3) Place tips of your first two or middle three fingers over groove along radial or thumb side of patient's inner wrist (see Step 7A[3] illustration).



Step 7A(2) Pulse check with patient's forearm at side with wrist extended.

- (4) Lightly compress your fingertips against patient's radius, obliterate pulse initially, and then relax pressure so that pulse becomes easily palpable.
- (5) Determine strength of pulse. Note whether thrust of vessel against your fingertips is bounding (+4), strong (+3), weak (+2), thready (+1), or absent (0).
- (6) After you can feel a regular pulse, look at watch and begin to count pulse rate when second hand reaches a number on watch dial; start counting pulse with "one," then "two," and so on.
- (7) If pulse is regular, count rate for 30 seconds and multiply total by 2.
- (8) If pulse is irregular, count rate for 1 minute (60 seconds). Assess frequency and pattern of irregularity. Compare bilateral radial pulses.

- Hand hygiene reduces transmission of microorganisms between the patient and the nurse.
- These actions maintain patient's privacy, minimize embarrassment, and promote comfort.
- These positions enable easy access to pulse sites.
- Relaxed position of lower arm and slight flexion of wrist promotes exposure of artery to palpation without restriction.
- Fingertips are the most sensitive parts of the hand to palpate arterial pulsation. The thumb has pulsations that may interfere with accuracy.



Step 7A(3) Hand placement for pulse checking radial pulse.

- Pulse is more accurately assessed with moderate pressure. Too much pressure occludes pulse and impairs blood flow.
- Strength reflects volume of blood ejected against arterial wall with each heart contraction. Accurate description of strength improves communication among health care providers, although keep in mind this is subjective data.
- You can determine pulse rate accurately only after you can palpate the pulse. Count of "one" is the first beat palpated after you begin timing.
- A 30-second count is accurate for rapid, slow, or regular pulse rates.
- Inefficient contraction of heart fails to transmit pulse wave, interfering with cardiac output, resulting in irregular pulse. Longer measurement time ensures accurate count.

Critical Decision Point: If pulse is irregular, assess apical or radial pulse to detect a pulse deficit. Count apical pulse rate while a colleague counts radial pulse rate. Begin apical pulse count out loud to simultaneously assess pulses. If pulse count differs by more than two, a pulse deficit exists; this can indicate altered cardiac output.

- B. Apical pulse
 - (1) Perform hand hygiene; clean earpieces and diaphragm of stethoscope with alcohol swab.
 - (2) Draw curtain around patient's bed or close room door, or do both.
 - (3) Assist patient to supine or sitting position. Move aside bed linen and gown to expose sternum and left side of chest.

- These actions reduce transmission of microorganisms between patients and when stethoscopes are shared.
- These actions maintain patient's privacy, minimize embarrassment, and promote comfort.
- Expose portion of patient's chest wall to select auscultatory site.

SKILL 30-2 Assessing the Radial and Apical Pulses—cont'd

video

(4) Locate anatomical landmarks to identify the *point of maximal impulse* (PMI), also called the *apical impulse* (see Steps 7B(4)(a) to 7B(4)(d) illustrations). Heart is located behind and to left of sternum with base at top and apex at bottom. Find angle of Louis just below suprasternal notch between sternal body and manubrium; it can be palpated as a bony prominence (see Step 7B(4)(a) illustration). Slip fingers down each side of angle to find second intercostal space (ICS; see Step 7B(4)(b) illustration). Carefully move fingers down left side of sternum to fifth ICS (see Step 7B(4)(c) illustration) and laterally to the left midclavicular line (MCL; see Step 7B(4)(d) illustration). A light tap felt in an area within 1 to 2 cm of the PMI is reflected from the apex of the heart.

- Use of anatomical landmarks allows correct placement of stethoscope over apex of heart, enhancing ability to hear heart sounds clearly. In a patient with large breasts, ask the patient to move the breast aside so that you can access the PMI site. If you are unable to palpate the PMI, reposition patient on left side. In the presence of severe cardiac disease, the PMI may be located to the left of the MCL or at the sixth ICS.



Step 7B(4)(a) Locating the angle of Louis.



Step 7B(4)(b) Locating the second intercostal space.



Step 7B(4)(c) Locating the fifth intercostal space.



Step 7B(4)(d) Identifying the midclavicular line.

(5) Place diaphragm of stethoscope in palm of your hand for 5 to 10 seconds.

- By warming metal or plastic diaphragm, you avoid startling patient and promote patient's comfort.

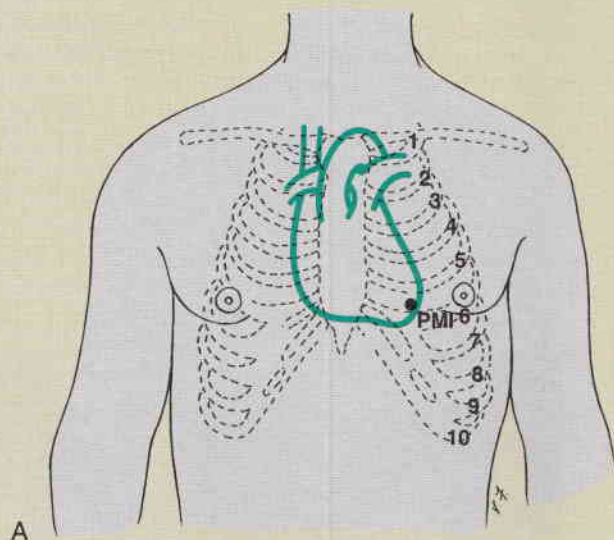
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► SKILL 30-2 Assessing the Radial and Apical Pulses—cont'd



- (6) Place diaphragm of stethoscope over PMI at the fifth ICS, at left MCL, and auscultate for normal S_1 and S_2 heart sounds (heard as “lub-dub”; see Step 7B[6] illustrations).

- Allow stethoscope tubing to extend straight without kinks that would distort sound transmission. Normally, S_1 and S_2 heart sounds are high-pitched and best heard with the diaphragm.



Step 7B(6) A, Location of point of maximal impulse (PMI) in adult. B, Stethoscope placement over PMI.

- (7) When S_1 and S_2 are heard with regularity, look at watch and begin to count rate: when second hand reaches a number on watch dial, start counting with “one,” then “two,” and so on.
- (8) If apical rate is regular, count for 30 seconds and multiply by 2.

- You can accurately determine apical rate only after you can auscultate sounds clearly. Count of “one” is first sound auscultated after timing begins.
- Regular apical rate can be assessed within 30 seconds.

Critical Decision Point: If heart rate is irregular or if patient is receiving cardiac medication, count for 1 minute (60 seconds). An irregular rate is more accurately assessed when measured over a longer interval.

- (9) If heart rate is irregular, or patient is receiving cardiovascular medication, count for a full 1 minute (60 seconds), describe pattern of irregularity (S_1 and S_2 occurring early or later after previous sequence of sounds; e.g., every third or every fourth beat is skipped).
- (10) Replace patient's gown and bed linen; assist patient to return to comfortable position.
- (11) Clean earpieces and diaphragm of stethoscope with alcohol swab as necessary.
8. Perform hand hygiene.
 9. Discuss findings with patient as needed.
 10. Compare current readings with previous baseline measurement or acceptable range of heart rate for patient's age (see Table 30-3).
 11. Compare peripheral pulse rate with apical rate, and note any discrepancy.
 12. Compare radial pulse equality between arms, and note any discrepancy.
 13. Correlate pulse rate with data obtained from blood pressure and related signs and symptoms (palpitations, dizziness).
- Regular occurrence of dysrhythmia within 1 minute may indicate inefficient contraction of heart and alteration in cardiac output.
 - These actions restore patient's comfort and promote sense of well-being.
 - Cleaning with an alcohol swab helps control transmission of microorganisms between patients and when the stethoscope is shared.
 - Hand hygiene reduces transmission of microorganisms between patients.
 - Such discussion promotes patient's participation in care and understanding of health status.
 - Evaluate for change in condition and alterations.
 - Differences between measurements indicate pulse deficit and possibly cardiovascular compromise. Abnormalities may necessitate therapy.
 - Differences between radial arteries indicate compromised peripheral vascular system.
 - Pulse rate and blood pressure are interrelated.

► SKILL 30-2 Assessing the Radial and Apical Pulses—cont'd



Unexpected Outcomes

Radial pulse is weak or thready

Apical pulse is greater than 100 beats per minute (tachycardia)

Apical pulse is less than 60 beats per minute (bradycardia)

Related Interventions

- Assess both radial pulses and compare findings. Local obstruction to one extremity (e.g., clot, edema) may decrease peripheral blood flow.
- Perform complete assessment of all pulses (see Chapter 31).
- Observe for symptoms associated with decreased tissue perfusion, such as pallor and cool skin temperature of tissue distal to the weak pulse.
- Measure apical and radial pulse simultaneously to determine presence of pulse deficit.
- Assess for presence of fever, anxiety, pain, recent exercise, hypotension, decreased oxygenation, or dehydration, all of which can elevate pulse.
- Measure all vital signs.
- Assess for factors associated with decreased cardiac output, such as chest pain, dizziness, cyanosis, fatigue, and orthopnea.
- Assess for the presence of factors that may alter heart rate, such as digoxin or other cardiac medications. It may be necessary to withhold prescribed medications until the prescribing health care provider can evaluate the need to adjust dosage.
- Assess for factors associated with decreased cardiac output.

Recording and Reporting

- Record pulse rate with assessment site in nurses' notes or vital signs flow sheet. Document pulse rate in nurses' narrative notes after administration of specific therapies.
- Report abnormal findings to nurse in charge or prescribing health care provider.

Home Care Considerations

- Assess home environment to determine which room will afford quiet environment for auscultating apical rate.

► TABLE 30-3

Acceptable Ranges of Heart Rate

Age	Heart Rate (Beats per Minute)
Infant	120–160
Toddler	90–140
Preschooler	80–110
School-aged child	75–100
Adolescent	60–90
Adult	60–100

Data from Kinney, M. R., Dunbar, S. B., Brooks-Brunn, J., Molter, N., & Vitello-Cicciu, J. M. (1998). *AACN's clinical reference for critical care nursing* (4th ed.). St Louis, MO: Mosby.

creates a “diaphragm of skin.” Some stethoscopes have just one chest piece that combines the features of the bell and diaphragm. With the use of light pressure, the chest piece acts as a bell; with more pressure, it acts as a diaphragm.

The stethoscope is a delicate instrument and requires proper care for optimal function. The earpieces should be removed regularly and cleaned according to the manufacturer's instructions (to remove cerumen). The bell and diaphragm need to be cleaned (to remove dust, lint, and body oils) routinely with alcohol to prevent transmission of microorganisms. The tubing can be cleaned with mild soap and water. Nurses are encouraged to have their own stethoscope. If several nurses use the same stethoscope, the earpieces should be cleansed with an antiseptic prior to each use.

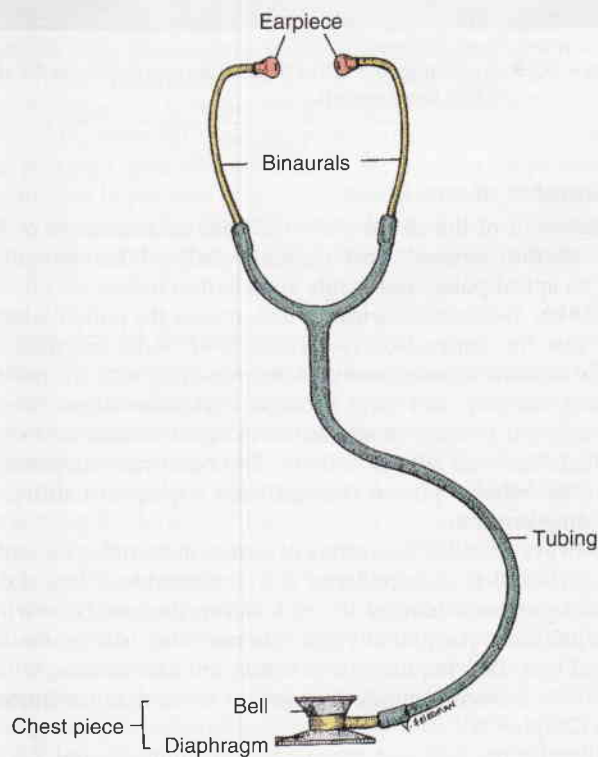


Figure 30-7 Parts of a stethoscope.



Figure 30-8 Positioning the diaphragm of the stethoscope firmly and securely when high-pitched heart sounds are auscultated.

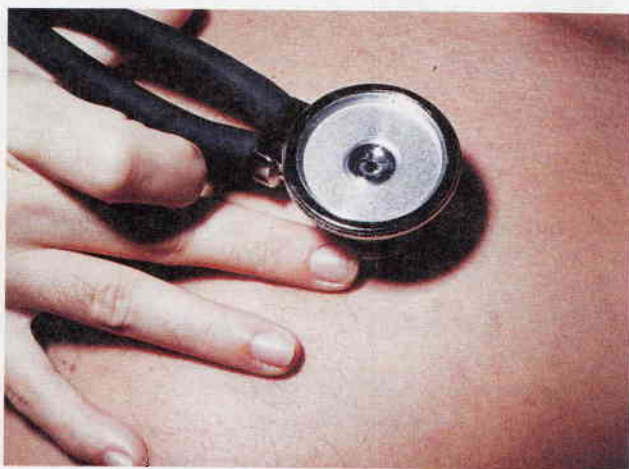


Figure 30-9 Positioning the bell of the stethoscope lightly on the skin to hear low-pitched heart sounds.

Character of the Pulse

Assessment of the radial pulse includes measurement of the rate, rhythm, strength, and bilateral equality. When auscultating an apical pulse, assess rate and rhythm only.

Rate. Before measuring a pulse, review the patient's baseline rate for comparison (see Table 30-3). Some practitioners make baseline measurements of the pulse rate with the patient sitting, standing, and lying. Changes in posture cause changes in pulse rate because of alterations in blood volume and sympathetic nervous system activity. The heart rate temporarily increases when a person changes from a lying to a sitting or standing position.

Always consider the variety of factors influencing the pulse rate (Table 30-4). A single factor or a combination of factors can cause significant changes. If you detect an abnormal rate while you palpate a peripheral pulse, the next step is to assess the apical rate. This requires auscultation of heart sounds, which provides a more accurate assessment of cardiac contraction (see Chapter 31).

Identify the first and second heart sounds (S_1 and S_2). At normal slow rates, S_1 is low-pitched and dull, sounding like a "lub." S_2 is higher-pitched and shorter, creating the sound

► **TABLE 30-4** Factors Influencing Pulse Rates

Factor	Increases Pulse Rate	Decreases Pulse Rate
Exercise	Short-term exercise	Long-term exercise, which conditions the heart and results in a lower resting pulse and a quicker return to resting level after exercise
Temperature	Fever and heat	Hypothermia
Emotions	Anxiety increases sympathetic stimulation, affecting heart rate	Relaxation
Pain	Acute pain, which increases sympathetic stimulation and thereby increases heart rate; the effect of chronic pain on heart rate varies	Unrelieved severe pain, which increases parasympathetic stimulation and thereby affects heart rate
Medications	Positive chronotropic medications such as epinephrine	Negative chronotropic medications such as digitalis, alpha-adrenergic blockers, and calcium channel blockers
Hemorrhage	Loss of blood increases sympathetic stimulation	
Postural changes	Standing or sitting	Lying down
Pulmonary conditions	Diseases causing poor oxygenation, such as asthma and chronic obstructive pulmonary disease (COPD)	

"dub." Each set of "lub-dub" is counted as one heartbeat. Using the diaphragm or bell of the stethoscope, count the number of "lub-dubs" occurring in one minute.

Peripheral and apical pulse rate assessment may reveal variations in heart rate. Two common abnormalities in pulse rate are tachycardia and bradycardia. **Tachycardia** is an abnormally fast heart rate, more than 100 beats per minute in adults. **Bradycardia** is a slow heart rate, less than 60 beats per minute in adults.

An inefficient contraction of the heart that fails to transmit a pulse wave to the peripheral pulse site creates a pulse deficit. Two people are required to detect a **pulse deficit**; one to assess either the radial or apical rate, and the second to simultaneously assess the other rate. Then the two rates are compared.

The difference between the apical and radial pulse rates is the pulse deficit. For example, if the apical rate is 92 beats per minute and the radial rate is 78 beats per minute, the pulse deficit is 14 beats per minute. Pulse deficits are frequently associated with abnormal rhythms.

Rhythm. Normally, a regular interval occurs between each pulse or heartbeat. An interval interrupted by an early or late beat or a missed beat indicates an abnormal rhythm, or **dysrhythmia**. Dysrhythmia threatens the heart's ability to provide adequate cardiac output, particularly if it occurs repetitively. Dysrhythmia is identified by palpating an interruption in successive pulse waves or auscultating an interruption between heart sounds. If dysrhythmia is present, assess the regularity of its occurrence and auscultate the apical rate (see Chapter 31). Dysrhythmias are described as "regularly irregular" or "irregularly irregular."

To document a dysrhythmia, a prescribing health care provider may order electrocardiography, Holter monitoring, or telemetry. In electrocardiography, the electrical activity of the heart is recorded for a 12-second interval. The Holter monitor records 24 hours of electrical activity in a small recorder that the patient wears. In cardiac telemetry, the heart's electrical activity is monitored continuously, and the data are transmitted to a stationary monitor. Telemetry enables observation of heart rhythm during all the patient's daily activities and thus allows for immediate treatment if the rhythm becomes erratic or unstable.

Strength. The strength of a pulse reflects both the volume of blood ejected against the arterial wall with each heart contraction and the condition of the arterial vascular system leading to the pulse site. Normally, the pulse strength remains the same with each heartbeat. Pulse strength may be graded or described as bounding, strong, weak, thready, or absent. It is included during assessment of the vascular system (see Chapter 31).

Equality. Pulses on both sides of the body should be assessed to compare their characteristics. A pulse in one extremity may be unequal to the pulse in the other extremity in strength, or it may be absent in many disease states (e.g., thrombus [clot] formation). All symmetrical pulses can be assessed simultaneously except for the carotid pulses, which should never be measured simultaneously because excessive pressure may occlude blood supply to the brain or trigger carotid reflexes that may result in altered cardiac output.

Nursing Process and Pulse Determination

Pulse assessment helps to determine the general state of cardiovascular health and the body's response to other system imbalances. Tachycardia, bradycardia, and dysrhythmia are defining characteristics of many nursing diagnoses, including the following:

- *Activity intolerance*
- *Anxiety*
- *Decreased cardiac output*
- *Deficient/excess fluid volume*
- *Impaired gas exchange*
- *Hyperthermia*
- *Hypothermia*
- *Acute pain*
- *Ineffective tissue perfusion*

The nursing care plan includes interventions specific for the nursing diagnosis identified and its related factors. For example, the defining characteristics of an abnormal heart rate,

exertional dyspnea, and a patient's verbal report of fatigue lead to a diagnosis of *activity intolerance*. When the related factor is "inactivity after a prolonged illness," interventions focus on increasing the patient's daily exercises. Evaluate patient outcomes by assessing the pulse rate, rhythm, strength, and equality after each intervention.

Respiration

Human survival depends on the ability of oxygen (O_2) to reach body cells and of carbon dioxide (CO_2) to be removed from the cells. **Respiration** is the mechanism that the body uses to exchange gases between the atmosphere and the blood and between the blood and the cells. Respiration involves **ventilation** (the movement of gases in and out of the lungs), **diffusion** (the movement of oxygen and carbon dioxide between the alveoli and the red blood cells), and **perfusion** (the distribution of red blood cells to and from the pulmonary capillaries). To analyze respiratory efficiency, assessment data must be integrated from all three processes. Ventilation is assessed by determining respiratory rate, respiratory depth, and respiratory rhythm. Diffusion and perfusion are assessed by determining oxygen saturation.

Physiological Control

Breathing is generally a passive process; a person thinks little about it. The respiratory centre in the brain stem regulates the involuntary control of respirations. Adults normally breathe in a smooth, uninterrupted pattern, 12 to 20 times a minute.

Ventilation is regulated by levels of carbon dioxide, oxygen, and hydrogen ion concentration (pH) in the arterial blood. The most important factor is the level of CO_2 in the arterial blood. An elevation in the CO_2 level causes the respiratory control system in the brain to increase the rate and depth of breathing. The increased ventilatory effort removes excess CO_2 (which is the state of hypercarbia) by increasing exhalation. However, patients with chronic lung disease have ongoing hypercarbia. For them, chemoreceptors in the carotid artery and aorta become sensitive to **hypoxemia**, or low levels of arterial O_2 . If arterial O_2 levels fall, these receptors signal the brain to increase the rate and depth of ventilation. Hypoxemia helps control ventilation in patients with chronic lung disease. Because low levels of arterial O_2 provide the stimulus that allows the patient to breathe, administration of high oxygen levels can be dangerous for these patients.

Mechanics of Breathing

Although breathing is normally passive, muscular work is involved in moving the lungs and chest wall. Inspiration is an active process. During inspiration, the respiratory centre sends impulses along the phrenic nerve, causing the diaphragm to contract. Abdominal organs move downward and forward, increasing the length of the chest cavity to move air into the lungs. The diaphragm moves approximately 1 cm, and the ribs retract upward from the body's midline approximately 1.2 to 2.5 cm. During a normal, relaxed breath, a person inhales 500 mL of air. This amount is referred to as the **tidal volume**. During expiration, the diaphragm relaxes and the abdominal organs return to their original positions. The lung and chest wall return to a relaxed position (Figure 30-10). In contrast to inhalation, expiration is a passive process. The normal rate and depth of ventilation, **eupnea**, is interrupted by sighing. The sigh, a prolonged deeper breath, is a protective physiological

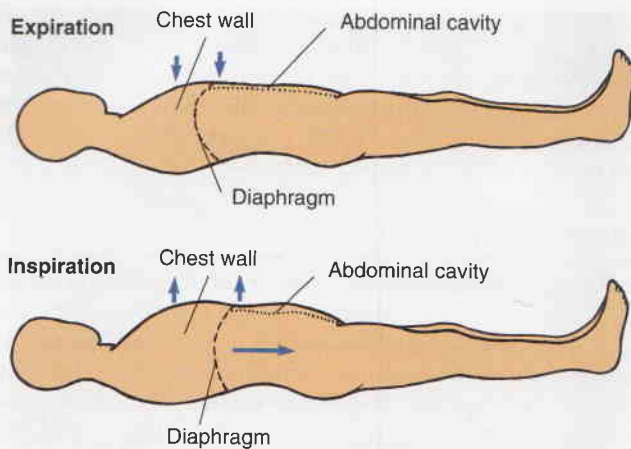


Figure 30-10 Illustration of diaphragmatic and chest wall movement during inspiration and expiration.

mechanism for expanding small airways and alveoli not ventilated during a normal breath.

The accurate assessment of respiration depends on the recognition of normal thoracic and abdominal movements. During quiet breathing, the chest wall gently rises and falls. Contraction of the accessory muscles of breathing (i.e., the intercostal muscles between the ribs and the muscles in the neck and shoulders) is not visible. During normal quiet breathing, diaphragmatic movement causes the abdominal cavity to rise and fall slowly.

Assessment of Ventilation

Special equipment is not needed to measure respirations, but measurement must not be haphazard. Accurate measurement requires observation and palpation of chest wall movement.

A sudden change in the character of respirations is important. Because respiration is tied to the function of numerous body systems, consider all variables when changes occur (Box 30-11). For example, abdominal trauma may injure the phrenic nerve, which is responsible for diaphragmatic contraction. The extent of the injury and the implications for the respiratory system are important to understand.

Try to not let the patient know that you are assessing his or her respiration. A patient aware of your intentions may consciously alter the rate and depth of breathing. The best time to measure respiration is immediately after measuring the pulse while your hand remains on the patient's wrist as it rests over the chest or abdomen. When assessing, keep in mind the patient's usual ventilatory rate and pattern, the influence any disease or illness has on respiratory function, the relationship between respiratory and cardiovascular function, and the influence of therapies on respiration. The objective measurements in assessing respiratory status include the rate and depth of breathing and the rhythm of ventilatory movements (Skill 30-3).

Respiratory Rate. Observe both inspiration and expiration when counting ventilation or respiration rate. The respiratory rate varies with age (Table 30-5) and usually decreases with age.

An apnea monitor is a respiratory monitoring device that aids in respiratory assessment. Leads that sense movement are attached to the patient's chest wall. Absence of chest wall movement triggers the apnea alarm. Apnea monitoring is used

BOX 30-11

Factors Influencing Character of Respiration

Exercise

Exercise increases respiratory rate and depth to meet body's need for additional O_2 and to rid body of CO_2 .

Acute Pain

Pain alters rate and rhythm of respiration; breathing becomes shallow.

Patient inhibits or splints chest wall movement when pain is in area of chest or abdomen.

Anxiety

Anxiety increases respiratory rate and depth as a result of sympathetic stimulation.

Smoking

Chronic smoking changes pulmonary airways, resulting in increased rate of respirations at rest when the person is not smoking.

Body Position

A straight, erect posture promotes full chest expansion.

A stooped or slumped position impairs ventilatory movement.

Lying flat prevents full chest expansion.

Medications

Opioids, general anaesthetics, and sedative hypnotics depress respiratory rate and depth.

Amphetamines and cocaine may increase respiratory rate and depth.

Bronchodilators slow respiratory rate by causing airway dilation.

Neurological Injury

Injury to the brain stem impairs the respiratory centre and inhibits respiratory rate and rhythm.

Hemoglobin Function

In the state of anemia, decreased hemoglobin levels reduce O_2 -carrying capacity of the blood, which results in increases in respiratory rate.

Increased altitude lowers the amount of saturated hemoglobin, which increases respiratory rate and depth.

Abnormalities in blood cell function (e.g., sickle cell disease) reduce ability of red blood cells to carry oxygen, which results in increases in respiratory rate and depth.

TABLE 30-5

Acceptable Ranges of Respiratory Rates by Age

Age	Rate (Breaths per Minute)
Newborn	30–60
Infant (6 months)	30–50
Toddler (2 years)	25–32
Child and preadolescent (3–12 years)	20–30
Adolescent (13–18 years)	16–19
Adult (older than 18 years)	12–20

frequently with infants in hospitals and at home to observe for prolonged apneic events.

Ventilatory Depth. Depth of respiration is assessed by observing the degree of excursion or movement in the patient's chest wall. Ventilatory movements can be described as "deep,"

► SKILL 30-3 Assessing Respirations

Delegation Considerations

The task of measuring respiration can be delegated to unregulated care providers (UCPs). The nurse is responsible for assessing for change in respiration rate, rhythm, and depth; therefore, when the task of measuring respiration is delegated, it is important to *inform the unregulated care provider* about the following:

- The patient's history or risk for abnormal respiratory status
- The frequency of respiration measurement for a specific patient
- Abnormalities that should be reported to the health care provider

Procedure

STEPS

1. Determine need to assess patient's respiration:
 - A. Note presence of risk factors for respiratory alterations.
 - B. Assess for signs and symptoms of respiratory alterations, such as bluish (cyanotic) appearance of nail beds, lips, mucous membranes, and skin; restlessness, irritability, confusion, and reduced level of consciousness; pain during inspiration; laboured or difficult breathing; adventitious breath sounds (see Chapter 31), inability to breathe spontaneously; thick, frothy, blood-tinged, or copious sputum produced on coughing.
2. Assess pertinent laboratory values.
 - A. **Arterial blood gases** (normal values may vary slightly between institutions):
 pH: 7.35–7.45 mm Hg
 PaCO₂: 35–45 mm Hg
 PaO₂: 80–100 mm Hg
 SaO₂: 95%–100%
 - B. **Pulse oximetry (SpO₂)**: Normal levels are 92%–100%; 85%–89% may be acceptable for certain chronic disease conditions; less than 85% is abnormal (see Skill 30-4).
 - C. **Specific tests of the complete blood cell count (CBC)**: (normal values for adults may vary between institutions and references consulted):
 Hemoglobin: 135–180 g/L in male patients; 120–160 g/L in female patients
 Hematocrit: 0.43–0.49 in male patients; 0.38–0.44 in female patients
 Red blood cell count: $4.7\text{--}5.74 \times 10^{12}/\text{L}$ in male patients; $4.2\text{--}4.87 \times 10^{12}/\text{L}$ in female patients
3. Determine previous baseline respiratory rate (if available) from patient's record.
4. Perform hand hygiene.
5. Draw curtain around patient's bed or close room door, or do both.

Equipment

- Watch with second hand or digital display
- Pen and either vital sign flow sheet or record form

RATIONALE

- You use clinical judgement to determine need for assessment.
- Conditions that heighten risk for alterations in ventilation—detected by changes in respiratory rate, depth, and rhythm—include fever, pain, anxiety, diseases of chest muscles, constrictive chest or abdominal dressings, gastric distension, chronic pulmonary diseases, traumatic chest injury, presence of a chest tube, respiratory infection, pulmonary edema and emboli, anemia, and head injury with damage to brain stem.
- Physical signs and symptoms indicate alterations in respiratory status related to ventilation.
- Arterial blood gases measure arterial blood pH partial pressure of O₂ (PaO₂) and CO₂ (PaCO₂), and arterial O₂ saturation (SaO₂), which reflects patient's oxygenation status.
- Although 95% is considered normal, 90% can be considered acceptable in patients with disorders such as sleep apnea. SpO₂ less than 85% is often accompanied by changes in respiratory rate, depth, and rhythm.
- Hemoglobin, hematocrit, and red blood cell count (three of several CBC tests) measure the concentration of hemoglobin volume of red blood cells, and red blood cell count, all of which reflect patient's capacity to carry O₂.
- Enables the ability to assess for changes in patient's condition and provides comparison with future respiratory measurements.
- Hand hygiene prevents transmission of microorganisms between the patient and the nurse.
- Drawing the curtain and closing the room door maintains patient's privacy, minimizes embarrassment, and promotes comfort.

Critical Decision Point: Patients with difficulty breathing (dyspnea), such as those with congestive heart failure, with abdominal ascites, or in late stages of pregnancy, should be assessed in the position of greatest comfort. Repositioning may increase the work of breathing, which increases respiratory rate.

6. Ensure patient is in comfortable position, preferably sitting or lying with the head of the bed elevated 45 to 60 degrees. Move bed linen or gown to be sure patient's chest is visible.
- Sitting erect promotes full ventilatory movement. A clear view of the chest wall and abdominal movements is needed for assessment.

Continued

> SKILL 30-3 Assessing Respirations—cont'd

7. Place patient's arm in relaxed position across his or her abdomen or lower chest, or place your hand directly over patient's upper abdomen (see Step 7 illustration).
- A similar position used during pulse assessment allows you to assess respiratory rate inconspicuously. Patient's hand or your hand rises and falls during respiratory cycle.



Step 7 Nurse's hand over patient's abdomen to check respiration.

8. Observe complete respiratory cycle (one inspiration and one expiration).
 9. After observing cycle, look at watch's second hand. When second hand reaches a number on watch dial, begin counting respiratory cycles, starting with "one" for the first full cycle, then "two," and so on.
 10. If rhythm is regular, count number of respiratory cycles in 30 seconds and multiply by 2. If rhythm is irregular, slower than 12 per minute, or faster than 20 per minute, count for 1 full minute.
 11. Note depth of respirations, which you subjectively assess by observing degree of chest wall movement while counting respiratory rate. You can also objectively assess respiratory depth by palpating patient's chest wall excursion or auscultating the posterior thorax after respiratory rate has been counted (see Chapter 31). Depth is described as "shallow," "normal," or "deep."
 12. Note rhythm of ventilatory cycle. Normal breathing is regular and uninterrupted. Sighing should not be confused with abnormal rhythm.
- You can determine rate accurately only after you have viewed patient's respiratory cycle.
 - Timing begins with count of one. Respirations occur more slowly than pulse.
 - Respiratory rate is equivalent to number of respiratory cycles per minute. Suspected irregularities necessitate assessment for at least 1 minute.
 - Character of ventilatory movement may reveal specific disease state restricting volume of air from moving into and out of the lungs.
 - Character of ventilations can reveal specific types of alterations. Without being aware of it, people periodically take single deep breaths or sighs to expand small airways prone to collapse.

Critical Decision Point: Any irregular respiratory pattern or period of apnea (the cessation of respiration for several seconds) in an adult is a symptom of underlying disease and must be reported to the prescribing health care provider or nurse in charge. Further assessment may be required (see Chapter 31), and immediate intervention may be needed. An irregular respiratory rate and short apneic spells are normal only in newborns.

13. Move back bed linen and patient's gown.
 14. Perform hand hygiene.
 15. Discuss findings with patient as needed.
 16. If patient's respiration is assessed for the first time, document rate, rhythm, and depth as baseline values.
 17. Compare respiration data with patient's previous baseline values and with normal values for rate, rhythm, and depth.
- This action restores patient's comfort and promotes sense of well-being.
 - Hand hygiene reduces transmission of microorganisms between patients.
 - Such discussion promotes patient's participation in care and understanding of health status.
 - These data are used for comparing data from future respiratory assessments.
 - These data allow you to assess for changes in patient's condition and for presence of respiratory alterations.

Unexpected Outcomes

Patient's respiratory rate is less than 12 (bradypnea) or more than 20 (tachypnea) breaths per minute, depth is increased or decreased, rhythm is irregular, or patient feels "short of breath"

Related Interventions

- Observe for related factors, including obstructed airway, abnormal breath sounds, productive cough, restlessness, irritability, anxiety, and confusion.
- Position patient in a supported sitting position (semi-Fowler's or high Fowler's), unless contraindicated.
- Provide oxygen as ordered.
- When possible, remove respiratory irritants from the environment, such as second-hand smoke and perfumes.

► SKILL 30-3 Assessing Respirations—cont'd

Recording and Reporting

- Record respiratory rate and character in nurses' notes or vital sign flow sheet. Indicate type and amount of oxygen therapy if it was used by the patient during assessment. Document respiratory rate in nurses' narrative notes after administration of specific therapies.
- Report abnormal findings to nurse in charge or to prescribing health care provider.

Home Care Considerations

- Assess for environmental factors in the home that may influence patient's respiration, such as second-hand smoke, poor ventilation, or gas fumes.

► TABLE 30-6 Alterations in Breathing Pattern

Alteration	Description
Bradypnea	Rate of breathing is regular but abnormally slow (<12 breaths per minute).
Tachypnea	Rate of breathing is regular but abnormally rapid (>20 breaths per minute).
Hyperpnea	Respirations are laboured, increased in depth, and increased in rate (>20 breaths per minute). This occurs normally during exercise.
Apnea	Respirations cease for several seconds and then resume. Persistent cessation results in respiratory arrest.
Hyperventilation	Rate and depth of respirations increase. Hypocarbica may occur.
Hypoventilation	Respiratory rate is abnormally low, and depth of ventilation may be depressed. Hypercarbica may occur.
Cheyne-Stokes respiration	Respiratory rate and depth are irregular, characterized by alternating periods of apnea and hyperventilation. Respiratory cycle begins with slow, shallow breaths that gradually increase to abnormal rate and depth. The pattern reverses, breathing slows and becomes shallow, climaxing in apnea before respiration resumes.
Kussmaul's respiration	Respirations are abnormally deep, regular, and increased in rate.
Biot's respiration	Respirations are abnormally shallow for two to three breaths, followed by irregular period of apnea.

“normal,” or “shallow.” A deep respiration involves full expansion of the lungs with full exhalation. Respirations are shallow when only a small quantity of air passes through the lungs and ventilatory movement is difficult to see. Objective techniques are used if chest excursion is unusually shallow (see Chapter 31). Table 30-6 summarizes breathing pattern alterations.

Ventilatory Rhythm. Breathing pattern can be determined by observing the chest or the abdomen. Diaphragmatic breathing results from the contraction and relaxation of the diaphragm and is best observed by watching abdominal movements. Healthy men and children usually demonstrate diaphragmatic breathing. Women tend to use thoracic muscles to breathe; therefore, movements are best observed in the upper chest. Laboured respirations involve use of the accessory muscles of respiration visible in the neck. When a foreign body interferes with the movement of air in and out of the lungs, the intercostal spaces in the rib cage retract during inspiration, indicating increased respiratory effort. A longer

expiration phase is evident when the outward flow of air is obstructed (e.g., as in asthma). In infants, additional indicators of respiratory distress are nasal flaring, grunting, and wheezing, making it important to look, listen, and feel when assessing breathing patterns in this population.

With normal breathing, a regular interval occurs after each respiratory cycle. Infants tend to breathe less regularly. The young child may breathe slowly for a few seconds and then suddenly breathe more rapidly. Estimate the time interval after each respiratory cycle. Respiration is regular or irregular in rhythm.

Assessment of Diffusion and Perfusion

To evaluate the respiratory processes of diffusion and perfusion, the oxygen saturation of the blood is measured. Blood flow through the pulmonary capillaries contains red blood cells for oxygen attachment. After oxygen diffuses from the alveoli into the pulmonary blood, most of the oxygen attaches to hemoglobin molecules in red blood cells. The red blood cells then carry the oxygenated hemoglobin molecules through the left side of the heart and out to the peripheral capillaries, where the oxygen detaches, depending on the needs of the tissues.

The percentage of hemoglobin that is bound with oxygen in the arteries is the percentage of saturation of hemoglobin (SaO₂). This value is usually between 95 and 100%. SaO₂ is affected by factors that interfere with ventilation, perfusion, or diffusion (see Chapter 38). The saturation of venous blood (SvO₂) is lower because the tissues have removed some of the oxygen from the hemoglobin molecules. A normal value for SvO₂ is 70%. SvO₂ is affected by factors that interfere with or increase the tissue's need for oxygen.

Measurement of Arterial Oxygen Saturation. A pulse oximeter permits the indirect measurement of oxygen saturation (Skill 30-4). This device contains a probe with a light-emitting diode (LED) and photo detector connected by cable to an oximeter (Figures 30-11 and 30-12). The LED emits light wavelengths that are absorbed differently by oxygenated and deoxygenated hemoglobin molecules. The photo detector detects the amount of oxygen bound to hemoglobin molecules; the oximeter calculates the pulse saturation (SpO₂).

The photo detector is in the oximeter probe. Select the appropriate probe to reduce measurement error. Digit probes are spring-loaded and conform to various sizes. Earlobe probes have greater accuracy at lower saturations and are least affected by peripheral vasoconstriction. Disposable sensor pads can be applied to a variety of sites, even the bridge of an adult's nose or the sole of an infant's foot. Factors that affect light transmission or peripheral arterial pulsations also affect the ability of the photo detector to measure SpO₂ (Box 30-12). Control of these factors allows accurate interpretation of abnormal SpO₂ measurements.

► SKILL 30-4 Measuring Oxygen Saturation (Pulse Oximetry)

video

Delegation Considerations

The task of measuring oxygen saturation can be delegated to unregulated care providers (UCPs). The nurse is responsible for assessing the effect of changes in oxygen saturation; therefore, when the task of measuring oxygen saturation is delegated, it is important to *inform the unregulated care provider* about the following:

- The importance of notifying the nurse immediately of any reading lower than SpO₂ of 90%
- How to select appropriate sensor site and probe for measurement of oxygen saturation
- The frequency of oxygen saturation measurements for the patient
- Factors that can falsely lower SpO₂ (see Box 30-12)

Procedure

STEPS

1. Determine need to measure patient's oxygen saturation:
 - A. Note risk factors, including acute or chronic compromised respiratory function; recovery from general anesthesia or monitored sedation; traumatic injury to chest; ventilator dependence; activity intolerance; and changes in supplemental oxygen therapy.
 - B. Assess for signs and symptoms such as altered respiratory rate, depth, or rhythm; adventitious breath sounds (see Chapter 31); cyanotic appearance of nail beds, lips, mucous membranes, and skin; restlessness, irritability, or confusion; reduced level of consciousness; and laboured or difficult breathing.
2. Assess for factors that normally influence measurement of SpO₂ (see Box 30-12), such as oxygen therapy, hemoglobin level, temperature, and medications (e.g., bronchodilators).
3. Review patient's medical record for pulse oximetry order, or consult agency policy or procedure manual for standard of care for measurement.
4. Determine site most appropriate for sensor probe placement (e.g., digit, earlobe) by assessing capillary refill (see Chapter 31) and skin condition. If capillary refill is less than 3 seconds, choose another site.
 - A. Site needs to have adequate circulation and be free of moisture.
 - B. If peripheral digit is selected, it must be free of polish or artificial nail.
 - C. If tremors are present, use earlobe as site.
 - D. If patient is obese, clip-on probe may not fit; obtain a single-use tape-on probe.
5. Determine previous baseline SpO₂ (if available) from patient's record.
6. Explain purpose of procedure to patient and how oxygen saturation will be measured.
7. Perform hand hygiene.
8. Position patient comfortably. If finger is chosen as monitoring site, support patient's lower arm.
9. Use acetone to remove any fingernail polish from digit to be assessed.

Equipment

- Oximeter
- Oximeter probe appropriate for patient and recommended by manufacturer
- Acetone or nail polish remover, if needed
- Pen and either vital sign flow sheet or documentation form

RATIONALE

- Clinical judgement is used to determine need for assessment.
- Certain conditions heighten risk for decreased oxygen saturation.
- Physical signs and symptoms may be indicative of abnormal oxygen saturation.
- This assessment enables you to accurately assess oxygen saturation variations. Peripheral vasoconstriction related to hypothermia can interfere with SpO₂ determination.
- Medical order may be needed to assess oxygen saturation.
- Sensor requires pulsating vascular bed to identify hemoglobin molecules that absorb emitted light. Changes in SpO₂ are reflected in the circulation of the finger capillary bed within 30 seconds and the capillary bed of earlobe within 5–10 seconds. Moisture prevents the sensor from detecting SpO₂ levels. Artificial nails and nail polish colours alter readings. Motion artifact is the most common cause of a false reading.
- Nail polish interferes with accuracy of readings. Opaque coatings decrease light transmission; nail polish containing blue pigment can absorb light emissions and falsely alter saturation measurement.
- Baseline information provides basis for comparison and assists in assessment of current status and evaluation of interventions.
- Explaining procedures promotes patient's cooperation and increases compliance.
- Hand hygiene reduces transmission of microorganisms between the patient and the nurse.
- This positioning enables probe positioning and decreases motion artifact that interferes with SpO₂ determination.
- Nail polish can interfere with accuracy of readings. Opaque coatings decrease light transmission; polish containing blue pigment can absorb light emissions and falsely alter oximetry measurements.

SKILL 30-4 Measuring Oxygen Saturation (Pulse Oximetry)—cont'd

10. Instruct patient to breathe normally.
 11. Attach sensor probe to monitoring site. Inform patient that clip-on probe feels like a clothespin on the finger but will not hurt.
- Normal breathing prevents large fluctuations in respiratory rate and depth and prevents possible errors in SpO₂ reading.
 - To avoid startling patient, prepare patient to feel pressure of sensor probe's spring tension on a peripheral digit or earlobe.

Critical Decision Point: Do not attach probe to finger, ear, or bridge of nose if area is edematous or skin integrity is compromised. Do not attach probe to hypothermic fingers. Select ear or bridge of nose if adult patient has history of peripheral vascular disease. Do not use sensors on earlobe and bridge of nose in infants and toddlers because of skin fragility. Do not use disposable adhesive probes if patient has latex allergy. Do not place probe on same extremity as electronic blood pressure cuff because blood flow to finger is temporarily interrupted when cuff inflates; this results in inaccurate readings that trigger alarms.

12. Once sensor is in place, turn on oximeter. Observe pulse waveform and intensity display, and listen for audible beep. Correlate oximeter pulse rate with patient's radial pulse. Oximeter pulse rate and patient's radial pulse should be the same. If differences are present, re-evaluate oximeter probe placement, and reassess pulse rates.
 13. Leave probe in place until oximeter readout reaches constant value and pulse display reaches full strength during each cardiac cycle. Inform patient that oximeter alarm will sound if probe falls off or if patient moves probe. Read SpO₂ on digital display.
 14. If SpO₂ monitoring is to be continuous, verify SpO₂ alarm limits and alarm volume, which are preset by the manufacturer at a minimum of 85% and a maximum of 100%. Determine limits for SpO₂ and pulse rate alarms on the basis of each patient's condition. Verify that alarms are functional. Assess skin integrity under sensor probe every two hours. Relocate sensor probe at least every 4 hours and more frequently if skin integrity is altered or tissue perfusion compromised.
 15. Assist patient to return to comfortable position.
 16. Perform hand hygiene.
 17. Discuss findings with patient as needed.
 18. If SpO₂ measurements are intermittent or spot-checked, remove probe and turn oximeter power off between measurements. Store probe in appropriate location.
 19. Compare SpO₂ readings with patient's baseline and acceptable values.
 20. Correlate SpO₂ with SaO₂ obtained from arterial blood gas measurements (see Chapter 39) if available.
 21. Correlate SpO₂ reading with data obtained from assessment of respiratory rate, depth, and rhythm (see Skill 30-3).
- Pulse waveform and intensity display enables detection of valid pulse to SpO₂ value. Double-checking pulse rate ensures oximeter accuracy.
 - Reading takes 10 to 30 seconds, depending on site selected.
 - Alarms must be set at appropriate limits and volumes to avoid frightening patients and visitors.
 - Spring tension of sensor probe or sensitivity to disposable sensor probe adhesive can cause skin irritation and lead to disruption of skin integrity.
 - This action restores patient's comfort and promotes sense of well-being.
 - Hand hygiene reduces transmission of microorganisms between the patient and the nurse.
 - Such discussion promotes patient's participation in care and understanding of health status.
 - Batteries will be depleted if oximeter is left on. Sensor probes are expensive and vulnerable to damage.
 - Comparison reveals presence of abnormality.
 - Reliability of noninvasive assessments is documented.
 - Measurements of ventilation, perfusion, and diffusion are interrelated.

Unexpected Outcomes

SpO₂ is less than 90%

Pulse rate indicated on oximeter is lower than patient's radial or apical pulse

Related Interventions

- Verify that oximeter probe is intact and that outside light transmission does not influence measurement.
- Observe for signs associated with decreased oxygenation (e.g., anxiety, restlessness, tachycardia, cyanosis).
- Verify that supplemental oxygen delivery system is delivered as ordered and is functioning properly.
- Minimize factors that alter SpO₂ (e.g., lung secretions, increased activity, hyperthermia).
- Position patient to promote optimal ventilation (e.g., high Fowler's position for obese patient).
- Reposition sensor probe to alternative site with increased blood flow.
- Assess patient for signs of altered cardiac output (e.g., decreased blood pressure, cool skin, confusion).

Continued

► SKILL 30-4 Measuring Oxygen Saturation (Pulse Oximetry)—cont'd

video

Recording and Reporting

- Record SpO₂ value on nurses' notes or vital sign flow sheet, indicating type and amount of oxygen therapy used by patient during assessment. Record any signs and symptoms of oxygen desaturation in nurses' narrative notes. Report abnormal findings to nurse in charge or prescribing health care provider.
- Document SpO₂ in nurses' narrative notes after administration of specific therapies.
- Record in nurses' notes patient's use of continuous or intermittent pulse oximetry.

Home Care Considerations

- Pulse oximetry is used in home care to noninvasively monitor oxygen therapy or changes in oxygen therapy.
- Instruct caregivers to examine oximeter site before applying sensor.
- Instruct caregivers on procedure to implement when oxygen saturation not within acceptable values.



Figure 30-11 Portable pulse oximeter. **Source:** Ignatavicius, D. D., & Workman, M. L. (2013). *Medical-surgical nursing: Patient-centered collaborative care* (7th ed., p. 558, Fig. 29-12). St Louis, MO: Mosby.



Figure 30-12 Spring tension oximeter probe **Source:** Forbes, C. D. & Jackson, W. F. (2003). *Color atlas and text of clinical medicine* (3rd ed., p. 153, Fig. 4.22). Edinburgh: Mosby.

Nursing Process and Respiratory Vital Signs

Measurements of respiratory rate, pattern, and depth, along with SpO₂, enable the assessment of ventilation, diffusion, and perfusion. Other assessments also involve respiratory status (see Chapter 31). Each measurement provides clues in determining the nature of a patient's problem. Respiratory

► BOX 30-12 Factors Affecting Determination of Pulse Oxygen Saturation (SpO₂)

Interference with Light Transmission

Outside light sources interfere with oximeter's ability to process reflected light.

Carbon monoxide (caused by smoke inhalation or poisoning) artificially elevates SpO₂ by absorbing light in a similar way that oxygen does.

Patient motion interferes with oximeter's ability to process reflected light.

Jaundice interferes with oximeter's ability to process reflected light.

Intravascular dyes (e.g., methylene blue) absorb light in a similar way that deoxyhemoglobin does and artificially lower saturation.

Nail polish, artificial nails, and metal studs in nails interfere with light absorption and the ability of the oximeter to process reflected light.

Dark skin pigment sometimes results in signal loss or overestimation of saturation.

Reduction of Arterial Pulsations

Peripheral vascular disease (atherosclerosis) reduces pulse volume.

Hypothermia at assessment site decreases peripheral blood flow.

Pharmacological vasoconstrictors (epinephrine, dopamine) decrease peripheral pulse volume.

Low cardiac output and hypotension decrease blood flow to peripheral arteries.

Peripheral edema obscures arterial pulsation.

Tight probe records venous pulsations in the finger that compete with arterial pulsations.

assessment data are defining characteristics of many nursing diagnoses, including the following:

- *Activity intolerance*
- *Ineffective airway clearance*
- *Anxiety*
- *Ineffective breathing pattern*
- *Impaired gas exchange*
- *Acute pain*
- *Ineffective tissue perfusion*
- *Dysfunctional ventilatory weaning response*

The nursing care plan includes interventions specific for the nursing diagnosis identified and the related factors. For example, the defining characteristics of tachypnea, changes in depth of respirations, use of accessory muscles, cyanosis, and a decline in SpO₂ lead to a diagnosis of *impaired gas exchange*. Related factors may include lung surgery, history of chronic

obstructive lung disease, and history of heavy smoking. Evaluate patient outcomes by assessing the respiratory rate, ventilatory depth, rhythm, and SpO₂ after each intervention.

Blood Pressure

Blood pressure is the force exerted on the walls of an artery by the pulsing blood under pressure from the heart. Blood flows throughout the circulatory system because of pressure changes. It moves from an area of high pressure to an area of low pressure. Systemic or arterial blood pressure (the blood pressure in the system of arteries in the body) is a good indicator of cardiovascular health. The heart's contraction forces blood under high pressure into the aorta. The peak of maximum pressure when ejection occurs is the **systolic** blood pressure. When the ventricles relax, the blood remaining in the arteries exerts **diastolic** blood pressure, which is the minimal pressure exerted against the arterial walls at any time.

The standard unit for measuring blood pressure is millimetres of mercury (mm Hg). The measurement indicates the height to which the blood pressure can raise a column of mercury. It is recorded as the systolic reading over the diastolic reading (e.g., 120/80). The difference between systolic and diastolic pressure is the **pulse pressure**. For a blood pressure of 120/80, the pulse pressure is 40. This parameter has been recently considered as a potential indicator of cardiovascular disease, given its relationship to compliance or stiffening of the arteries.

Physiology of Arterial Blood Pressure

Blood pressure reflects the interrelationships of cardiac output, peripheral vascular resistance, blood volume, blood viscosity, and artery elasticity. Knowledge of these hemodynamic variables helps in the assessment of blood pressure alterations.

Cardiac Output. Blood pressure depends on cardiac output. When volume increases in an enclosed space, such as a blood vessel, the pressure in that space rises. As cardiac output increases, more blood is pumped against arterial walls, causing the blood pressure to rise. Cardiac output increases as a result of an increase in heart rate, greater heart muscle contractility, or an increase in blood volume. Changes in heart rate can occur faster than changes in heart muscle contractility or blood volume. A rapid or significant increase in heart rate decreases the heart's ability to fill, resulting in blood pressure decreasing.

Peripheral Resistance. Blood pressure depends on peripheral vascular resistance. Blood circulates through a network of arteries, arterioles, capillaries, venules, and veins. Arteries and arterioles are surrounded by smooth muscle that contracts or relaxes to change the size of the lumen. Normally, arteries and arterioles remain partially constricted to maintain a constant flow of blood. The size of arteries and arterioles changes to adjust blood flow to the needs of local tissues. For example, when a major organ requires more blood, the peripheral arteries constrict, decreasing their supply of blood. More blood then becomes available to the major organ because of the resistance change in the periphery. Peripheral vascular resistance is the resistance to blood flow determined by the tone of the vascular musculature and diameter of blood vessels. The smaller the lumen of a vessel, the greater the resistance to blood flow. As resistance rises, arterial blood pressure rises. As vessels dilate and resistance falls, blood pressure subsequently decreases.

Blood Volume. The volume of blood circulating within the vascular system affects blood pressure. Most adults have a circulating blood volume of approximately 5000 mL. Normally, this blood volume remains constant. However, if volume increases, more pressure is exerted against arterial walls. For example, the rapid, uncontrolled infusion of intravenous fluids would typically increase blood pressure. When circulating blood volume decreases, as with hemorrhage or dehydration, blood pressure would subsequently decrease.

Viscosity. The thickness or viscosity of blood affects the ease with which blood flows through the small vessels. The **hematocrit**, or percentage of red blood cells in the blood, determines blood viscosity. When the hematocrit rises and blood flow slows, the heart must contract more forcefully to move the viscous blood through the circulatory system. This results in arterial blood pressure increasing.

Elasticity. Normally, the walls of an artery are elastic and easily distensible. As pressure within the arteries increases, the diameter of the vessel walls increases to accommodate the rising pressure change. Arterial distensibility prevents wide fluctuations in blood pressure. However, in certain diseases, such as arteriosclerosis, vessel walls lose their elasticity and are replaced by fibrous tissue that cannot stretch as well. With reduced elasticity, resistance to blood flow is greater. As a result, when the left ventricle ejects its stroke volume, the vessels no longer yield to pressure. Instead, a given volume of blood is forced through the rigid arterial walls, and systemic pressure rises. Systolic pressure is more significantly elevated than diastolic pressure as a result of reduced arterial elasticity.

Most importantly, each hemodynamic factor significantly affects the others. For example, as arterial elasticity declines, peripheral vascular resistance increases. The complex control of the cardiovascular system normally prevents any single factor from permanently changing the blood pressure. For example, if the blood volume falls, the body compensates with increased vascular resistance.

Factors Influencing Blood Pressure

Blood pressure is not constant; it is continually influenced by many factors. One measurement cannot adequately reflect a patient's blood pressure. Blood pressure changes from heart-beat to heartbeat. Blood pressure trends, not individual measurements, guide nursing interventions. By understanding these factors, you can more accurately interpret blood pressure readings.

Age. Normal blood pressure levels vary throughout life. Blood pressure increases during childhood. The level of a child's or adolescent's blood pressure is assessed with regard to body size and age. An infant's systolic blood pressure ranges from 65 to 115 systolic, and the diastolic pressure ranges from 42 to 80. The normal systolic blood pressure for a seven-year-old is 87 to 117, and the normal diastolic pressure is 48 to 64. Larger children (heavier and/or taller) have higher blood pressures than do smaller children of the same age. During adolescence, blood pressure continues to vary according to body size.

An adult's blood pressure tends to increase with advancing age. Canadian guidelines indicate that blood pressure should be assessed at all appropriate health care visits. Blood pressure should be treated to lower than 140/90 mm Hg. In those people with diabetes or chronic kidney disease, blood pressure should be treated to below 130/80 mm Hg. Those with high normal blood pressure should be followed up annually to assess for risk of early onset hypertension (Canadian Hypertension

TABLE 30-7

Classification of Blood Pressure for Adults Aged 18 and Older

Category	Systolic Pressure (mm Hg)	Diastolic Pressure (mm Hg)
Optimal	<120	<80
Normal	<130	<85
High normal	130–139	85–89
Grade 1 hypertension	140–159	90–99
Grade 2 hypertension	160–179	100–109
Grade 3 hypertension	≥180	≥110
Isolated systolic hypertension)	>140	<90

Adapted from Canadian Hypertension Education Program. (2008).

Recommendations for the management of hypertension, Part 1: Hypertension as a public health risk. Retrieved from <http://www.hypertension.ca/chep/educational-resources/slides> (Introduction Slide 5).

To keep up to date with the latest evidence and resources for the prevention and control of hypertension, go to <http://www.htnupdate.ca>.

Education Program, 2011; Table 30-7). Older adults may have a rise in systolic pressure that is related to decreased vessel elasticity; however, blood pressure higher than 140/90 is defined as **hypertension** and increases an older adult's risk for hypertension-related illness.

Stress. Anxiety, fear, pain, and other emotional stress results in stimulation of the sympathetic nervous system, which increases heart rate, cardiac output, and peripheral vascular resistance. These alterations, in turn, increase blood pressure. Anxiety can raise blood pressure by as much as 30 mm Hg.

Ethnicity. The incidence of hypertension is higher among ethnic groups such as South Asian, Aboriginal, and Black Canadians. Genetic and environmental factors are believed to be contributing factors (Heart & Stroke Foundation, 2011).

Gender. Males and females do not have clinically significant differences in blood pressure levels. After puberty, boys tend to have higher blood pressure readings. After menopause, women tend to have higher levels of blood pressure than do men of similar ages.

Daily Variation. Blood pressure varies over the course of a day. In people who are active during the day, it is typically lowest during sleep between midnight and 0300 hours (Jones et al., 2006). Between 0300 and 0600 hours, blood pressure rises steadily. Upon awakening, blood pressure surges (Redon, 2004). Blood pressure is highest between 1000 and 1800 hours (Redon, 2004). No two people have the same pattern or degree of variation.

Medications. During blood pressure assessment, it is important to determine if the patient is on any type of medications as some can directly or indirectly affect blood pressure. Antihypertensive or other cardiac medications may lower blood pressure (Table 30-8). Opioid analgesics can lower blood pressure. Vasoconstrictors and an excess of intravenous fluids can increase blood pressure.

Activity, Weight, and Smoking. Blood pressure can be reduced for several hours after a period of exercise. Older adults often experience a 5- to 10-mm Hg fall in blood pressure about one hour after eating. Increases in oxygen demanded by the body during activity leads to increases in blood pressure. Obesity is a factor in hypertension. Smoking results in vasoconstriction. Blood pressure rises when a person is smoking, and it returns to baseline 15 minutes after smoking ceases.

TABLE 30-8

Antihypertensive Medications

Medication Type	Names	Action
Diuretics	Furosemide (Lasix), spironolactone (Aldactone), metolazone, polythiazide, triamterene (Dyazide)	Reduce kidneys' reabsorption of sodium and water, thus lowering circulating fluid volume.
β-Adrenergic blockers	Atenolol (Tenormin), nadolol (Corgard), timolol maleate (Blocadren), propranolol (Inderal)	Combine with β-adrenergic receptors in the heart, arteries, and arterioles to block response to sympathetic nerve impulses; this results in reduced heart rate and thus cardiac output.
Vasodilators	Hydralazine hydrochloride (Apresoline), minoxidil (Loniten)	Act on arteriolar smooth muscle to cause relaxation and reduce peripheral vascular resistance.
Calcium channel blockers	Diltiazem (Cardizem), Dilacor XR), verapamil hydrochloride (Calan SR), nifedipine (Procardia)	Reduce peripheral vascular resistance by systemic vasodilation.
Angiotensin-converting enzyme (ACE) inhibitors	Ramipril (Altace), captopril (Capoten), enalapril (Vasotec), lisinopril (Prinivil, Zestril), benazepril (Lotensin)	Block the conversion of angiotensin I to angiotensin II, which prevents vasoconstriction; also reduces aldosterone production and fluid retention, thereby lowering circulating fluid volume.
Angiotensin II receptor blockers	Losartan (Cozaar), olmesartan (Benicar)	Block the binding of angiotensin II, which prevents vasoconstriction.

Hypertension

The most common alteration in blood pressure is hypertension. Hypertension is often asymptomatic. The diagnosis of high normal blood pressure in adults is made when, on at least two visits to a health care provider after an initial high reading, an average of three or more diastolic readings is between 85 and 89 mm Hg or when the average of multiple systolic blood pressures on two or more subsequent visits is between 130 and 139 mm Hg. Hypertension is noted with diastolic readings higher than 90 mm Hg and systolic readings

BOX 30-13 NURSING STORY

White Coat Hypertension

Between the ages of 45 and 49, my neighbour, M. J., had a blood pressure reading of approximately 140/85 during her annual check-ups. After each visit, I informed her that she may have white coat hypertension and recommended that she monitor her blood pressure at home because individuals who have white coat hypertension are at risk of developing true hypertension. I advised her to reduce her sodium dietary intake and to exercise regularly; she did not drink alcohol. I monitored her blood pressure at home; results were all below 135/85. At her annual checkup after her 50th birthday, her blood pressure was 140/86; at a follow-up visit two months later, it was 142/88. During that time, her blood pressure at home ranged between 136 and 140 (systolic) and 82 and 86 (diastolic). She went to the hypertension clinic to have a 24-hour blood pressure monitor applied. I informed her that this test would provide the physician with information to make treatment decisions. Because of high readings during the test, Dyzide (triamterene), 25 mg daily, was prescribed. I continued to monitor her blood pressure at home, but because her results remained in the hypertensive range, enalapril (Vasotec) 2.5 mg was added to her blood pressure drug regimen at her next visit four months later. Since then, all of her blood pressure readings, both at home and in the physician's office, have been below 126 (systolic) and 82 (diastolic). Four years later, M. J.'s blood pressure continues to be controlled.

higher than 140 mm Hg (Canadian Hypertension Education Program, 2011). Categories of hypertension have been developed and are used to determine medical intervention (see Table 30-7). One elevated blood pressure measurement does not qualify as a diagnosis of hypertension. However, if an elevated reading (e.g., 150/90 mm Hg) is obtained during the first blood pressure measurement, two subsequent readings should be taken. The first reading is discarded and the additional readings are then averaged. If results remain elevated, further medical follow-up is required. Home measurement of blood pressure is an important facet in the diagnosis of white coat hypertension and masked hypertension (Canadian Hypertension Education Program, 2011). In **white coat hypertension**, blood pressure is elevated during a visit to a health care provider. Affected patients are more likely to develop true hypertension over time. In **masked hypertension**, the blood pressure reading is normal while the patient is with a health care provider but becomes elevated at home (Canadian Hypertension Education Program, 2011). Box 30-13 describes a nursing example.

Hypertension is associated with thickening and loss of elasticity in the arterial walls. Peripheral vascular resistance increases within thick, inelastic vessels. The heart must continually pump against greater resistance. As a result, blood flow to vital organs such as the heart, brain, and kidney decreases.

People with a family history of hypertension are at significant risk for developing hypertension and cardiovascular disease. Modifiable risk factors linked to hypertension include obesity, cigarette smoking, heavy alcohol consumption, high sodium (salt) intake, sedentary lifestyle, and continued exposure to stress. The incidence of hypertension is higher among people with diabetes, among older adults, and in some ethnic groups. It is a major factor underlying deaths from strokes and is a factor contributing to myocardial infarctions (heart

attacks). When hypertension is diagnosed, educate the patient about blood pressure values, long-term follow-up care and therapy, the usual lack of symptoms (the fact that it may not be “felt”), the ability of therapy to control but not cure hypertension, and the importance of consistently following a treatment plan to ensure a relatively normal lifestyle (Canadian Hypertension Education Program, 2011).

Hypotension

Hypotension is considered present when the systolic blood pressure decreases to 90 mm Hg or lower. Some adults may have a low blood pressure normally; however, for the majority of people, low blood pressure is an abnormal finding associated with illness.

Hypotension occurs because of the dilation of the arteries in the vascular bed, the loss of a substantial amount of blood volume (e.g., hemorrhage), or the failure of the heart muscle to pump adequately (e.g., myocardial infarction). Hypotension associated with pallor, skin mottling, clamminess, confusion, increased heart rate, or decreased urine output is life-threatening and should be reported to a prescribing health care provider immediately.

Orthostatic hypotension, also referred to as **postural hypotension**, occurs when a normotensive person (a person with normal blood pressure) develops symptoms of low blood pressure when rising to an upright position. When a healthy individual changes from lying down to a sitting or standing position, the peripheral blood vessels in the legs constrict. Vasoconstriction in the lower extremities during standing prevents the pooling of blood in the legs caused by gravity. Thus, no symptoms are normally felt when standing. In contrast, when patients have a decreased blood volume, their blood vessels are already constricted. When a volume-depleted patient stands, blood pressure drops significantly, and heart rate increases to compensate for the drop in cardiac output. Patients who are dehydrated, are anemic, or have experienced prolonged bed rest or recent blood loss are at risk for orthostatic hypotension.

Assess for orthostatic hypotension during vital sign measurements by obtaining blood pressure and pulse with the patient supine, sitting, and standing. The readings are obtained one to three minutes after the patient changes position. In most cases, orthostatic hypotension is detected within a minute of standing up. If it occurs, assist the patient to a lying position and notify the prescribing health care provider or nurse in charge. While obtaining orthostatic measurements, observe for other symptoms of hypotension such as fainting, weakness, or light-headedness. When recording orthostatic blood pressure measurements, record the patient's position, in addition to the blood pressure measurement: for example, “140/80 supine, 132/72 sitting, 108/60 standing.” Because the skill of orthostatic measurements requires advanced reasoning and ongoing nursing judgement, *do not delegate this procedure* to unregulated care providers.

Measurement of Blood Pressure

Arterial blood pressure may be measured either directly (invasively) or indirectly (noninvasively). The direct method requires the insertion of a thin catheter into an artery. Tubing connects the catheter to electronic monitoring equipment. The monitor displays a constant arterial pressure waveform and reading. Because of the risk of sudden blood loss from an artery, invasive blood pressure monitoring is used only in

intensive care settings. The more common noninvasive method requires use of the sphygmomanometer and stethoscope. Measure blood pressure indirectly by auscultation or palpation. Auscultation is the most widely used technique (Skill 30-5).

Blood Pressure Equipment. Before assessing blood pressure, make sure that you know how to use a sphygmomanometer and stethoscope. A **sphygmomanometer** includes a pressure manometer, an occlusive cloth or vinyl cuff that encloses an inflatable rubber bladder, and a pressure bulb with

Text continued on p. 528

► SKILL 30-5 Measuring Blood Pressure



Delegation Considerations

In most provinces and territories, the task of measuring blood pressure can be delegated to unregulated care providers (UCPs). The nurse is responsible for assessing changes in blood pressure; therefore, when the task of measuring blood pressure is delegated, it is important to *inform the unregulated care provider* about the following:

- Selection of appropriate limb for blood pressure measurement—typically the arm, but can also be measured on leg
- Selection of appropriate-size blood pressure cuff for designated extremity
- Frequency of blood pressure measurement for patient
- Patient's usual values
- Abnormalities that should be reported to the health care provider

Procedure

STEPS

1. Determine need to assess patient's blood pressure:
 - A. Note risk factors for alteration in blood pressure, including cardiovascular disease, renal disease, diabetes, circulatory shock, acute or chronic pain, rapid intravenous infusion of fluids or blood products, increased intracranial pressure, postoperative conditions, and toxemia of pregnancy.
 - B. Observe for signs and symptoms of blood pressure alterations.
 - (1) High blood pressure (hypertension): headache (usually occipital), flushing of face, nosebleed, and fatigue (older adults); often asymptomatic until pressure is very high
 - (2) Low blood pressure (hypotension): dizziness, mental confusion; restlessness; pale, dusky, or cyanotic skin and mucous membranes; and cool, mottled skin over extremities
2. Determine best site for blood pressure assessment. Avoid applying cuff to extremity where intravenous fluids are infusing; where an arteriovenous shunt or fistula is present; on the side where breast or axillary surgery has been performed; and when extremity has been traumatized, is diseased, or requires a cast or bulky bandage. Use lower extremities when the brachial arteries are inaccessible.
3. Determine previous baseline blood pressure (if available) from patient's record.
4. Identify factors likely to interfere with accuracy of blood pressure measurement (e.g., acute anxiety, stress, pain). Encourage patient to avoid caffeine, smoking, and nicotine for 60 minutes before blood pressure is assessed (Canadian Hypertension Education Program, 2011).
5. Explain to patient that blood pressure is to be assessed, and have patient rest at least 5 minutes before blood pressure is measured in sitting or lying position; wait 1 minute if patient is standing. Ask patient not to speak when blood pressure is being measured.

Equipment

- Aneroid sphygmomanometer
- Cloth or disposable vinyl pressure cuff of appropriate size for patient's extremity
- Stethoscope
- Alcohol swab
- Pen and either vital sign flow sheet or documentation form

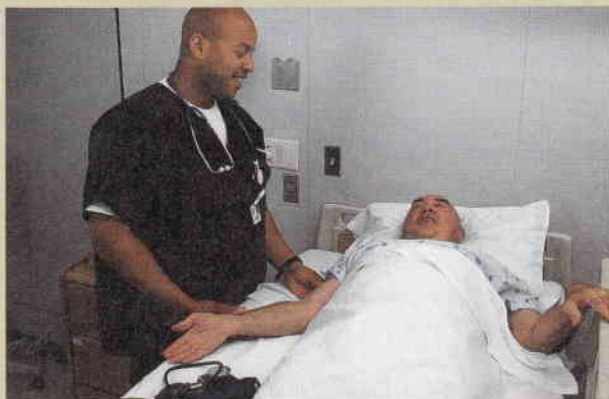
RATIONALE

- Use clinical judgement to determine need for assessment.
- Certain conditions heighten risk for blood pressure alteration.
- Physical signs and symptoms may indicate alterations in blood pressure.
- Inappropriate site selection results in poor amplification of sounds causing inaccurate readings. Application of pressure from inflated cuff bladder temporarily impairs blood flow and can exacerbate existing impairment of circulation in extremity.
- Baseline measurement enables the assessment of change in patient's condition and provides comparison with future blood pressure measurements.
- Exercise and smoking cause false elevations in blood pressure. Smoking increases blood pressure immediately, with the effect lasting up to 15 minutes. Caffeine (e.g., in coffee) increases blood pressure for up to 3 hours.
- These preparations allow patient to relax and help avoid falsely elevated readings. Blood pressure readings taken at different times can be objectively compared with readings taken with patient at rest. Talking to a patient when the blood pressure is being assessed may increase readings (Canadian Hypertension Education Program, 2011).

► SKILL 30-5 Measuring Blood Pressure—cont'd

[video](#)

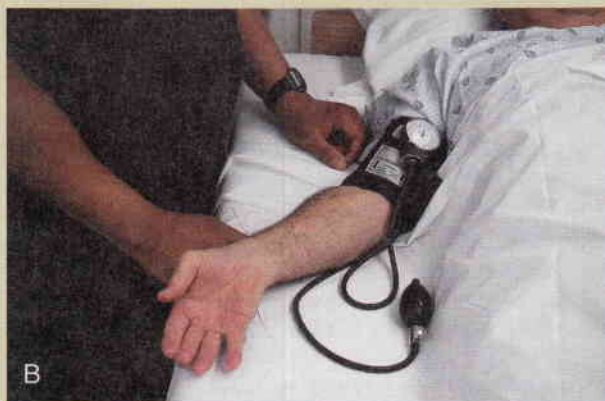
6. Select appropriate cuff size.
 7. Ensure proper functioning of cuff components: release valve should be clean and freely movable in either direction; inflation bulb and tubing should be intact and free of leaks.
 8. Perform hand hygiene.
 9. Have patient assume sitting or lying position. Be sure room is warm, quiet, and relaxing.
 10. With patient sitting or lying, position patient's forearm at heart level; position patient's thigh flat (provide support as needed). To measure at patient's arm, turn palm up (see Step 10 illustration); to measure at patient's thigh, position with knee slightly flexed. If patient is sitting, instruct patient to sit with feet touching floor without crossing legs (Canadian Hypertension Education Program, 2011).
 11. Expose patient's extremity (arm or leg) fully by removing constricting clothing.
 12. Palpate patient's brachial artery (arm; see Step 12a illustration) or popliteal artery (leg). With cuff fully deflated, apply bladder of cuff above artery by centring cuff over artery. If no centre arrows appear on the cuff, estimate the centre of the bladder and place this centre over artery. Position cuff 2.5 cm above site of pulsation (antecubital or popliteal space). Wrap cuff evenly and snugly around extremity (see Step 12b illustrations). Do not place blood pressure cuff over clothing.
- Improper cuff size results in inaccurate readings. If cuff is too small or comes loose when inflated, this may result in falsely high readings. A cuff that is too large may produce falsely low readings.
 - Improper functionality results in difficulty with regulation of cuff inflation and deflation.
 - Hand hygiene reduces transmission of microorganisms between the patient and the nurse.
 - These actions maintain patient's comfort during measurement. The patient's perceptions that the physical or interpersonal environment is stressful affect the blood pressure measurement.
 - If extremity is unsupported, patient may perform isometric exercise that increases diastolic blood pressure. Leg crossing falsely elevates blood pressure.
 - Exposure ensures proper cuff application.
 - Inflating bladder directly over artery ensures that proper pressure is applied during inflation. Loose-fitting cuff causes false high readings.



Step 10 Patient's forearm supported in bed.



Step 12a Palpating patient's brachial or popliteal artery.



Step 12b Left, Bladder of cuff centred above artery. Right, Blood pressure cuff wrapped around upper arm.

Continued

► SKILL 30-5 Measuring Blood Pressure—cont'd

video

13. Position aneroid manometer gauge no further than 1 metre away.

14. Measure blood pressure.

A. Two-step method

- (1) Relocate patient's brachial or popliteal pulse. Palpate the artery distal to the cuff with fingertips of nondominant hand while inflating cuff rapidly to pressure 30 mm Hg above the point at which the pulse disappears. Slowly deflate cuff, and note reading when the pulse reappears. Deflate cuff fully and wait 1 minute.
- (2) Place stethoscope earpieces in your ears, and be sure sounds are clear, not muffled.
- (3) Relocate patient's brachial or popliteal pulse and place bell or diaphragm chest piece of stethoscope over it. Do not allow chest piece to touch cuff or clothing (see Steps 14A[3] illustration).
- (4) Close valve of pressure bulb clockwise until it is tight.
- (5) Rapidly inflate cuff to 30 mm Hg above previously palpated systolic pressure (patient's estimated systolic pressure; see Step 14A[5] illustration).



Step 14A(3) Stethoscope over brachial artery to measure blood pressure.

- (6) Slowly release pressure bulb valve, and allow needle of manometer gauge to fall at rate of 2–3 mm Hg/second. Make sure no extraneous sounds are audible.
- (7) Note point on manometer when first clear sound is heard. The sound will slowly increase in intensity.
- (8) Continue to deflate cuff, noting point at which sound becomes muffled or dampened.
- (9) Continue to deflate cuff gradually, noting point at which sound disappears in adults. Listen for 10–20 mm Hg after the last sound, and then allow remaining air to escape quickly.

B. One-step method

- (1) Place stethoscope earpieces in your ears, and be sure sounds are clear, not muffled.
- (2) Relocate patient's brachial or popliteal artery, and place bell or diaphragm chest piece of stethoscope over it. Do not allow chest piece to touch cuff or clothing.
- (3) Close valve of pressure bulb clockwise until tight. Quickly inflate cuff to 30 mm Hg above palpated systolic pressure.

- Gauge indicates correct readings.

- Provides estimate of systolic pressure, which assists in level of cuff inflation particularly when baseline BP is unknown.
- Relocating prevents false low readings. Maximal inflation point for accurate reading can be determined by palpation. If you are unable to palpate artery because of weakened pulse, an ultrasonic stethoscope can be used (see Chapter 31). Completely deflating cuff prevents venous congestion and false high readings.
- Each earpiece should follow angle of ear canal to facilitate hearing.
- Proper stethoscope placement ensures optimal sound reception. An improperly positioned stethoscope causes muffled sounds that often result in false low systolic readings and false high diastolic readings.
- Tightening of valve prevents air leak during inflation.
- Rapid inflation ensures accurate measurement of systolic pressure.



Step 14A(5) Inflating blood pressure cuff.

- Too rapid or slow a decline in pressure can cause inaccurate readings. Noise interferes with precise determination of Korotkoff phases.
- First Korotkoff sound indicates systolic pressure.
- Fourth Korotkoff sound is distinctly muffled and is indication of diastolic pressure in children.
- Beginning of the fifth Korotkoff sound is indication of diastolic pressure in adults. Cuff is deflated as soon as possible because continuous cuff inflation causes arterial occlusion, resulting in numbness and tingling sensation in patient's arm.
- Used for frequent measurements and when there is previous awareness of systolic inflation level.
- Each earpiece should follow angle of ear canal to facilitate hearing.
- Proper stethoscope placement ensures optimal sound reception. Improper positioning of stethoscope causes muffled sounds that often result in false low systolic readings and false high diastolic readings.
- Tightening of valve prevents air leak during inflation. Inflation above systolic level ensures accurate measurement of systolic pressure.

► SKILL 30-5 Measuring Blood Pressure—cont'd**video**

- (4) Slowly release pressure bulb valve, and allow needle of manometer gauge to fall at rate of 2–3 mm Hg/second.
 - (5) Note point on manometer when first clear sound is heard (1st Korotkoff sound). The sound will slowly increase in intensity.
 - (6) Continue to deflate cuff, noting point at which sound becomes muffled or dampened (4th Korotkoff sound).
 - (7) Continue to deflate cuff gradually, noting point at which the sound disappears (5th Korotkoff sounds) in adults. Listen for 10–20 mm Hg after the last sound, and then allow remaining air to escape quickly.
15. Canadian Hypertension Education Program (2011) recommended that two readings separated by 2 minute should be taken. If readings are different by more than 5 mm Hg, additional readings are necessary.
 16. Remove cuff from extremity unless measurement must be repeated. If patient's blood pressure is being assessed for the first time, repeat blood pressure assessment on other extremity.
 17. Assist patient to return to comfortable position, and cover patient's upper arm if it was previously clothed.
 18. Discuss findings with patient as needed.
 19. Perform hand hygiene.
 20. Compare reading with previous baseline value, acceptable value of blood pressure for patient's age, or both.
- Too rapid or slow a decline in pressure can cause inaccurate readings.
 - First Korotkoff sound indicates systolic pressure.
 - Fourth Korotkoff sound is distinctly muffled and indicates diastolic pressure in children.
 - Beginning of the 5th Korotkoff sound is indication of diastolic pressure in adults. Cuff is deflated as soon as possible because continuous cuff inflation causes arterial occlusion, resulting in numbness and tingling sensation in patient's arm.
 - Two sets of blood pressure measurements help prevent false-positive readings resulting from a patient's sympathetic nerve response (alert reaction). Averaging minimizes the effects of anxiety, which often causes a first reading to be higher than subsequent measurements (Canadian Hypertension Education Program, 2011).
 - By comparing blood pressure in both extremities, circulation problems can be detected. (Difference of 5–10 mm Hg between extremities is normal.)
 - These actions restore patient's comfort and promote sense of well-being.
 - Such discussion promotes patient's participation in care and understanding of health status.
 - Hand hygiene reduces transmission of microorganisms between the patient and the nurse.
 - Evaluate for change in condition and alterations.

Critical Decision Point: In some situations (e.g., critically ill patients or those with peripheral vascular disease), it is often necessary to compare blood pressure readings in both arms, both legs, or all four extremities. If using upper extremities, use the arm with the higher pressure for subsequent assessments, unless this is contraindicated.

21. Correlate blood pressure with data obtained from pulse assessment and other related cardiovascular signs and symptoms.
- Blood pressure and heart rate are interrelated.

Unexpected Outcomes

Blood pressure reading cannot be obtained

Blood pressure is not sufficient for adequate perfusion and oxygenation of tissues

Related Interventions

- Determine whether any immediate crisis is present by measuring pulse and respiratory rate.
- Assess for signs of decreased cardiac output (e.g., weak or thready pulse, confusion, pallor, or cyanosis). If any sign is present, notify nurse in charge or prescribing health care provider immediately.
- Use alternative sites or procedures to obtain blood pressure. Auscultate blood pressure in lower extremity; use a Doppler ultrasonic instrument or a palpation method to obtain systolic measurement.
- Repeat blood pressure measurement with sphygmomanometer. Electronic blood pressure devices are less accurate in conditions of low blood flow.
- Compare blood pressure value with baseline value. A systolic reading of 90 mm Hg is an acceptable value for some patients.
- Position patient in supine position to enhance circulation, and restrict activity if this is the cause of blood pressure to decrease.
- Assess for signs of decreased cardiac output (e.g., weak or thready pulse, confusion, pallor, or cyanosis). If any sign present, notify nurse in charge or prescribing health care provider immediately.
- Increase rate of intravenous infusion, or administer vasoconstrictor medications if ordered.

Continued

► SKILL 30-5 Measuring Blood Pressure—cont'd

video

Blood pressure is elevated above acceptable range

- Repeat measurement in patient's other arm, and compare findings. Verify correct size and placement of cuff.
- Ask colleague to repeat measurement in 2 minutes.
- Observe for related symptoms (e.g., headache, confusion), although symptoms are sometimes not apparent until blood pressure is extremely elevated.
- Report elevated blood pressure to nurse in charge or prescribing health care provider immediately.
- Administer antihypertensive medications as ordered.

Recording and Reporting

- Inform patient of value and need for periodic reassessment of blood pressure.
- Record blood pressure in nurses' notes or vital sign flow sheet. Document blood pressure in nurses' narrative notes after administration of specific therapies.
- Report abnormal findings to nurse in charge or prescribing health care provider.

Home Care Considerations

- Assess home noise level to determine which room will provide the quietest environment for assessing blood pressure.
- Consider using electronic blood pressure cuff in the home if patient has hearing difficulties, adequate financial resources, and adequate dexterity.



Figure 30-13 Wall-mounted aneroid sphygmomanometer.

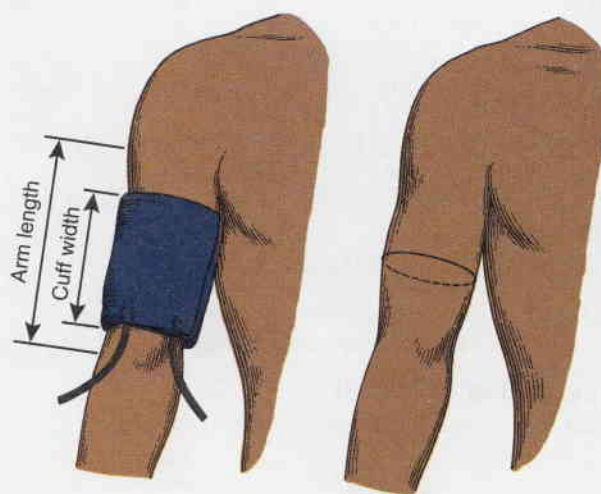


Figure 30-14 Guidelines for proper blood pressure cuff size. Cuff width should be 20% more than upper arm diameter, or 40% of circumference and two-thirds of arm length.

a release valve that inflates the bladder. Manometers are of two types: aneroid (Figure 30-13) and mercury. Aneroid manometers have the advantages of being safe, lightweight, portable, and compact. The aneroid manometer contains a glass-enclosed circular gauge with a needle that registers millimetre calibrations. Before using the aneroid model, ensure the needle is pointing to zero and that the manometer is correctly calibrated. Aneroid sphygmomanometers require biomedical calibration every six months in order to verify accuracy (Jones et al., 2003).

Mercury manometers, once the "gold standard," are less commonly used because they contain mercury, a hazardous substance. Most municipalities have prohibited the sale or use of mercury-containing devices because of potential hazards. Pressure created by the inflation of the cuff moves the column of mercury upward against the force of gravity. Millimetre calibrations mark the height of the mercury column. To ensure

accurate readings, the mercury column should fall freely as pressure is released and always remain at zero when the cuff is deflated. Measure at the meniscus of the mercury at eye level; looking up or down results in distorted readings.

Cloth or disposable vinyl compression cuffs contain an inflatable bladder and come in several sizes. The size selected is proportional to the circumference of the limb being assessed (Figure 30-14). Ideally, the width of the cuff should be 40% of the circumference (or 20% wider than the diameter) of the midpoint of the limb on which the cuff is used. The bladder, enclosed by the cuff, should encircle at least 80% of the arm of an adult and the entire arm of a child. Position the lower edge of the cuff above the patient's antecubital fossa, allowing room for placement of the stethoscope bell or diaphragm. Many adults require a large-sized cuff. Using the forearm when a large cuff is not available is not recommended (Box

* BOX 30-14

EVIDENCE-INFORMED
PRACTICE GUIDELINEForearm Versus Upper Arm Blood
Pressure Measurements

Amy, a registered nurse, had a patient whose upper arms were not accessible for measuring his blood pressure. She thought that she would use his forearm instead of disturbing him to use one of his thighs. She checked a reliable Internet site and learned that blood pressure measurements taken on the forearm and the upper arm had been compared when patients were supine and when the head of the bed was elevated at 45 degrees. The researchers (Schell et al., 2006) had inquired whether placement of the blood pressure cuff affected systolic and diastolic blood pressure. Blood pressure was measured in 221 medical surgical inpatients at both arm locations in the supine and head-elevated positions. The researchers selected cuff size on the basis of forearm and upper arm circumference. Results indicated a significant difference between upper arm and forearm blood pressure in both positions. Both systolic and diastolic blood pressures differed as much as 33 mm Hg. The study concluded that forearm blood pressure measurements should not be substituted for upper arm blood pressure measurements. On the basis of these findings, Amy decided that she would measure the patient's blood pressure by using one of his thighs.

Application to Nursing Practice

Forearm blood pressure measurements should not be substituted for upper arm blood pressure measurements.

Reference: Schell, K., Lyons, D., Bradley, E., Bucher, L., Seckel, M., Wakai, S., et al. (2006). Clinical comparison of automatic noninvasive measurements of blood pressure in the forearm and upper arm with the client supine or with the head of the bed raised 45 degrees: A follow-up study. *American Journal of Critical Care*, 15, 196–205.

30-14). Keep in mind that blood pressure measurements are not accurate unless the correct size cuff is applied appropriately (Table 30-9).

The release valve of the aneroid or mercury sphygmomanometer should be clean and freely movable in either direction. The valve, when closed, holds the pressure constant. A sticky valve makes pressure cuff deflation hard to regulate. The pressure bulb should be free of leaks.

Auscultation. The best environment for blood pressure measurement by auscultation is a quiet room at a comfortable temperature. Although the patient may lie or stand, sitting is the preferred position. In most patients, blood pressure readings obtained in the supine, sitting, and standing positions are similar.

Patient position should be consistent during routine blood pressure measurements to enable meaningful comparison of values. Before measuring blood pressure, attempt to control factors responsible for artificially high readings, such as pain, anxiety, or exertion. Minimize the patient's perceptions that the physical or interpersonal environment is stressful in order to reduce any effect on blood pressure measurement.

During the initial assessment, measure and record the blood pressure in both arms. Normally, pressures in the arms differ by 5 to 10 mm Hg. In subsequent assessments, measure the blood pressure in the arm with the higher pressure. Pressure differences greater than 10 mm Hg indicate vascular problems and should be reported to the prescribing health care provider or nurse in charge.



> TABLE 30-9

Common Mistakes in Blood
Pressure Assessment

Error

Effect

Bladder or cuff too wide	False low reading
Bladder or cuff too narrow or too short	False high reading
Cuff wrapped too loosely or unevenly	False high reading
Deflating cuff too slowly	False high diastolic reading
Deflating cuff too quickly	False low systolic reading and false high diastolic reading
Arm below heart level	False high reading
Arm above heart level	False low reading
Arm not supported	False high reading
Stethoscope that fits poorly or impairment of the examiner's hearing, causing sounds to be muffled	False low systolic reading and false high diastolic reading
Stethoscope applied too firmly against antecubital fossa	False low diastolic reading
Cuff inflating too slowly	False high diastolic reading
Repeating assessments too quickly	False high systolic reading
Inadequate inflation level	False low systolic reading
Multiple examiners using different Korotkoff sounds for diastolic readings	False high systolic reading and low diastolic reading

Ask the patient to state his or her usual blood pressure. If the patient does not know, inform the patient after measuring and recording the blood pressure. Educate the patient about optimal values of blood pressure, the risk factors for developing hypertension, and the dangers of hypertension.

Indirect measurement of arterial blood pressure works on a basic principle of pressure: blood flows freely through an artery until an inflated cuff applies pressure to tissues and causes the artery to collapse. After the cuff pressure is released, the point at which blood flow returns and sound appears through auscultation is the systolic pressure.

In 1905, Nikolai Korotkoff, a Russian surgeon, first described the sounds heard over an artery distal to the blood pressure cuff. The first Korotkoff sound is a clear rhythmical tapping that corresponds to the pulse rate and gradually increases in intensity. *Onset of the sound corresponds to the systolic pressure.* A blowing or swishing sound occurs as the cuff continues to deflate; this is the second Korotkoff sound. As the artery distends, blood flow becomes turbulent. The third Korotkoff sound is a crisper and more intense tapping. The fourth Korotkoff sound is muffled and low-pitched as the cuff is further deflated. At this point, the cuff pressure has fallen below the pressure within the vessel walls; *this sound is the diastolic pressure in infants and children.* The fifth Korotkoff "sound" is actually the disappearance of sound. *In adolescents and adults, the fifth sound corresponds to the diastolic pressure* (Figure 30-15). In some patients, the sounds are clear and distinct. In other patients, only the beginning and ending sounds are clear.

The Canadian Hypertension Education Program (2011) recommended recording two numbers for blood pressure measurement: the point on the manometer when the first sound is heard (systolic reading), and the point on the manometer when the fifth sound is heard (diastolic reading). Some institutions recommend recording the point when the fourth sound is

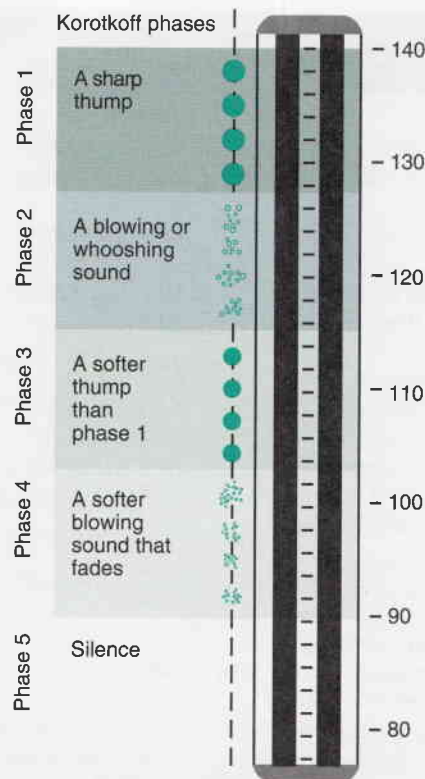


Figure 30-15 The sounds auscultated during blood pressure measurement can be differentiated into five Korotkoff phases. In this example, blood pressure is 140/90.

heard as well, especially for patients with hypertension. Present the numbers by slashed lines (e.g., “120/80” or “120/100/80”). Note the arm used to measure the blood pressure (e.g., “right arm [RA] 130/70”), and the patient’s position (e.g., “sitting”).

Blood pressure findings prompt many medical decisions and nursing interventions concerning a patient’s health care. Obtaining an accurate blood pressure measurement is essential. Error can arise from several sources (see Table 30-9). When unsure of a reading, ask a colleague to reassess the blood pressure.

Assessment in Children. All children three years of age through adolescence should have blood pressure checked at least yearly. Blood pressure in children changes with growth and development. Help parents understand the importance of this routine screening in children who may be at risk for hypertension.

The measurement of blood pressure in infants and children is difficult for several reasons:

- Different arm sizes necessitate careful selection of appropriate cuff size. Do not choose a cuff on the basis of the name of the cuff; for example, an “infant” cuff may be too small for some infants.
- Readings are difficult to obtain in restless or anxious infants and children. Allow a delay of at least 15 minutes to recover from recent activities and apprehension.
- Preparing the child for the blood pressure cuff’s unusual sensation can increase cooperation. Most children understand the analogy of a “tight hug on your arm.”
- Placing the stethoscope too firmly on the antecubital fossa causes errors in auscultation.

BOX 30-15 Procedural Guideline

Palpating the Systolic Blood Pressure

Delegation Considerations:

The skill of palpation of blood pressure *may not be delegated* to unregulated care providers.

Equipment:

Sphygmomanometer.

Procedure:

1. Perform hand hygiene.
2. Apply the blood pressure cuff to the patient’s extremity selected for measurement.
3. Continually palpate the pulse of the patient’s brachial, radial, or popliteal artery with fingertips of one of your hands.
4. Rapidly inflate the blood pressure cuff 30 mm Hg above the point at which the patient’s pulse cannot be palpated.
5. Slowly release the valve and deflate the cuff at a rate of 2 to 3 mm Hg per second.
6. Note the manometer reading when the pulse is again palpable; this is the systolic blood pressure.
7. Deflate the cuff rapidly and completely. Remove the cuff from the patient’s extremity unless repeat measurement is needed.
8. Perform hand hygiene. Record pressure as “[systolic]/—” and palpated (e.g., “blood pressure 108/—, palpated”).

- Korotkoff sounds are difficult to hear in children because of low frequency and amplitude. A pediatric stethoscope bell can be helpful. The fourth Korotkoff sound, which is typically quite muffled, represents the diastolic pressure in infants and children.

Ultrasonic Stethoscope. If you are unable to auscultate sounds because of a weakened arterial pulse, an ultrasonic stethoscope can be used (see Chapter 31). This stethoscope enables you to hear low-frequency systolic sounds. It is commonly used for measuring the blood pressure of infants, children, and adults with low blood pressure.

Palpation. The indirect palpation technique is useful for patients whose arterial pulsations are too weak to create Korotkoff sounds. Severe blood loss and decreased heart contractility are examples of conditions that result in blood pressure too low to auscultate accurately. In these cases, the systolic blood pressure can be assessed by palpation; the diastolic pressure, however, is difficult to assess by palpation (Box 30-15). When using the palpation technique, record the systolic value and how it was measured (e.g., “RA 90/—, palpated, supine”).

The palpation technique can be used with auscultation. In some hypertensive patients, the sounds usually heard over the brachial artery when the cuff pressure is high disappear as pressure is reduced, and then they reappear at a lower level. This temporary disappearance of sound is the **auscultatory gap**. It typically occurs between the first and second Korotkoff sounds. The gap in sound may cover a range of 40 mm Hg and thus may cause you to underestimate systolic pressure or overestimate diastolic pressure. You must be certain to inflate the cuff high enough to hear the true systolic pressure before the auscultatory gap. Palpation of the radial artery helps you determine how high to inflate the cuff. Inflate the cuff to 30 mm Hg above the pressure at which the radial pulse disappeared and rapidly deflate the cuff. Record the range of



Figure 30-16 Lower extremity blood pressure cuff positioned above the popliteal artery at midthigh with knee flexed. **Source:** Courtesy St. Mary's Health Center, St. Louis, MO.

pressures in which the auscultatory gap occurs (e.g., “blood pressure RA 180/94 with an auscultatory gap from 180 to 160, sitting”).

Lower Extremity Blood Pressure. Dressings, casts, intravenous catheters, arteriovenous fistulas, or shunts can render the upper extremities inaccessible for blood pressure measurement. In such cases, blood pressure is measured in the lower extremities. Comparing upper extremity blood pressure with that in the legs is also necessary for patients with certain cardiac or blood pressure abnormalities. The popliteal artery, palpable behind the knee in the popliteal space, is the site for auscultation. The cuff must be wide and long enough to allow for the larger girth of the thigh. Placing the patient in a prone position is best. If such a position is impossible, ask the patient to flex the knee slightly for easier access to the artery. Position the cuff 2.5 cm above the patient's popliteal artery with the bladder over the posterior aspect of the midthigh (Figure 30-16). The procedure is identical to that for brachial artery auscultation. Systolic pressure in the legs is usually 10 to 40 mm Hg higher than in the brachial artery, but the diastolic pressure should be the same.

Automatic Blood Pressure Devices. Many styles of electronic devices are available to determine an automatic blood pressure assessment rather than manual (Figure 30-17). For example, some devices rely on an electronic sensor to detect the vibrations caused by the rush of blood through an artery. When the cuff deflates, the sensor determines the initial burst of vibrations and translates the information into a systolic pressure reading. When the vibrations are lowest, just before they stop, the diastolic pressure is determined. Use electronic blood pressure machines when frequent blood pressure assessment is required, as in critically ill or potentially unstable patients; during or after invasive procedures; or when therapies necessitate frequent monitoring (e.g., intravenous medications for cardiac and blood pressure conditions; Box 30-16). For some patient conditions, the use of automatic blood pressure devices is not appropriate (Box 30-17).

Automatic devices are easy to use and efficient when measurements must be repeated or frequent. The ability to use a stethoscope is not required. However, automatic devices are more sensitive to outside interference, and their readings are susceptible to error. Most automatic blood pressure devices cannot process sounds or vibrations of low blood pressure. The



Figure 30-17 Automatic blood pressure monitor. **Source:** Photo courtesy of Welch Allyn, www.welchallyn.com

range of device sophistication also can make blood pressure measurement comparisons difficult. The use of automatic blood pressure devices enables assessment of blood pressure during interpersonal interactions. However, avoid speaking to the patient for at least a minute before you initiate a blood pressure recording. Talking to a patient when the blood pressure is being assessed can increase readings 10 to 40%.

Obtain a baseline blood pressure measurement by using the auscultatory method before applying automatic devices. A comparison assists in evaluation of a patient's status and allows proper programming of the device. Once the blood pressure cuff is applied, program the device to obtain and record blood pressure readings at preset intervals. Alarm limits can be programmed to alert you if the blood pressure measurement is outside desired parameters.

Self-Measurement of Blood Pressure. More people measure their own blood pressure because of improved technology in home-monitoring devices and a greater interest in health promotion. Portable home devices include aneroid sphygmomanometers and electronic digital readout devices that do not require use of a stethoscope. The electronic devices inflate and deflate cuffs with the push of a button. The electronic devices are easier to manipulate but can require recalibration more than once a year. Because of their sensitivity, improper cuff placement or movement of the arm causes electronic devices to give incorrect readings.

Stationary automatic blood pressure devices can be found in public places such as grocery stores, drug stores, fitness

► BOX 30-16 Procedural Guideline

Electronic Blood Pressure Measurement

Delegation Considerations:

The task of obtaining an electronic blood pressure measurement can be delegated to an unregulated care provider unless the patient is considered unstable or needs close monitoring. The nurse is responsible for assessing the impact of changes in blood pressure; therefore, when the task of obtaining an electronic blood pressure measurement is delegated, it is important to *ensure that the unregulated care provider* performs the following tasks:

- Selects appropriate limb for measurement.
- Selects appropriate-size cuff for designated limb.
- Selects blood pressure cuff recommended by manufacturer.
- Obtains blood pressure measurement for patient with ordered frequency.
- Reports abnormalities.

Equipment:

Electronic blood pressure machine and blood pressure cuff of appropriate size as recommended by manufacturer.

Procedure:

1. Determine appropriateness of using electronic blood pressure measurement. This device is not suitable for use in patients with irregular heart rates, peripheral vascular disease, seizures, tremors, or shivering.
2. Determine best site for cuff placement (see Skill 30-5, Step 2).
3. Select appropriate cuff size for patient's extremity and appropriate cuff for machine. Electronic blood pressure cuff and machine are matched by the manufacturer and are not interchangeable.
4. Assist patient to comfortable position, either lying or sitting. Plug in device, and place near patient, ensuring that the connector hose between the cuff and machine will reach the patient.
5. Prepare blood pressure cuff by manually squeezing all air out of the cuff and connecting cuff to connector hose.
6. Turn on machine to enable device to perform a self-test on internal computer systems.
7. Expose patient's extremity for measurement by removing restrictive clothing, to ensure proper cuff application. Do not place blood pressure cuff over clothing.
8. Wrap flattened cuff snugly around patient's extremity, verifying that only one finger fits between cuff and patient's skin. Make

sure the "artery" arrow marked on the outside of the cuff is correctly placed.

9. Verify that connector hose between cuff and machine is not kinked. Kinking prevents proper inflation and deflation of cuff.
10. In accordance with manufacturer's directions, set frequency control to automatic or manual, and then press "start" button. The first blood pressure measurement will pump the cuff to a pressure of about 180 mm Hg. After this pressure is reached, the machine begins a deflation sequence that helps measure the blood pressure. The first reading is the peak pressure inflation for additional measurements.
11. When deflation is complete, digital display provides most recent values and flashes time (in minutes) that has elapsed since measurement occurred.
12. Set frequency of blood pressure measurements and upper and lower alarm limits for systolic, diastolic, and mean blood pressure readings. Intervals between blood pressure measurements can be set from 1 to 90 minutes. Determine measurement frequency and alarm limits on the basis of patient's acceptable range of blood pressure, your nursing judgement, and health care provider's order.
13. Obtain additional readings at any time by pressing the start button. (Sometimes you need these readings for unstable patients.) Pressing the "cancel" button immediately deflates the cuff.
14. If blood pressure determinations must be frequent, leave the cuff in place. Remove cuff at least every two hours to assess underlying skin integrity, and, if possible, alternate blood pressure sites. Patients with abnormal bleeding tendencies are at risk for microvascular rupture from repeated inflations. When electronic blood pressure machine is no longer needed, clean cuff according to facility policy to reduce transmission of microorganisms between patients.
15. Compare electronic blood pressure readings with auscultatory blood pressure measurements to verify accuracy of the electronic blood pressure device.
16. Record blood pressure and site assessed on vital sign flow sheet or in nurses' notes. Record associated signs of blood pressure alterations in nurses' progress notes. Report abnormal findings to nurse in charge or health care provider.

► BOX 30-17

Patient Conditions Not Appropriate for Electronic Blood Pressure Measurement

- Irregular heart rate
- Peripheral vascular obstruction (e.g., clots, narrowed vessels)
- Shivering
- Seizures
- Excessive tremors
- Inability of patient to cooperate
- Systolic blood pressure of less than 90 mm Hg

clubs, airports, and worksites. Users rest their arms within the machine's inflatable cuff, which contains a pressure sensor. The cuff fits over clothing. A visual display tells users their blood pressure within 60 to 90 seconds. The reliability of the stationary machines is limited. Blood pressure values

(both systolic and diastolic) may vary by 5 to 10 mm Hg or more in comparison with values measured by a manual sphygmomanometer.

Self-measurement of blood pressure has several benefits. Elevated blood pressure may be detected in people previously unaware of a problem. People with high normal blood pressure can provide information about the pattern of blood pressure values. Patients with hypertension can benefit from actively participating in their treatment through self-monitoring, which may subsequently enhance compliance with treatment. The disadvantages of self-measurement include improper use of the device and inaccurate readings. A patient may be needlessly alarmed by one elevated reading. Patients with hypertension may become overly conscious of their blood pressure and inappropriately adjust medication intake.

Patients can learn to use self-measurement devices if they have the information needed to perform the procedure correctly and know when to seek medical attention. Advise

patients that because of possible inaccuracies in the blood pressure devices, they must not adjust their medication regimens without consulting the health care provider. It is important to teach patients the meaning and implications of readings and ensure understanding of proper measurement techniques.

Nursing Process and Blood Pressure Determination

In assessing blood pressure and pulse, the patient's general state of cardiovascular health and responses to other system imbalances can be evaluated. Hypotension, hypertension, orthostatic hypotension, and narrow (small difference) or wide (large difference) pulse pressures are defining characteristics of certain nursing diagnoses, including the following:

- *Activity intolerance*
- *Anxiety*
- *Decreased cardiac output*
- *Deficient/excess fluid volume*
- *Risk for injury*
- *Acute pain*
- *Ineffective tissue perfusion*

The nursing care plan includes interventions specific for the nursing diagnosis identified and the related factors. For example, the defining characteristics of hypotension, dizziness, pulse deficit, and dysrhythmia lead to a diagnosis of *decreased cardiac output*. Related factors may include poor oral intake, excessive heat exposure, and a history of valvular heart disease. The related factor guides the choice of nursing interventions. Evaluate patient outcomes by assessing the blood pressure after each intervention.

Health Promotion and Vital Signs

The emphasis on health promotion and health maintenance, as well as early discharge from hospital settings, has resulted in an increase in the need for patients and their families to monitor vital signs in the home. Teaching considerations affect all vital sign measurements. Incorporate them within the patient's plan of care (Boxes 30-18 and 30-19). Recording Vital Signs

Measurements of vital signs can be recorded on graphic flow sheets (and/or in progress notes). Identify institutional procedures for documenting on the graphic or vital sign flow sheet. In addition to the actual vital sign values, record in the progress notes any accompanying or precipitating symptoms, such as chest pain and dizziness with abnormal blood pressure, shortness of breath with abnormal respiration, cyanosis with hypoxemia, or flushing and diaphoresis with elevated temperature. Document any interventions initiated as a result of abnormal vital sign measurements, such as administration of oxygen therapy or an antihypertensive medication.

For patients for whom critical paths or care maps are used, vital sign values may be listed as outcomes (see Chapter 12). If a vital sign value is higher or lower than the anticipated outcomes, write a variance note to explain the nature of the variance and your course of action. For example, a care map for a patient who has undergone a thoracotomy may list a postoperative outcome of "afebrile." If the patient has a fever, the nurse's variance note addresses possible sources of fever (e.g., retained pulmonary secretions) and nursing interventions (e.g., increased suctioning, postural drainage, or hydration).

* BOX 30-18 FOCUS ON PRIMARY HEALTH CARE

Health Promotion and Vital Signs

Temperature

- Identify patient's ability to initiate preventive health care and recognize alteration in body temperature. Educate patient and caregiver about ways to prevent body temperature alterations.
- Teach patients risk factors for hypothermia and frostbite: fatigue; malnutrition; hypoxemia; cold, wet clothing; and alcohol intoxication.
- Teach patients risk factors for heat stroke: strenuous exercise in hot, humid weather; sudden exposure to hot climates; insufficient fluid intake before, during, and after exercise.
- Teach patients importance of taking and continuing to take antibiotics as directed until course of treatment is completed (e.g., to decrease chance of resurgence of infection or the development of antibiotic-resistant organisms).

Pulse Rate

- Patients taking certain cardiac medications need to learn to assess their own pulse rates to detect side effects.
- Patients undergoing cardiac rehabilitation need to learn to assess their own pulse rates to determine their response to exercise.

Blood Pressure

- Patients with family history of hypertension are at significant risk for hypertension. Teach risk factors for hypertension: obesity, cigarette smoking, heavy alcohol consumption, high blood cholesterol and triglyceride levels, and continued exposure to stress.
- Patients with hypertension need to learn about their blood pressure values, long-term follow-up care and therapy, the lack of obvious symptoms indicative of high blood pressure, ability of

therapy to control but not cure hypertension, and benefits of consistently following treatment plan.

- Teach patient importance of appropriate-sized blood pressure cuff for home use.
- Instruct patient or primary caregiver to measure blood pressure at same time each day and after patient has had a brief rest. Patients should measure blood pressure while sitting or lying down, and they should use the same position and arm each time they measure pressure.
- Instruct patient or primary caregiver that if it is difficult to hear the pressure, the cuff may be too loose, not big enough, or too narrow; the stethoscope is not over arterial pulse; the cuff was deflated too quickly or too slowly; or the cuff was not pumped high enough for systolic readings.

Respirations

- Patients who demonstrate decreased ventilation benefit from learning deep breathing and coughing exercises (see Chapter 48).
- Instruct patient or caregiver to contact home care nurse or prescribing health care provider if unusual fluctuations in respiratory rate occur.
- Teach patient signs and symptoms of hypoxemia: headache, somnolence, confusion, dusky colour of skin and mucous membranes, shortness of breath, and dyspnea.
- Teach patient effect of high-risk behaviours on respiratory function—cigarette smoking, environmental pollutants, etc.

When considering how to teach patients and their families about vital sign measurements and their importance and significance, the patient's age is an important factor. Because of the increase in the population of older adults, caregivers must be more aware of changes that are unique to older adults. Box 30-19 identifies some of these variations.



* BOX 30-19 FOCUS ON OLDER ADULTS

Vital Signs

Temperature

- Normal body temperature ranges from 36°C to 36.8°C orally and 36.6°C to 37.2°C rectally. Temperatures considered to be within normal range sometimes reflect a fever in an older adult.
- Older adults are very sensitive to slight changes in environmental temperature because their thermoregulatory systems are not as efficient (Ebersole et al., 2004).
- Sweat gland reactivity decreases in older adults; as a result, sweating may not occur until temperatures are very high, leading to hyperthermia and heatstroke.
- Loss of subcutaneous fat reduces the insulating capacity of the skin; older men are especially at high risk for hypothermia.
- For older adults, be especially attentive to subtle temperature changes and other manifestations of fever, such as tachypnea, anorexia, falls, delirium, and decline in overall function.

Pulse Rate

- If it is difficult to palpate the pulse of an older adult or an obese patient, a Doppler device provides a more accurate reading.
- Older adults have a decreased heart rate at rest (Ebersole et al., 2004).
- In older adults, it takes longer for the pulse rate to rise to meet sudden increased demands that result from stress, illness, or excitement. Once elevated, the pulse rate of an older adult takes longer to return to normal resting rate (Ebersole et al., 2004).
- Heart sounds are sometimes muffled or difficult to hear in older adults because of an increase in air space in the lungs.

Blood Pressure

- In older adults with decreased upper arm mass, blood pressure cuff size must be selected especially carefully.

- The normal range for blood pressure is the same in older adults as in younger adults. An older adult's blood pressure may elevate with age. Such elevations should not be considered a normal aspect of aging; minor elevations in older adults must be monitored (Chobanian et al., 2003).
- Older adults may have an increase in systolic pressure in relation to decreased vessel elasticity. The diastolic pressure remains the same, which results in a wider pulse pressure.
- Instruct older adults to change position slowly and wait after each change before beginning activity, to avoid orthostatic hypotension and prevent injuries.

Respirations

- Aging causes ossification of costal cartilage and causes the ribs to slant downward, which result in more rigidity of the rib cage, which in turn reduces chest wall expansion. Kyphosis and scoliosis that can occur in older adults restrict chest expansion and decreases tidal volume.
- Older adults depend more on accessory abdominal muscles during respiration than on weaker thoracic muscles.
- The respiratory system matures by the time a person reaches the age of 20 and begins to decline in healthy people after the age of 25. Despite this decline, older adults are able to breathe effortlessly as long as they are healthy. Sudden events that increase demand for oxygen (eg., stress, exercise, illness) lead to shortness of breath in the older adult (Ebersole et al, 2004).
- Identifying an acceptable site for the pulse oximeter probe may be difficult in older adults because of the likelihood of peripheral vascular disease, decreased cardiac output, cold-induced vasoconstriction, and anemia.



❖ KEY CONCEPTS

- Vital sign measurement includes the physiological measurement of temperature, pulse, blood pressure, respiration, and oxygen saturation.
- Vital signs are measured as part of either a complete physical examination or a review of a patient's condition.
- Changes in vital signs are evaluated with other physical assessment findings; clinical judgement is used to determine frequency of measurement.
- Knowledge of the factors influencing vital signs assists in determining and evaluating abnormal values.
- Vital signs provide a basis for evaluating response to nursing and medical interventions.
- Vital signs should be measured when the patient is inactive and the environment is controlled for comfort.
- Patients should be assisted in maintaining body temperature by interventions that promote heat loss, production, or conservation.
- A fever is one of the body's normal defence mechanisms.
- Measurement of temperature with the temporal artery is the least invasive, most accurate method of obtaining core temperature.
- Respiratory assessment includes determining the effectiveness of ventilation, perfusion, and diffusion.
- Assessment of respiration involves observing ventilatory movements through the respiratory cycle.

- Variables affecting ventilation, perfusion, and diffusion influence oxygen saturation.
- Pulse rate and rhythm, measured at the radial or apical pulses, are documented to assess cardiac function.
- Hypertension is diagnosed only after an average of readings made during at least three visits to a health care provider reveals elevated blood pressure.
- Improperly selecting and applying the blood pressure cuff results in measurement errors.
- Changes in one vital sign often influence characteristics of the other vital signs.

❖ CRITICAL THINKING EXERCISES

1. A 47-year-old Aboriginal man is visiting the health clinic for a routine physical examination by the nurse practitioner. The unregulated care provider obtains the following vital sign measurements: tympanic temperature, 36.9°C; right radial pulse rate, 96 beats per minute and irregular; blood pressure, sitting, right arm, 162/82 mm Hg, and left arm, 150/70 mm Hg; SpO₂, 95% on room air; respiratory rate, 22 breaths per minute.
 - a. As the admitting nurse, what questions would you ask this patient to evaluate his risk for hypertension?
 - b. On the basis of these vital sign measurements, what actions should you take?

2. A teenaged mother brings her three-year-old son to the walk-in health centre. She notes that he has been fussy, has not had much of an appetite, and is "not his active self." The boy is crying and struggling to get out of his mother's lap during the interview. You note that he is small for his age but his physical development is otherwise normal.
 - a. Describe the sequence you would use for obtaining vital signs.
 - b. When you select the appropriate equipment for measuring the vital signs, what, if any, special considerations are needed?
 - c. The unregulated care provider reports she has obtained a temperature reading of 37.7°C. What additional information do you request from the unregulated care provider?
3. A 52-year-old woman is admitted to the medical unit for chronic dyspnea and discomfort in her left chest with deep breathing and coughing. She has been smoking for 35 years and has a 20-year history of emphysema. Over the past four months, she has lost 4.5 kg and currently weighs 50 kg.
 - a. When delegating the measurement of vital signs to an unregulated care provider, what information and directions should you provide?
 - b. The blood pressure and heart rate are within acceptable ranges. The temperature is 37.5°C, obtained with an oral electronic thermometer; the respiratory rate is 32 breaths per minute and shallow; and the SpO₂ is 89%. On the basis of these results, list your actions in priority order.
4. An 82-year-old resident in a subacute extended-care facility is being treated for pneumonia with antibiotics. She has been on bed rest for the past two days. She has a history of hypertension, treated with diuretics, but is otherwise healthy. She has been afebrile for the past 24 hours and is eager to walk to the activity room. She has activity orders "up ad lib."
 - a. Should an unregulated care provider be delegated to assist with ambulation?
 - b. What places this patient at risk for fainting?
 - c. Why should the nurse obtain orthostatic measurements?
5. A 25-year-old woman arrives at the prenatal clinic for her first visit. She is eight months pregnant. The unregulated care provider checks her vital signs, height, and weight. The patient weighs 104 kg and is 160 cm tall; blood pressure in her right arm is 210/92 mm Hg; her heart rate is 104 beats per minute; her respiratory rate is 24 breaths per minute; her tympanic temperature is 37.1°C. You are concerned about the patient's blood pressure. In repeating the measurement, you obtain 148/86 mm Hg in the right arm and 144/84 mm Hg in the left arm.
 - a. What blood pressure measurement should be recorded? Provide some possible explanations for the difference between your measurements and those obtained by the unregulated care provider.
 - b. What might you explain about the abnormal vital signs to the patient?
 - c. What will be included in your discharge teaching?
6. A pulse deficit provides information about the heart's ability to adequately perfuse the body. A pulse deficit is
 1. The difference between the radial and apical pulse rates
 2. The digital pressure felt when radial and ulnar pulses are measured
 3. The amount of pressure felt when radial and ulnar pulses are measured
 4. The difference between the systolic and diastolic blood pressure readings
7. As individuals approach older adulthood, body temperature tends to
 1. Gradually decrease
 2. Gradually increase
 3. Fluctuate
 4. Remain the same
8. If a blood pressure cuff is too small, the blood pressure reading is
 1. Falsely low
 2. Falsely high
 3. Difficult to hear because sounds are muffled
 4. Dependent on the examiner's hearing acuity
9. Patients with apnea experience
 1. Difficult respiration that requires more effort
 2. Slowness of breathing, followed by rapid breathing
 3. Cessation of breathing that may be temporary
 4. Lack of oxygen to body tissues and organs
10. When teaching patients about management of hypertension, focus of topics should include all of the following except
 1. Diet modification
 2. Self-measurement of BP and acceptable range of results
 3. Self-adjustment of antihypertensive medications
 4. Stress management
11. An older adult recently on bed rest is assisted out of bed. The nurse measures his blood pressure as the patient changes position, and the results are as follows: 140/80 supine, 132/72 sitting, 108/60 standing. The patient also mentions that he feels light-headed. The nurse should immediately
 1. Assist the patient to return to a supine position
 2. Obtain a blood pressure measurement in the other arm
 3. Report the findings to the nurse in charge
 4. Help the patient walk
12. A nurse is measuring a patient's vital signs. The nurse notes that the radial pulse is initially strong, diminishes in intensity, and has an interruption in rhythm about every four to six beats. The nurse should immediately
 1. Report the findings to a health care provider
 2. Measure the apical pulse for 60 seconds
 3. Connect the patient to a cardiac monitor
 4. Measure apical and radial pulse rates simultaneously for 60 seconds
13. Nursing interventions such as applying cool cloths act to decrease body temperature through
 1. Conduction
 2. Convection
 3. Evaporation
 4. Radiation

❖ REVIEW QUESTIONS

1. During a nursing assessment, an adult patient is noted to have shallow respirations at a rate of eight per minute. His heart rate is 46 beats per minute. His vital signs would be described as
 1. Bradycardia and apnea
 2. Tachycardia and apnea
 3. Bradycardia and bradypnea
 4. Tachycardia and bradypnea

10. Poor oxygenation of the blood ordinarily affects the pulse rate, causing it to become
 1. Bounding
 2. Irregular
 3. Faster than normal
 4. Slower than normal
11. When measuring oxygen saturation, all of the following can influence the reading, resulting in inaccurate results, except for
 1. Rapid heart rate, reduced circulation to extremities
 2. Nail polish, tremors
 3. Decreased respiratory depth and effort
 4. Bright light near measuring site
12. Which of these basic techniques are used to determine vital signs?
 1. Inspection, palpation, and auscultation
 2. Inspection, blood work, and radiography
 3. Rhythm and rate measurements and open communication
 4. Psychology, physiology, and nursing skills

❖ RECOMMENDED WEB SITES

Canadian Hypertension Society: <http://www.hypertension.ca/>

This Web site has links to three key organizations dealing with hypertension in Canada: (1) the Canadian Hypertension Society (CHS), (2) the Canadian Hypertension Education Program (CHEP), and (3) Blood Pressure Canada (BPC). The site offers information on hypertension to health providers and the public. It also includes valuable links to related topics (e.g., Heart and Stroke Canada). The mission of CHS is to promote the prevention and control of hypertension through research and education. CHEP is a volunteer, nonprofit hypertension

education program that provides annually updated, relevant, evidence-informed hypertension guidance. BPC is committed to providing high-quality educational material and sources for patients. All sites provide educational tools.

Centre for Chronic Disease Prevention and Control: Cardiovascular Disease: <http://www.phac-aspc.gc.ca/cd-mc/cvd-mcv/index-eng.php>

This Web page, part of the Web site of the Public Health Agency of Canada, provides links to a variety of Canadian resources on cardiovascular health, including the Heart and Stroke Foundation of Canada and the Canadian Stroke Network.

British Columbia Ministry of Health Services, Guidelines and Protocols Advisory Committee (GPAC): Hypertension—Detection, Diagnosis and Treatment of Hypertension: http://www.bcguidelines.ca/gpac/submenu_cardio.html

Part of the British Columbia Ministry of Health Services, the Guidelines and Protocols Advisory Committee developed several documents to recommend proper blood pressure management, including the recommended technique for measuring blood pressure. Other topics are home blood pressure monitoring, dietary approaches, and a patient guide.

Heart & Stroke Foundation of Alberta, Northwest Territories, and Nunavut: Healthy Living: http://www.heartandstroke.ab.ca/site/c.lqIRL1PJtH/b.3650753/k.F791/Heart_Disease_Stroke_and_Healthy_Living.htm

Sponsored by the Public Health Agency of Canada (Health Canada) and the Heart and Stroke Foundation of Canada, this Web site provides information on several blood pressure and heart disease.

Review Question Answers

1. 3; 2. 1; 3. 1; 4. 2; 5. 3; 6. 3; 7. 1; 8. 2; 9. 1; 10. 3; 11. 3; 12. 1

Rationales for the Review Questions appear at the end of the book.

Health Assessment and Physical Examination

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objectives

Mastery of content in this chapter will enable you to:

- Discuss the purposes of physical assessment.
- Discuss cultural diversity, cultural competency, and cultural safety as these relate to the provision of culturally competent health and physical assessment and improved patient health outcomes.
- Identify data to collect from the nursing history before a physical examination.
- Describe environmental preparations necessary prior to a physical examination.
- List techniques used to prepare a patient physically and psychologically before and during an examination.
- Demonstrate the techniques used with each physical assessment skill.
- Describe physical measurements made in assessing each body system.
- Discuss normal physical findings in a young, a middle-aged, and an older adult.
- Identify preventive screenings and the appropriate age(s) for each screening to occur.
- Identify self-screening examinations commonly performed by patients.
- Discuss ways to incorporate health promotion and health teaching into the examination.
- Identify how nurses use physical assessment skills during routine nursing care.

key terms

- Acromegaly, p. 558
- Adventitious sounds, p. 576
- Alopecia, p. 554
- Aneurysm, p. 597
- Aphasia, p. 611
- Apical impulse, p. 578
- Arcus senilis, p. 561
- Atherosclerosis, p. 583
- Atrophied, p. 599
- Basal cell carcinoma, p. 553
- Benign (fibrocystic) breast disease, p. 593
- Borborygmi, p. 596
- Bronchophony, p. 577
- Bruit, p. 584
- Capillary refill, p. 557
- Caries, p. 569
- Cerumen, p. 563
- Chancre, p. 599
- Cherry angiomas, p. 553
- Cholecystitis, p. 597
- Cirrhosis, p. 556
- Clubbing, p. 587
- Conjunctivitis, p. 561
- Cyanosis, p. 551
- Dermatitis, p. 552
- Distension, p. 540
- Dysrhythmia, p. 581
- Ectropion, p. 560
- Eczema, p. 552
- Edema, p. 553
- Entropion, p. 560
- Erythema, p. 551
- Excoriation, p. 566
- Exophthalmos, p. 559
- Exostosis, p. 570
- Goniometer, p. 606
- Hemorrhoids, p. 603
- Hepatitis B virus, p. 596
- Hernias, p. 595
- Hirsutism, p. 554
- Hydrocephalus, p. 558
- Hypertonicity, p. 607
- Hypotonicity, p. 607
- Indurated, p. 552
- Integument, p. 550
- Jaundice, p. 551
- Kyphosis, p. 604
- Leukoplakia, p. 569
- Lordosis, p. 604
- Melanoma, p. 550
- Metastasis, p. 592
- Murmurs, p. 582
- Nystagmus, p. 562
- Occlusion, p. 583
- Ophthalmoscope, p. 562
- Orthopnea, p. 575
- Osteoporosis, p. 604
- Otoscope, p. 565
- Ototoxicity, p. 565
- Palpation, p. 540
- Pancreatitis, p. 597
- Papanicolaou (Pap) smear, p. 600
- Paralytic ileus, p. 596
- Peristalsis, p. 596
- Peritonitis, p. 596
- PERRLA, p. 562
- Petechiae, p. 553
- Phlebitis, p. 588
- Pigmentation, p. 551
- Point of maximal impulse (PMI), p. 578
- Polyps, p. 567
- Ptosis, p. 560
- Pulse deficit, p. 581
- Scoliosis, p. 604
- Senile keratosis, p. 553
- Squamous cell carcinoma, p. 553
- Stenosis, p. 583
- Strabismus, p. 559
- Striae, p. 594
- Syncope, p. 583
- Tactile fremitus, p. 575
- Thrill, p. 582
- Turgor, p. 553
- Varicosities, p. 570
- Ventricular gallop, p. 582
- Vocal fremitus, p. 575
- Whispered pectoriloquy, p. 577

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- Student Learning Activities
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A holistic assessment of a patient's health status involves the collection of a broad range of data that includes information about the emotional, intellectual, physical, psychosocial, and spiritual dimensions (see Chapter 15) and the cultural (see Chapter 9) dimensions. The process for collecting data about a patient includes a thorough health history and the physical examination. The physical exam, although primarily focused on physiological function, may also include assessment of cognition, mood, and functional status.

As a front-line health care worker, a nurse is sometimes the first person with whom patients are in contact when they are provided with health care services. It is, therefore, extremely important that nurses be able to detect changes in a patient's condition. Whether the nurse is conducting health assessments at health fairs, at screening clinics, in physicians' offices, in acute care agencies, or in a patient's home, nurses continuously seek information about patients' health status. For this reason, the ability to critically think and interpret the meaning of a patient's behaviour and physiological status is a skill that is important in professional nursing practice.

The skills of physical assessment and examination provide powerful tools to detect subtle, as well as obvious, changes in a patient's health. Physical assessment enables the nurse to assess patterns reflecting health problems and to evaluate the patient's progress following therapy. Health screenings may focus on a specific physical problem or assess cognition, mood, and functional status. For example, nurses perform blood pressure screenings to detect the risk for high blood pressure, or a nurse may use a depression screening tool to detect alterations in mood. If screening determines that a patient has a risk for a disease or disorder, the nurse refers the patient for a more complete physical examination.

A complete health assessment involves a nursing history (see Chapter 12), a behavioural and physical examination, and a cultural assessment (see Chapter 9). The health history involves a lengthy patient interview to gather subjective data about the patient's condition. The focus of this chapter is an introduction to the skills necessary to perform a physical examination. For a more comprehensive study on physical assessment skills, refer to Jarvis et al. (2009), *Physical Examination and Health Assessment*, First Canadian Edition.

A complete physical examination is a head-to-toe review of each body system that offers objective information about the patient. This allows the nurse to make clinical judgements and develop the plan for nursing care. The patient's condition and response affect the extent of the examination. The accuracy of the physical assessment will influence the choice of therapies a patient receives and the evaluation of the response to those therapies. Continuity in health care improves when the nurse makes ongoing, objective, and comprehensive assessment.

Social and Cultural Considerations

Culturally competent health and physical assessment requires the nurse to be culturally aware and sensitive (see Chapter 9). The nurse demonstrates cultural competence, in part, by respecting patient preference when completing an examination, whether this is based on individual or cultural preference. It is important to remember that social or cultural background may influence a patient's behaviour and beliefs about health. Integrating cultural assessment with health and physical assessment for every patient (see Chapter 9) provides the nurse with the background data needed to facilitate a

culturally competent physical examination. Assessment data about the use of complementary or folk therapies, dietary preferences, family relationships (including extended family), and past experiences with health care offer important clues to help the nurse better understand how to perform physical assessment in ways that are respectful of these preferences and help build relational practice. Ethnohistorical, biocultural, and socioeconomic assessment data may provide important information about potential health risks; for example, a new Canadian may be at increased risk of exposure to tuberculosis depending on the country of origin.

Cultural assessment data inform a culturally safe physical assessment, by providing information that helps the nurse think critically about the political, social, and economic contexts of patients' lives and how inequities in power and access to resources for health influence the health of individuals (see Chapter 9; Browne & Varcoe, 2009). Applying a cultural safety lens will help the nurse avoid stereotyping patients on the basis of gender or ethnicity (see Chapter 9). Learn to recognize common biocultural variations of normal as well as disorders that may be more common in certain populations in the community. For example, infants of Aboriginal, Asian, or African descent may exhibit mongolian spots, which is a normal variation of hyperpigmentation seen in newborns (Jarvis et al., 2009). Canadians of Aboriginal, African, or South Asian ancestry may be more likely to exhibit the signs and symptoms of high blood pressure or diabetes (Jarvis et al., 2009). Providing culturally competent care potentially leads to greater patient satisfaction and improved clinical outcomes (Galanti, 2004).

Purposes of Physical Examination

An examination is designed to address the patient's needs. In an acutely ill patient, the nurse assesses only the involved body system(s). When a patient is having an asthmatic attack, the nurse initially assesses the pulmonary and cardiac systems. Then a more comprehensive examination about the patient's total health status is completed when the patient is physiologically more stable. Commonly, a complete physical examination is performed for routine screening to promote wellness behaviours and preventive health care measures, such as the routine annual medical exam. Additionally, a complete medical exam is often required to determine eligibility for extended health insurance, military service, a specialized driver's license, as a pre-employment medical exam for a new job, and with the admission process to hospital or long-term care facility.

A complete physical examination provides valuable information for all members of the patient's health care team. Thorough examination and documentation contribute to the following essential elements for comprehensive evidence-informed care:

- Gather baseline data about the patient's health status
- Supplement, confirm, or refute data obtained in the history
- Confirm and identify nursing diagnoses
- Make clinical judgements about a patient's changing health status and management
- Evaluate the outcomes of care

To assist in learning about the physical assessment of body systems, it is helpful to review anatomy. The Web site NurseONE contains an anatomy program, *Anatomy.tv*, that will assist in the identification and location of human anatomy. For example, you can use the program to identify the location of cranial nerves, which will be helpful for understanding

the function of each nerve and the muscles innervated by the nerve. Information on nursing student access to NurseONE can be found at the following link: <http://www.cnsa.ca/english/aboutus/faq/what-is-nurseone-and-how-do-i-register>. Then access NurseONE at <http://www.nurseone.ca/> and click the link to "Library," then click on "STAT!Ref," and then click on "Anatomy.tv."

Gathering a Health History

The main objective of interacting with patients is to find out what their concerns are and to help them find solutions. Pay close attention to a patient's concerns. Direct the interview and examination so that you can create a clear picture of the patient's condition. Collection of a health history and physical examination data requires patience and a dedication to thoroughness and detail. Conducting a successful interview and physical examination is based on several principles, relational practice being foremost (see Chapters 9 and 12). The interview allows for the formation of a partnership with the patient. Orient the interview to the patient, not to a disease. For example, a patient is not a "diabetic"; rather he or she is "a person who has diabetes." Make sure you know your own idiosyncrasies (e.g., wanting to be liked, fear of harming the patient or catching a disease) so you are able to prevent these feelings from affecting the therapeutic relationship you will develop with the patient.

Developing Nursing Diagnoses and a Care Plan

After gathering information about the patient's health from the health history, a subsequent physical assessment can reveal information that refutes, confirms, or supplements the history. Think critically about the information the patient provides, apply knowledge from previous clinical care, and methodically conduct the examination to create a clear picture of the patient's health status. For example, if a patient complains of back pain, ask the patient several questions to clarify the nature of the pain. During the examination, look carefully for the source of the pain (e.g., discomfort when changing position or a bruise across the patient's back) to rule out a variety of potential conditions (e.g., back strain, contusions, trauma, scoliosis). It is important to remember that one assessment finding (e.g., back pain) does not conclusively reveal the nature of an abnormality. A complete assessment is necessary to form a definitive nursing or medical diagnosis. Grouping significant findings into clusters of data assists in revealing actual or "risk for" nursing diagnoses (see Chapter 12). In addition, each abnormal finding suggests the need to gather additional information.

Information gathered during the initial history and physical assessment provides a baseline for the patient's functional abilities. This baseline is a record of findings identified when the patient was first assessed that can be used as a comparison for future assessment findings. Thus, the comprehensiveness and attention to detail in the documentation enable you and others to determine changes in a patient's condition during subsequent assessments.

The accuracy of the database allows for the development of an individualized nursing diagnosis (Table 31-1). Physical assessment findings determine the etiology of the diagnosis so that the selection of interventions is appropriate for the care plan. It is important to view physical assessment as an ongoing process, and thus the care plan changes with changes in the patient's condition. Ongoing monitoring of the patient's

progress and responses to therapies and treatments necessitate a review of the nursing diagnoses and plan of care as health conditions resolve or deteriorate, and when new health problems arise.

Managing Patient Problems

When caring for patients, the nurse assesses and performs a variety of interventions. Yet the nurse's success in giving care depends on the ability to recognize a change in status and to modify interventions so that patients gain the most desirable outcomes. Physical assessment skills allow nurses to judge the status of patients' health and direct the management of care. For example, the nurse inspects the skin during a routine bath and finds it excessively dry. The nurse does not use soap and applies body lotion to the skin. The nurse revises the written care plan so that other nurses know the type of skin care to provide and instructs the patient about skin care. Performing the mechanics of physical assessment is relatively simple. The more difficult challenge lies in using findings to make decisions.

Evaluating Nursing Care

Nurses demonstrate accountability for their nursing care through evaluating the results of nursing interventions. Physical assessment skills enhance the evaluation of nursing measures through monitoring physiological and behavioral outcomes of care. Nurses use physical assessment skills to assess a condition (e.g., palpation of the patient's pulse) and evaluate a patient's response to care (e.g., an evaluation of a patient's tolerance to an exercise plan). Accurate, detailed, objective documentation of measurements through physical assessment assists in determining whether the expected outcomes of care are met.

Skills of Physical Assessment

A comprehensive physical examination involves the use of five skills: inspection, palpation, percussion, auscultation, and olfaction.

Inspection

Inspection is the use of vision and hearing to distinguish normal from abnormal findings. It is important to know what to consider normal for patients of different age groups. You will need experience to recognize normal variations among patients. Inspection is a simple technique that can provide valuable clues about a patient's health status. The quality of an inspection depends on the nurse's willingness to spend time doing a thorough job. To inspect body parts accurately, follow these principles:

- Make sure adequate lighting is available.
- Position and expose body parts so all surfaces can be viewed.
- Inspect each area for size, shape, colour, symmetry, position, drainage, and abnormalities.
- When possible, compare each area inspected with the same area on the opposite side of the body.
- Use additional light (e.g., a penlight) to inspect body cavities.
- Do not hurry inspection. Pay attention to detail.

After inspection of a body part, findings sometimes indicate the need for further examination. Use palpation with or after visual inspection.

► **TABLE 31-1** Development of Individualized Nursing Diagnoses

Assessment Method	Findings	Patterns	Nursing Diagnosis
Inspection of skin	Skin along sacral area is intact. There is a 3 cm area of redness around coccyx; skin blanches on palpation.	There is pressure area around coccyx.	<i>Risk for impaired skin integrity</i>
Palpation of skin	There are no skin lesions. Skin is moist from diaphoresis. There is tenderness to palpation around sacral area. There is elastic skin turgor.	Skin moisture promotes maceration.	
Historical data	Patient suffered fractured left leg. Patient's mobility is reduced as a result of left leg traction.		

Palpation

Palpation involves the use of the hands to touch body parts to make sensitive assessments. Use palpation to examine all accessible parts of the body. For example, palpate the skin for temperature, moisture, texture, turgor, tenderness, and thickness. Palpate the abdomen for tenderness, **distension** (swelling), or masses. Use different parts of the hand to detect characteristics such as texture, temperature, and perception of movement (Table 31-2).

Before palpation, help the patient relax and be comfortable because muscle tension during palpation impairs effective assessment. To promote relaxation, have the patient take slow, deep breaths and place the arms along the side of the body. *Palpate tender areas last.* Be sure to ask the patient to point out the more sensitive areas. Watch the patient's facial expressions and body movements and note any nonverbal signs of discomfort.

Palpation requires warm hands, short fingernails, and a gentle approach. Perform palpation slowly, gently, and deliberately. Light, intermittent pressure is best when palpating; heavy, prolonged pressure causes a loss of sensitivity in the hand. To avoid injuring a patient, do not attempt deep palpation without clinical supervision. Caution is the rule. Use the most sensitive parts of the hand, the palmar surface of the fingers and finger pads, to determine position, texture, size, consistency, masses, fluid, and crepitus (Figure 31-1, A). Measure temperature using the dorsal surface or back of the hand (Figure 31-1, B). The ulnar surface of the hand and finger (Figure 31-1, C) is more sensitive to vibration. Measure position, consistency, and turgor by lightly grasping the body part with the fingertips (Figure 31-1, D).

Do not palpate without considering the patient's condition. For example, if the patient has a fractured rib, use extra care to locate the painful area. Do not palpate a vital artery with pressure that obstructs blood flow. Also consider the body area being palpated, as well as the reason for using palpation.

Percussion

Percussion involves tapping the body with the fingertips to produce a vibration that travels through body tissues. The character of the sound determines the location, size, and density of underlying structures to verify abnormalities assessed by palpation and auscultation. This vibration is transmitted through body tissues, and the character of the sound heard depends on the density of the underlying tissue. By knowing the way various densities influence sound, you locate organs or masses, map their boundaries, and determine their size. An abnormal sound suggests a mass or substance such as

► **TABLE 31-2** Examples of Characteristics Measured by Palpation

Area Examined	Criteria Measured	Portion of Hand to Use
Skin	Temperature	Dorsum of hand/fingers
	Moisture	Palmar surface
	Texture	
	Turgor and elasticity	Grasping with fingertips
Organs (e.g., liver and intestine)	Tenderness	Palmar surface/pads of fingertips
	Thickness	Palmar surface/pads of fingertips
	Size	Entire palmar surface of hand or palmar surface of fingers
	Shape	Palmar surface/pads of fingertips
Glands (e.g., thyroid and lymph)	Tenderness	Entire palmar surface of hand or palmar surface of fingers
	Absence of masses	
	Swelling	Pads of fingers
	Symmetry and mobility	Palmar surface/pads of fingertips
Blood vessels (e.g., carotid or femoral artery)	Pulse amplitude	Palmar surface/pads of fingertips
	Elasticity	
	Rate	
	Rhythm	
Thorax	Excursion	Palmar surface
	Tenderness	Finger pads/palmar surface of fingers
	Fremitus	Palmar or ulnar surface of entire hand

air or fluid within an organ or body cavity. The skill of percussion requires dexterity and is usually used by advanced practitioners.

Auscultation

Auscultation involves listening to sounds the body makes to detect variations from normal. You are able to hear some

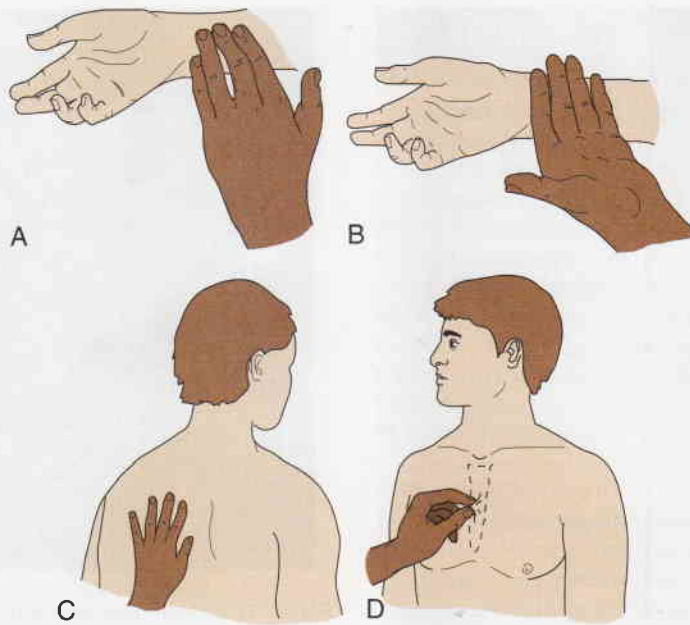


Figure 31-1 A, Radial pulse is detected with the pads of fingertips, the most sensitive part of the hand. B, Dorsum of the hand detects temperature variations in skin. C, The bony part of the palm at the base of the fingers detects vibrations. D, Skin is grasped with the fingertips to assess turgor.

sounds without assistance but will need a stethoscope for most sounds.

First, learn the normal sounds created by the cardiovascular, respiratory, and gastrointestinal (GI) systems, such as the passage of blood through an artery. Recognize abnormal sounds after learning normal variations. Becoming more proficient in auscultation occurs by knowing the types of sounds each body structure makes and the location in which you hear the sounds best. Also, learn which areas do not normally emit sounds.

To auscultate correctly, the nurse needs to hear well, have a good stethoscope, and know how to use it properly. For those with a hearing disorder, use a stethoscope with greater sound amplification. Always place the stethoscope directly on the skin, because clothing obscures sound. Chapter 30 describes the parts of the stethoscope and its general use. The bell is best for low-pitched sounds, such as vascular and certain heart sounds, and the diaphragm is best for high-pitched sounds, such as bowel and lung sounds.

Be familiar with the stethoscope before attempting to use it. Practise using the stethoscope. Extraneous sounds created by movement of the tubing or chestpiece interfere with auscultation of body organ sounds. By deliberately producing these sounds, learn to recognize and disregard them during the actual examination.

Learn to recognize the following characteristics of sounds:

- Frequency, or the number of sound wave cycles generated per second by a vibrating object. The higher the frequency, the higher the pitch of a sound, and vice versa.
- Loudness, or the amplitude of a sound wave. Auscultated sounds are loud or soft.
- Quality, or sounds of similar frequency and loudness from different sources. Terms such as *blowing* or *gurgling* describe the quality of sound.
- Duration, or the length of time that sound vibrations last. The duration of sound is short, medium, or long. Layers of

soft tissue dampen the duration of sounds from deep internal organs.

Auscultation requires concentration and practice. Always consider the part of the body auscultated and the cause of the sound. For example, closure of the mitral valve causes the first heart sound. Learn where you hear the sounds best. You typically hear the first heart sound best when auscultated at the left fifth intercostal space along the midclavicular line. It is also important to learn the characteristics of normal sounds. The first heart sound has the quality of a loud “lub,” whereas the second sound is a “dub.” After understanding the cause and character of normal auscultated sounds, it becomes easier to recognize abnormal sounds and their origins.

Olfaction

While assessing a patient, become familiar with the nature and source of body odours (Table 31-3). Olfaction helps to detect abnormalities that you cannot recognize by any other means. For example, if a patient’s cast has a sweet, heavy, thick odour, this indicates an underlying infection. Findings from olfaction and other assessment skills should prompt the nurses to investigate the origin of the odour as it may indicate abnormalities.

Preparation for Examination

Proper preparation of the environment, equipment, and patient ensures a smooth physical examination with few interruptions. A disorganized approach when preparing for a physical examination will cause errors and incomplete findings.

Infection Control

During an examination, some patients will present with open skin lesions or weeping wounds. Use standard precautions throughout the examination (see Chapter 32) as appropriate. It is necessary to wear gloves during palpation and percussion to reduce contact with microorganisms. If a patient has excessive

► **TABLE 31-3** Assessment of Characteristic Odours

Odour	Site or Source	Potential Causes
Alcohol	Oral cavity	Ingestion of alcohol, diabetes
Ammonia	Urine	Urinary tract infection, renal failure
Body odour	Skin, particularly in areas where body parts rub together (e.g., underarms and under breasts)	Poor hygiene, excess perspiration (hyperhidrosis), foul-smelling perspiration (bromhidrosis)
	Wound site	Wound abscess
	Vomitus	Abdominal irritation, contaminated food
Feces	Vomitus/oral cavity (fecal odour)	Bowel obstruction
	Rectal area	Fecal incontinence
Foul-smelling stools in infant	Stool	Malabsorption syndrome
Halitosis	Oral cavity	Poor dental and oral hygiene, gum disease
Sweet, fruity ketones	Oral cavity	Diabetic acidosis
Stale urine	Skin	Uremic acidosis
Sweet, heavy, thick odour	Draining wound	<i>Pseudomonas</i> (bacterial) infection
Musty odour	Casted body part	Infection inside cast
Fetid, sweet odour	Tracheostomy or mucous secretions	Infection of bronchial tree (<i>Pseudomonas</i> bacteria)

drainage or risk of spray from a wound, wear a gown and other personal protective equipment as needed. Always wash hands before initiating and after completing a physical assessment.

Environment

A physical examination requires privacy. A well-equipped examination room is preferable, but often the examination occurs in the patient's room. In the home, you will often perform an examination in the patient's bedroom. Any examination room needs to be well equipped for all necessary procedures. Adequate lighting is necessary for proper illumination of body parts. Ideally, an examination room is soundproof, so patients feel comfortable discussing their conditions. Be sure to eliminate sources of noise, take precautions to prevent interruptions from others, and make sure the room is warm enough to maintain comfort.

Sometimes it is difficult to perform a complete examination when patients are in beds or on stretchers. Special examination tables make patients easily accessible and help them assume special positions. Carefully assist patients so that they do not fall while getting on and off the table. Do not leave a confused, combative, or uncooperative patient unsupervised on an examination table.

Examination tables are often hard and uncomfortable. When the patient lies supine, raise the head of the table about 30 degrees. Also give the patient a small pillow to use. When



Figure 31-2 Equipment used during a physical examination.

examining a patient in bed, raise the bed to reach the patient's body parts more easily. Remember to use proper body mechanics to ensure your physical safety while performing an exam.

Equipment

Perform hand hygiene thoroughly before equipment preparation and the examination. Set up equipment so it is readily available and arranged in order for easy use (Figure 31-2). Keep equipment as warm as appropriate. Rub the diaphragm of the stethoscope briskly between the hands before applying it to the skin. If assisting with a vaginal exam, run warm water over the vaginal speculum just before using. The ophthalmoscope and otoscope require good batteries and light bulbs. Check all equipment to ensure that it functions properly. Box 31-1 lists typical physical assessment equipment used to perform a complete medical exam.

Physical Preparation of the Patient

The patient's physical comfort is vital for an accurate examination. Before starting, ask if the patient needs to use the restroom. An empty bladder and bowel facilitate examination of the abdomen, genitalia, and rectum. Collection of urine or fecal specimens occurs at this time if needed. Be sure to explain the proper method for collecting specimens, and make sure to label each specimen properly.

Physical preparation involves being sure the patient is dressed and draped properly. The patient in the hospital will likely be wearing only a simple gown. An outpatient will have to undress and wear a light cover gown. If the examination is limited to certain body systems, it is not always necessary for the patient to undress completely. Provide the patient privacy and plenty of time during undressing. Walking into the room as the patient undresses causes embarrassment. Drapes and gowns are made of linen or disposable paper. After patients have undressed and put on a gown, they sit or lie down on the examination table with the drape over the lap or lower trunk. Make sure the patient stays warm by eliminating drafts, controlling room temperature, and providing warm blankets. Routinely ask if the patient is comfortable.

► BOX 31-1

Equipment and Supplies for Physical Assessment

- Cervical brush or broom devices (if needed)
- Cotton applicators
- Disposable pad/paper towels
- Drapes
- Eye chart (e.g., Snellen chart)
- Flashlight and spotlight
- Forms (e.g., physical, laboratory)
- Gloves (sterile and clean)
- Gown for patient
- Ophthalmoscope
- Otoscope
- Papanicolaou (Pap) liquid prep (if needed)
- Percussion (reflex) hammer
- Pulse oximeter
- Ruler
- Scale with height measurement rod
- Specimen containers, slides, wooden or plastic spatula, and cytological fixative (if needed)
- Sphygmomanometer and cuff
- Sterile swabs
- Stethoscope
- Tape measure
- Thermometer
- Tissues
- Tongue depressors
- Tuning fork
- Vaginal speculum (if needed)
- Water-soluble lubricant
- Wristwatch with second hand or digital display

Positioning. During the examination ask the patient to assume proper positions so that body parts are accessible and the patient stays comfortable. Table 31-4 lists the preferred positions for each part of the examination and contains figures illustrating these positions. Patients' abilities to assume positions will depend on their physical strength, mobility, ease of breathing, age, and degree of wellness. Explain the positions, and assist patients in assuming them. Adjust the drapes so that the area examined is accessible, making sure not to unnecessarily expose a body part. A patient may assume more than one position. To decrease the number of times the patient changes positions, organize the examination so that you perform all techniques requiring a sitting position first, then perform those that require a supine position next, and so forth. Be sure to use extra care when positioning older adults, because they are more prone to having disabilities and limitation.

Psychological Preparation of the Patient

Many patients find an examination stressful or tiring, or they experience anxiety about possible findings. A thorough explanation of the purpose and steps of each assessment lets patients know what to expect and what to do so that they can cooperate. Keep explanations simple and in understandable terms. Help patients to feel free to ask questions and mention any discomfort. As you examine each body system, give a more detailed explanation. Convey an open, professional approach while remaining relaxed. A still, formal demeanour will inhibit the patient's ability to communicate, but a style that is too casual will fail to assure the patient (Jarvis et al., 2009).

When the patient and nurse are of opposite gender, it helps to have a third person of the patient's gender in the room. The presence of a third person assures the patient that the examiner will behave ethically. This person is also a witness to the examiner's conduct and the patient's.

During the examination, watch the patient's emotional responses. Observe whether the patient's facial expression shows fear or concern and if body movements show anxiety. Remain calm, and explain each step clearly. It is sometimes necessary to stop the examination and ask how the patient feels. Do not force the patient to continue. Postponing the examination is advantageous because the findings may be more accurate when the patient can cooperate and relax. If the patient's fears result from misconceptions, clarify the purpose of the examination and how you will perform it.

Assessment of Age Groups

It is necessary to use different interview styles and approaches to physical examination for patients of different age groups. When assessing children, be sensitive and anticipate the child's reaction to the examination as a strange and unfamiliar experience. Routine pediatric examinations focus on health promotion and illness prevention, particularly for the care of well children who have no serious health problems (Hockenberry & Wilson, 2007). This examination focuses on growth and development, sensory screening, dental examination, and behavioural assessment. Children who are chronically ill or disabled, foster children, or adopted children sometimes require additional examination visits. When examining children, the following tips assist in data collection:

- Gather all or part of the histories on infants and children from parents or guardians.
- Perform the examination in a nonthreatening area; provide time for play to become acquainted.
- Because parents sometimes think the examiner is testing them, offer support during the examination and do not pass judgement.
- Call children by their first name, and address the parents as "Mr.," "Mrs.," or "Ms.," rather than by their first names.
- Use open-ended questions to allow parents to share more information and describe more of the children's problems. This also allows observation of parent-child interactions. Interview older children, who often provide details about their health history and severity of symptoms.
- Treat adolescents as adults and individuals because they tend to respond best when treated as such.
- Remember that adolescents have the right to confidentiality. After talking with parents about historical information, make an opportunity to speak alone with adolescents.

Pediatric (Box 31-2) and geriatric (Box 31-3) assessments tools are used to document and evaluate changes in health status. In children the Rourke assists in the examination of normal growth and development in children. In the geriatric population, a functional assessment, evaluation of activities of daily living, might determine the need for assistance in the home.

Organization of the Examination

The physical examination is made up of individual assessments for each body system. Patients with specific symptoms or needs require only portions of an examination. A patient

► **TABLE 31-4** Positions for Examination

Position	Areas Assessed	Rationale	Limitations
Sitting 	Head and neck, back, posterior thorax and lungs, anterior thorax and lungs, breasts, axillae, heart, vital signs, and upper extremities	Sitting upright provides full expansion of lungs and provides better visualization of symmetry of upper body parts.	Physically weakened patient is sometimes unable to sit. Use supine position with head of bed elevated instead.
Supine 	Head and neck, anterior thorax and lungs, breasts, axillae, heart, abdomen, extremities, pulses	This is most normally relaxed position. It provides easy access to pulse sites.	If patient becomes short of breath easily, raise the head of bed.
Dorsal recumbent 	Head and neck, anterior thorax and lungs, breasts, axillae, heart, abdomen	Position is for abdominal assessment because it promotes relaxation of abdominal muscles.	Patients with painful disorders are more comfortable with knees flexed.
Lithotomy* 	Female genitalia and genital tract	This position provides maximal exposure of genitalia and facilitates insertion of vaginal speculum.	Lithotomy position is embarrassing and uncomfortable, so examiner minimizes time that patient spends in it. Keep patient well draped.
Sims' 	Rectum and vagina	Flexion of hip and knee improves exposure of rectal area.	Joint deformities hinder patient's ability to bend hip and knee.
Prone 	Musculoskeletal system	This position is only for assessing extension of hip joint, skin, buttocks.	Patients with respiratory difficulties do not tolerate this position well.
Lateral recumbent 	Heart	This position aids in detecting murmurs.	Patients with respiratory difficulties do not tolerate this position well.
Knee-chest* 	Rectum	This position provides maximal exposure of rectal area.	This position is embarrassing and uncomfortable.

*Some patients with arthritis or other joint deformities are unable to assume this position.

► **BOX 31-2** Developmental Assessment of Infants and Children

A good Canadian resource for the assessment of children is the Rourke Baby Record (Rourke et al., 2001). This tool provides information about growth and developmental milestones for children from birth to five years of age. The tool combines helpful information on nutrition, child safety, and the childhood immunization schedule. A Rourke Baby Record can be downloaded free from the Web site <http://www.rourkebabyrecord.ca/index.html>. Information about the tool development and associated evidence is also accessible from this Web site.

► **BOX 31-3** Geriatric Assessment Tools

A number of assessment tools are used with older adults to assess functional independence. Functional independence is the ability to perform basic personal care and activities and support independent living. Most often, functional assessment tools are used to assess older adults; however, younger individuals with spinal cord injuries or head injuries can be assessed using these tools as well.

Many screening tools are available that help nurses to assess their older adult patients' independence in the home, or their level of functioning on return home from hospital. Nurses who work with older adults should increase their knowledge about functional assessment tools (Ebersole et al., 2007). The Katz Index (Katz et al., 1963), although published a number of years ago, provides a simple screening evaluation of activities of daily living. Access to this tool is free from many sources online.

who comes to a clinic with symptoms of a severe chest cold will not routinely require a neurological assessment. A patient entering the emergency department with an acute illness requires assessment of the body systems most at risk for being abnormal. When a patient is admitted to the hospital, a

complete examination is performed. A patient who is receiving a routine health promotion examination undergoes specific preventive screenings, depending on the patient's age or health risk (Table 31-5). Patients with specific symptoms or needs often require only portions of an examination. Use

► **TABLE 31-5** Recommended Preventive Screenings

Screening Measure	All Ages	Ages 20-39	Ages 40-49	Ages 50-65	Ages 65+
Breast cancer		Self-exam and annual exam with health care practitioner	Self-exam and biannual exam with health care practitioner	Self-exam, biannual exam with health care practitioner Biannual mammography	Self-exam, biannual exam with health care practitioner Biannual mammography to age 70
Colon/rectal cancer				Biannual fecal occult blood	
Diabetes	Based on evidence suggesting risk	Based on evidence suggesting risk	Fasting plasma glucose every 3 years over the age of 40	Fasting plasma glucose every 3 years	Fasting plasma glucose every 3 years
Ear/Hearing disorders	Annually				Regular hearing assessment
Eye disorders	Every 3-5 years (more if positive history)		Biannually	Biannually	Annually
Cardiovascular disorders			Regular total cholesterol screening	Regular total cholesterol screening	Regular total cholesterol screening
Blood pressure	Start at age 5 years	Annually	Annually	Annually	Annually
Obesity/BMI		Annually	Annually	Annually	Annually
Oral cavity/pharyngeal disorders	Dental exam every 6 months				
Ovarian cancer		At age 18 years or on becoming sexually active	Annually	Annually	Annually
Prostate cancer				Men who have at least a 10-year life expectancy need to have a digital rectal examination (DRE) and prostate-specific antigen (PSA) blood test annually. Men at higher risk require earlier screening.	Men who have at least a 10-year life expectancy need to have a digital rectal examination (DRE) and prostate-specific antigen (PSA) blood test annually. Men at higher risk require earlier screening.
Skin cancer	Routine self-exam and annual health care practitioner exam				
Testicular cancer	Males age 15+ years and regular testicular self-examination (TSE)				
Uterine cancer		Annual health care practitioner exam at age 18 or upon becoming sexually active	Annual health care practitioner exam	Annual health care practitioner exam	Annual health care practitioner exam

Continued

► TABLE 31-5 Recommended Preventive Screenings—cont'd

Screening Measure	All Ages	Ages 20-39	Ages 40-49	Ages 50-65	Ages 65+
Cervical cancer		Screening with pelvic examination by health care provider plus an annual Papanicolaou (Pap) test begins 3 years after having vaginal intercourse, but not later than age 21. Frequency of 1-3 years, depending on provincial screening guidelines.	Papanicolaou (Pap) test frequency of 1-3 years, depending on provincial screening guidelines.	Papanicolaou (Pap) test frequency of 1-3 years, depending on provincial screening guidelines.	Papanicolaou (Pap) test frequency of 1-3 years, depending on provincial screening guidelines.
Endometrial cancer		Annual health care practitioner exam at age 18+, or on becoming sexually active.	Endometrial biopsy at age 35 for high-risk patients (those with or at risk for hereditary nonpolyposis colon cancer [HNPCC])	At menopause, women of average and high risk need to be informed about signs and symptoms to report.	

References: Canadian Cancer Society. (2001). See Web site for further information on preventative screenings: <http://www.cancer.ca>.
Hypertension Canada. See Web site for further information on preventative screenings: <http://hypertension.ca>.
Canadian Diabetes Association. (2008). See Web site for further information on preventative screenings: <http://www.diabetes.ca>.

judgement to ensure that an examination is relevant and includes the correct observations.

The performance of a complete health assessment follows the format of the nursing history (see Chapter 12). Obtain information from the history to focus attention on specific parts of the examination. Findings from the history generally reveal a pattern of related signs and symptoms. The physical examination supplements information from the history to confirm or refute the data.

Be systematic and well organized about the examination so you do not miss important assessments. A head-to-toe approach includes all body systems and helps to anticipate each step. In an adult, begin by assessing the head and neck structures, including hair and skin, and progressing methodically down the body to incorporate all body systems. The following tips help keep an examination well organized:

- Compare both sides of the body for symmetry. A degree of asymmetry is normal (e.g., the biceps muscles in the dominant arm are sometimes more developed than the same muscles in the nondominant arm).
- If a patient is seriously ill, first assess the systems of the body more at risk for being abnormal. For example, a patient with chest pain first undergoes a cardiovascular assessment.
- If a patient becomes fatigued, offer rest periods between assessments.
- Perform painful procedures near the end of the examination.
- Record assessments in specific terms on a physical assessment form or in the nurses' notes.

- Use common and accepted medical abbreviations to keep notes brief and concise.
- Record quick notes during the examination to avoid keeping the patient waiting. Complete any observations at the end of the examination.
- A physical assessment form allows you to record information in the same sequence as you gather it.

General Survey

Assessment begins when first meeting the patient. Determine the patient's reason for seeking health care. Initial data from the general survey begins with a review of the patient's primary health problems. Make mental notes of the patient's behaviour and appearance. Begin the examination with a general survey. The survey provides information about characteristics of an illness, a patient's hygiene and body image, emotional state, recent changes in weight, and developmental status. If there are abnormalities or problems, closely assess the affected body system later.

General Appearance and Behaviour

Assess appearance and behaviour while preparing the patient for the examination. The review of general appearance and behaviour includes the following:

- **Age and gender:** A person's gender and age affect the type of examination performed and the manner in which you make assessments. Physical characteristics offer clues that help guide your examination. Certain conditions are more likely to affect individuals of a specific gender or who have certain

physical characteristics; for example, breast cancer is more common in women than men, and the incidence of skin cancer is higher in individuals who have fair complexions.

- **Signs of distress:** There are sometimes obvious signs or symptoms indicating pain (grimacing, splinting painful area) or difficulty in breathing (shortness of breath, sternal retractions) or anxiety. These signs establish priorities regarding what to examine first.
- **Body type:** Observe if a patient appears trim and muscular, obese, or excessively thin. Body type reflects the level of health, age, and lifestyle.
- **Posture:** Normal standing posture is an upright stance with parallel alignment of the hips and shoulders. Normal sitting posture involves some degree of rounding of the shoulders. Observe whether the patient has a slumped, erect, or bent posture. Posture often reflects mood or pain. Many older adults assume a stooped, forward-bent posture, with the hips and knees somewhat flexed and the arms bent at the elbows, raising the level of the arms.
- **Gait:** Observe the patient walking into the room or at the bedside (if the patient is ambulatory). Note whether movements are coordinated or uncoordinated. A person normally walks with the arms swinging freely at the sides, with the head and face leading the body.
- **Body movements:** Observe whether movements are purposeful, and note if there are any tremors involving the extremities. Determine if any body parts are immobile.
- **Hygiene and grooming:** Note the patient's level of cleanliness by observing the appearance of the hair, skin, and fingernails. Note if the patient's clothes are clean. Grooming depends on the activities being performed just before the examination, as well as the patient's occupation. Also note the amount and type of cosmetics used.
- **Dress:** Culture, lifestyle, socioeconomic level, and personal preference affect the type of clothes worn. Note if the type of clothing worn is appropriate for the temperature and weather conditions. Depressed or mentally ill individuals are often unable to choose proper clothing. An older adult tends to wear extra clothing because of the sensitivity to cold.
- **Body odour:** An unpleasant body odour often results from physical exercise, poor hygiene, or certain disease states.
- **Affect and mood:** Affect is a person's feelings as they appear to others. Patients express mood or emotional state verbally and nonverbally. Note if verbal expressions match nonverbal behaviour. Observe if mood is appropriate for the situation. Observe facial expressions while asking questions.
- **Speech:** Normal speech is understandable and moderately paced. It shows an association with the person's thoughts. Note if the patient talks rapidly or slowly. Emotions or neurological impairment sometimes cause an abnormal pace. Observe whether the patient speaks in a normal tone with clear inflection of words.
- **Patient abuse:** Abuse of children, women, and older adults is a growing health problem. Obvious physical injury or neglect are signs of possible abuse (e.g., evidence of malnutrition or presence of bruising on the extremities or trunk). Assess for the patient's fear of the spouse or partner, caregiver, parent, or adult child. Note if the partner or caregiver has a history of violence, alcoholism, or drug abuse. Is the person unemployed, ill, or frustrated in caring for the patient? Most provinces mandate a report to a social service agency if you suspect abuse or neglect (Box 31-4). When

► BOX 31-4 Clinical Indicators of Abuse

Physical Findings

Child Sexual Abuse

Vaginal or penile discharge
Blood on underclothing
Pain, itching, or unusual odour in genital area
Genital injuries
Difficulty sitting or walking
Pain while urinating; recurrent urinary tract infections
Foreign bodies in rectum, urethra, or vagina
Sexually transmitted infections
Pregnancy in young adolescent

Behavioural Findings

Problem in sleeping or eating
Fear of certain people or places
Play activities re-create the abuse situation
Regressed behaviour
Sexual acting out
Knowledge of explicit sexual matters
Preoccupation with others' or own genitals
Profound and rapid personality changes
Rapidly declining school performance
Poor relationship with peers

Domestic Abuse

Injuries and trauma are inconsistent with reported cause
Multiple injuries involving head, face, neck, breasts, abdomen, and genitalia (black eyes, orbital fractures, broken nose, fractured skull, lip lacerations, broken teeth, strangulation marks)
X-ray films show old and new fractures in different stages of healing
Abrasions, lacerations, bruises/welts
Burns
Human bites

Attempted suicide
Eating or sleeping disorders
Anxiety
Panic attacks
Pattern of substance abuse (follows physical abuse)
Low self-esteem
Depression
Sense of helplessness
Guilt
Increased forgetfulness
Stress-related complaints (headache, anxiety)

Older Adult Abuse

Injuries and trauma are inconsistent with reported cause (cigarette burn, scratch, bruise, or bite)
Hematomas
Bruises at various stages of resolution
Bruises, chafing, excoriation on wrist or legs (restraints)
Burns
Fractures inconsistent with cause described
Dried blood

Dependent on caregiver
Physically and/or cognitively impaired
Combative
Wandering
Verbally aggressive
Minimal social support
Prolonged interval between injury and medical treatment

Data from Kovach, K. (2004). Intimate partner violence. *RN*, 67(8), 38; Quinn, M. J. (2002). Undue influence and elder abuse: Recognition and intervention strategies. *Geriatric Nursing*, 23(1), 11–16; Fulmer, T. (2003). Elder abuse and neglect assessment. *Journal of Gerontological Nursing*, 29(1), 8–9; and Hockenberry, M. J., & Wilson, P. (Eds.). (2007). *Wong's nursing care of infants and children* (8th ed.). St. Louis, MO: Mosby.

you suspect abuse, interview the patient in private. It is difficult to detect abuse, because victims often will not complain or report that they are in an abusive situation (Witte, 2009). Patients are more likely to reveal any problems when the suspected abuser is absent from the room (Witte, 2009).

► BOX 31-5

Red Flags for Suspicion of Substance Abuse

- Patients who frequently miss appointments
- Patients who frequently request written excuses for absence from work
- Patients who have chief complaints of insomnia, “bad nerves,” or pain that does not fit a particular pattern
- Patients who often report lost prescriptions (e.g., tranquilizers or pain medications) or ask for frequent refills
- Patients who make frequent emergency department visits
- Patients who have a history of changing health care providers or who bring in medication bottles prescribed by several different providers
- Patients with a history of gastrointestinal bleeds, peptic ulcers, pancreatitis, cellulitis, or frequent pulmonary infections
- Patients with frequent sexually transmitted infections (STIs), complicated pregnancies, multiple abortions, or sexual dysfunction
- Patients who complain of chest pains or palpitations or who have a history of admissions to rule out myocardial infarctions
- Patients who give histories of activities that place them at risk for human immunodeficiency virus (HIV) infections (multiple partners, multiple rapes)
- Patients with a family history of addiction; history of childhood sexual, physical, or emotional abuse; or social and financial or marital problems

If two or more of the CAGE questions are positive, strongly suspect substance abuse and consider how to motivate the patient to seek treatment.

Data from American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders (DSM-IV-TR)*. Washington, DC: Author; Reis, R. K., Fiellin, D. A., Miller, S. C., & Saitz, R. (Eds.). (2009). *Principles of addiction medicine: The essentials* (4th ed.). Philadelphia, PA: Lippincott Williams & Wilkins; and Widlitz, M., & Marin, D. (2002). Substance abuse in older adults: An overview. *Geriatrics*, 57(12), 29–34.

safety alert The risk for further abuse is high once the victim has reported the abuse or tries to leave the abusive situation. Provide counselling options for these individuals.

- **Substance abuse:** Substance abuse affects all socioeconomic groups. A single visit to a clinic does not always reveal the problem. Several visits often reveal behaviours that you can confirm with a well-focused history and physical examination. Approach the patient in a caring and nonjudgemental way, because issues of substance abuse involve both emotional and lifestyle issues. Box 31-5 lists patients to suspect for substance abuse. When you suspect substance abuse, ask the following CAGE questions (CAGE is an acronym for the following):
 - Have you ever felt the need to **Cut down** on your drinking or drug use?
 - Have people **Annoyed** you by criticizing your drinking or drug use?
 - Have you ever felt bad or **Guilty** about your drinking or drug use?
 - Have you ever used or had a drink first thing in the morning as an **Eye-opener** to steady your nerves or feel normal?

Vital Signs

Assessment of vital signs (see Chapter 30) is the first part of the physical examination. Positioning or moving the patient during the examination interferes with obtaining accurate values. You can also measure specific vital signs during assessment of individual body systems.

Height and Weight

Height and weight reflect a person's general level of health. Weight is a routine measure during health screenings and visits to physicians' offices or clinics. Both measures are routine when patients are admitted to a health care setting. Health care providers measure an infant or child's height and weight to assess growth and development. In older adults, height and weight coupled with a nutritional assessment determine the cause of and treatment for chronic disease or help to identify the older adult who has difficulty with feeding and other functional activities. Be sure to look for overall trends in height and weight as changes can be indicative of health problems.

A patient's weight will normally vary daily because of fluid loss or retention. A downward trend in a frail older adult indicates serious reduction in nutritional reserves. Assessments screen for abnormal weight changes. The nursing history helps to focus on possible causes for a change in weight (Table 31-6). First ask the patient his or her current height and weight. Also assess weight gains or losses. A weight gain of 2.3 kg (5 lb) in a day indicates fluid retention problems. If the patient has lost more than 5% of body weight in a month or 10% in six months, the loss is significant.

Body mass index (BMI) tables help reveal the normal expected weight range for a patient at a given height (Figure 31-3). The body mass index uses waist circumference of adults to measure the health risk associated with obesity. A patient's waist is measured midway between the costal margin and the iliac crest. Measurement should be taken to the nearest 0.5 cm at the end of expiration. The tape measure should fit snugly but should not compress soft tissue. Locating the intersection of the patient's height and weight on the BMI table will indicate the patient's BMI. The risk for health based on this value can be assessed using the BMI categories. Patients at high risk should be encouraged to seek the care of a health care practitioner for weight loss, dietary changes, and exercise programs.

You need to weigh patients at the same time of day, on the same scale, and in the same clothes to allow an objective comparison of subsequent weights. Accuracy of weight measurement is important because health care providers will base medical and nursing decisions (e.g., drug dosage determinations, lifting, and positioning) on changes. Patients capable of bearing their own weight use a standing scale. Calibrate a standard platform scale by moving the large and small weights to zero. Make the balance beam level and steady by adjusting the calibrating knob. The patient stands on the scale platform and remains still. Move the largest weight to the 22.5 kg increment under the patient's weight. Then adjust the smaller weight to balance the scale at the nearest 0.1 kg (Jarvis et al., 2009). Electronic scales automatically display the weight within seconds. Electronic scales are automatically calibrated each time they are used.

Stretcher and chair scales are available for patients unable to bear weight. After you transfer the patient to the scale, a hydraulic device lifts the patient above the bed and measures the weight on a balance beam or digital display. Use caution when transferring patients to and from the scales.

▶ TABLE 31-6

Nursing History for Weight Assessment

Assessment Category

Ask about total weight lost or gained; compare with usual weight; note time period for loss (e.g., gradual, sudden, desired, or undesired).

If weight loss desired, ask about eating habits, diet plan followed, food preparation, calorie intake, appetite, exercise pattern, support group participation, weight goal.

If weight loss undesired, ask about anorexia, vomiting, diarrhea, thirst, frequent urination, and change in lifestyle, activity, and stress levels.

Assess if patient has noted changes in social aspects of eating: more meals in restaurants, rushing to eat meals, stress at work, or skipping meals.

Assess if patient takes chemotherapy, diuretics, insulin, fluoxetine, prescription and nonprescription appetite suppressants, laxatives, oral hypoglycemics, and herbal supplements (weight loss); steroids, oral contraceptives, antidepressants, insulin (weight gain).

Assess for preoccupation with body weight or body shape such as fasting, never feeling thin enough, unusually strict caloric intake or restrictions, laxative abuse, induced vomiting, amenorrhea, excessive exercise, alcohol intake.

Rationale

Determines severity of problem and reveals if weight change is related to disease process, change in eating pattern, or pregnancy.

Helps to determine appropriateness of diet plan followed.

Focuses on problems that cause weight loss (e.g., gastrointestinal problems).

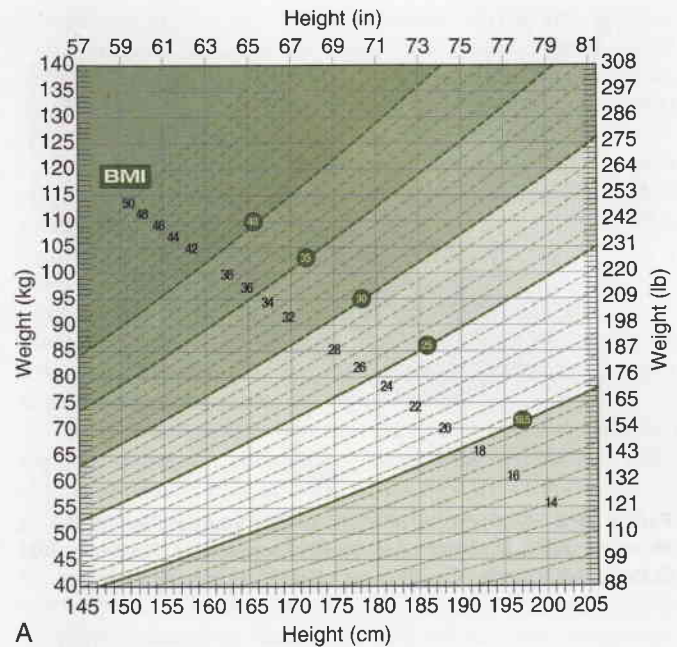
Lifestyle changes sometimes contribute to weight changes.

Weight gain or loss is a side effect of these medications.

Indicates an eating disorder.

Always weigh infants in baskets or on platform scales. Remove the infant's clothing, and weigh the infant in dry, disposable diapers. Adjust the measurement later for the weight of the diaper, ensuring an accurate reading. Keep the room warm to prevent chills. A light cloth or paper placed on the scale's surface prevents cross-infection from urine or feces. When placing infants in baskets or on platforms, hold a hand lightly above to prevent accidental falls. You measure weight in grams.

To measure the height of weight-bearing patients, have them remove their shoes. Place a paper towel on the scale platform or floor so the patient's feet remain clean. A measuring stick or tape is attached vertically to the weight scales or wall. Have the patient stand erect. The platform scale has a metal rod attached to the back of the scale; this swings out and over the crown of the head. You can also place a measuring stick or flat book on the head when a scale is unavailable. With the rod or stick placed level horizontally at a 90-degree angle to the measuring stick, measure the patient's height in centimetres.



A

Waist circumference	BMI category		
	Normal 18.5–24.9 kg/m ²	Overweight 25–29.9 kg/m ²	Obese class I 30–34.9 kg/m ²
Men: < 102 cm Women: < 88 cm	Least risk	Increased risk	High risk
Men: ≥ 102 cm Women: ≥ 88 cm	Increased risk	High risk	Very high risk

B

Figure 31-3 Height and weight measures: Weights for people over 18 years (excluding pregnant or lactating women)

- Weight and height are required to measure a person's BMI, which is calculated by dividing weight (kg) by height squared (m²).
- Weight is measured with the patient wearing light clothing and no footwear and is recorded to the nearest 0.2 kg.
- Height is measured with the person wearing no shoes, standing in an erect position, looking straight ahead with feet together and heels against a wall or measuring board. A horizontal bar or other similar device should be lowered so that it rests flat on top of the person's head. Height is recorded to the nearest 0.5 cm.
- For a quick determination of BMI, use a straight-edge to help locate the point on the chart below where height and weight intersect. Read the number on the dashed line closest to this point. For example, a person who weighs 69 kg and is 173 cm tall has a BMI of about 23.

NOTE: The BMI cannot be used to distinguish between increased body weight due to adiposity or fluid retention (e.g., peripheral edema), although this distinction should be apparent clinically. The BMI may have limitations in people who are very muscular or very lean, in those who are very tall or very short, in people with long limb lengths relative to trunk size (e.g., those with Marfan syndrome) and in people with short limb lengths relative to trunk size (e.g., those with achondroplasia). **Source:** A, Health Canada (2003). *Canadian guidelines for body weight classification in adults* (Catalogue no. H49-179/2003E; p. 37). Ottawa: Health Canada. Retrieved from http://www.hc-sc.gc.ca/fn-an/nutrition/weights-poids/guide-ld-adult/cg_quick_ref-ldc_rapide_ref-eng.php; and B, Douketis, J. D., Paradis, G., Keller, H., & Martineau, C. (2005). Canadian guidelines for body weight classification in adults: Application in clinical practice to screen for overweight and obesity and assess disease risk. *Canadian Medical Association Journal*, 172(8), 995–998.



Figure 31-4 Measurement of infant length. **Source:** From Seidel, H. M., et al. (2011). *Mosby's guide to physical examination* (7th ed., p. 103). St Louis, MO: Mosby. Courtesy seca GmbH, Hamburg, Germany.

Remove the shoes of a non-weight-bearing patient, and position the patient (such as an infant) supine on a firm surface. Portable devices are available that provide a reliable means to measure height. Place the infant on the device, having the parent hold the infant's head against the headboard. With the infant's legs straight at the knees, place the footboard against the bottom of the infant's feet (Figure 31-4). Record the infant's length to the nearest 0.5 cm.

The Integumentary System: Skin, Hair, and Nails

The **integument** consists of the skin, hair, scalp, and nails. Developing a routine approach to physical assessment helps to ensure the completeness of your exam. For the purposes of presentation in this chapter, the approach to patient assessment begins with the inspection of all skin surfaces. Alternatively, as your assessment skills develop, you may choose to assess the skin gradually while examining other body systems (e.g., inspecting the skin of the torso while assessing the respiratory, cardiovascular, and abdominal systems). Use the skills of inspection, palpation, and olfaction to assess the integument's function and integrity.

Skin

Assessment of the skin reveals changes in oxygenation, circulation, nutrition, local tissue damage, and hydration. In a hospital setting, the majority of patients are older adults, debilitated patients, or young but seriously ill patients. There are significant risks for skin lesions resulting from trauma to the skin during administration of care, from exposure to pressure during immobilization, or from reaction to various medications used in treatment. Patients at high risk are the neurologically impaired, chronically ill, and orthopedic patients. Others at risk are patients with diminished mental status, poor tissue oxygenation, low cardiac output, or inadequate nutrition. In nursing homes and extended care facilities, patients are often at risk for many of the same problems, depending on their level of mobility and the presence of chronic illness. Routinely assess the skin to look for primary or initial lesions that

* BOX 31-6 PATIENT TEACHING

Skin Assessment

Objectives

- Patient will perform a monthly self-examination of the skin.
- Patient will identify factors that increase the risk of skin cancer.
- Patient will follow hygiene practices aimed at maintaining skin integrity.

Teaching Strategies

- Instruct patient to conduct a complete monthly self-examination of the skin, noting moles, blemishes, and birthmarks. Tell patient to inspect all skin surfaces. Cancerous melanomas start as small, molelike growths that increase in size, change colour, become ulcerated, and bleed (see Box 31-10, p. 557).
- Tell patient to report to a physician or health care provider any change in skin lesions or a sore that does not heal.
- Instruct patient to report to a physician any lesion that bleeds or fails to heal. Especially instruct older adults, who tend to have delayed wound healing.
- To treat excessively dry skin, tell patient to avoid hot water, harsh soaps, and drying agents such as rubbing alcohol. Use a superfatted (Dove) soap, and pat rather than rub the skin after bathing.
- Apply moisturizers (mineral oil) to the skin regularly to reduce itching and drying, and wear cotton clothing (Marks & Miller, 2006).

Evaluation

- Observe patient performing a skin assessment.
- Have the patient describe signs of skin cancer and measures to take to prevent skin cancer.
- Ask the patient to describe methods for keeping the skin lubricated and supple.

develop. Without proper care, primary lesions can deteriorate to become secondary lesions that require more extensive nursing care. The development of a pressure ulcer, for example, will lengthen a hospital stay unless you prevent or discover it early and treat it properly (see Chapter 46).

It was estimated that approximately 5300 new cases of **melanoma**, an aggressive form of skin cancer, would be diagnosed in 2010 (Canadian Cancer Society [CCS] Steering Committee, 2010). In addition, health care providers could expect to see approximately 75,000 new cases of the highly curable basal cell and squamous cell cancers (CCS Steering Committee, 2010). Cutaneous malignancies are the most common neoplasms seen in patients. Incorporate performing a thorough skin assessment on all patients with educating them about self-examination (Box 31-6).

The condition of the patient's skin reveals the need for nursing intervention. Use assessment findings to determine the type of hygiene measures required to maintain integrity of the integument (see Chapter 37). Adequate nutrition and hydration become goals of therapy if you identify an alteration in the integument's status (see Chapter 42).

You need adequate lighting to accurately observe a patient's skin. The recommended choice is natural or halogen lighting. For detecting skin changes in the dark-skinned patient, sunlight is the best choice (Marks & Miller, 2006). Room

temperature also affects skin assessment. A room that is too warm causes **superficial vasodilation**, resulting in an increased redness of the skin. A cool environment causes the sensitive patient to develop **cyanosis** (bluish discoloration) around the lips and nail beds.

Use disposable gloves for palpation if open, moist, or draining lesions are present. Although you inspect each part of the body during an examination, it is helpful to make a brief but careful overall visual sweep of the entire body. This provides a good idea of the distribution and extent of any lesions, as well as the overall symmetry of skin colour. Because you need to inspect all skin surfaces, the patient will assume several positions. Table 31-7 outlines the nursing history for skin

assessment. If you notice abnormalities during an examination, palpate the involved areas. Skin odours are usually apparent in the folds of the skin, such as the axillae or under the female patient's breasts. Figure 31-5 illustrates a normal cross-section of the skin.

Colour. Skin colour varies from body part to body part and from person to person. Despite individual variations, skin colour is usually uniform over the body. Table 31-8 lists common variations. Normal skin **pigmentation** ranges in tone from ivory or light pink to ruddy pink in light skin and from light to deep brown or olive in dark skin. In older adults, pigmentation increases unevenly, causing discoloured skin. While inspecting the skin, be aware that cosmetics or tanning agents sometimes mask colour.

The assessment of colour first involves areas of the skin not exposed to the sun, such as the palms of the hands. Note if the skin is unusually pale or dark. Areas exposed to the sun, such as the face and arms, will be darker. It is more difficult to note changes such as pallor or cyanosis in patients with dark skin tones. Usually you see colour hues best in the palms, soles of the feet, lips, tongue, and nail beds. Areas of increased colour (hyperpigmentation) and decreased colour (hypopigmentation) are common. Skin creases and folds are darker than the rest of the body in the dark-skinned patient.

Inspect sites where you are able to identify abnormalities more easily. For example, you can see pallor more easily in the face, buccal (mouth) mucosa, conjunctiva, and nail beds. Observe for cyanosis in the lips, nail beds, palpebral conjunctivae, and palms. In recognizing pallor in the dark-skinned patient, observe that normal brown skin appears to be yellow-brown and normal black skin appears to be ashen grey. Also assess the lips, nail beds, and mucous membranes for generalized pallor; if pallor is present, the mucous membranes will be ashen grey. Assessment of cyanosis in the dark-skinned patient requires observation of areas where pigmentation occurs the least (conjunctiva, sclera, buccal mucosa, tongue, lips, nail beds, and palms and soles). In addition, verify these findings with clinical manifestations (Marks & Miller, 2006).

The best site to inspect for **jaundice** (yellow-orange discoloration) is the patient's sclera. You can see normal reactive hyperemia, or redness, most often in regions exposed to pressure such as the sacrum, heels, and greater trochanter. Inspect for any patches or areas of skin colour variation. Localized skin changes, such as pallor or **erythema** (red discoloration),

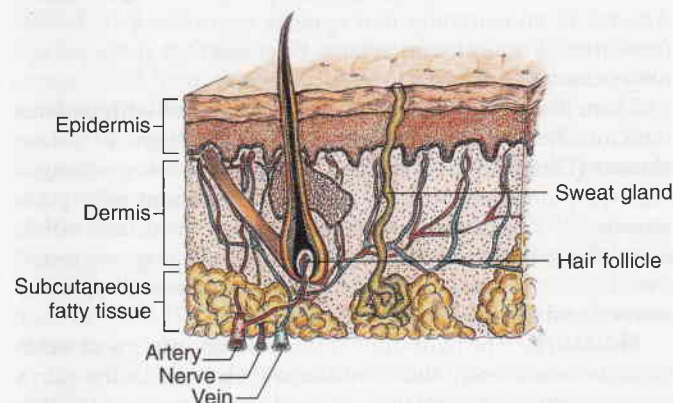


Figure 31-5 A cross-section of the skin reveals three layers: epidermis, dermis, and subcutaneous fatty tissues.

TABLE 31-7 Nursing History for Skin Assessment

Assessment Category

Rationale

Ask patient about history of changes in the skin: dryness, pruritus, sores, rashes, lumps, colour, texture, odour, lesion that does not heal.

Patient is best source to recognize change. Usually skin cancer is first noticed as a localized change in skin colour.

Consider if the patient has the following history: fair, freckled, ruddy complexion; light-coloured hair or eyes; tendency to burn easily.

Characteristics are risk factors for skin cancer.

Determine whether patient works or spends excessive time outside. If so, ask whether patient wears sunscreen and the level of protection.

Exposed areas such as face and arms will be more pigmented than rest of body. The Canadian Cancer Society (2012b) recommends use of sunscreen.

Determine whether patient has noted lesions, rashes, or bruises.

Most skin changes do not develop suddenly. Change in character of lesion possibly indicates cancer. Bruising indicates trauma or bleeding disorder.

Question patient about frequency of bathing and type of soap used.

Excessive bathing and use of harsh soaps cause dry skin.

Ask if patient has had recent trauma to skin.

Some injuries cause bruising and changes in skin texture.

Determine whether patient has history of allergies.

Skin rashes commonly occur from allergies.

Ask if patient uses topical medications or home remedies on skin.

Incorrect use of topical agents causes inflammation or irritation.

Ask if patient goes to tanning parlours, uses sun lamps, or takes tanning pills.

Overexposure of skin to these irritants will possibly cause skin cancer.

Ask if patient has family history of serious skin disorders such as skin cancer or psoriasis.

Family history will possibly reveal information about patient's condition.

Determine if patient works with creosote, coal, tar, petroleum products, arsenic compounds, or radium.

Exposure to these agents creates risk for skin cancer.

► TABLE 31-8 Skin Colour Variations

Colour	Condition	Causes	Assessment Locations
Bluish (cyanosis)	Increased amount of deoxygenated hemoglobin (associated with hypoxia)	Heart or lung disease, cold environment	Nail beds, lips, mouth, skin (severe cases)
Pallor (decrease in colour)	Reduced amount of oxyhemoglobin	Anemia	Face, conjunctivae, nail beds, palms of hands
	Reduced visibility of oxyhemoglobin resulting from decreased blood flow	Shock	Skin, nail beds, conjunctivae, lips
Loss of pigmentation	Vitiligo	Congenital or autoimmune condition causing lack of pigment	Patchy areas on skin over face, hands, arms
Yellow-orange (jaundice)	Increased deposit of bilirubin in tissues	Liver disease, destruction of red blood cells	Sclera, mucous membranes, skin
Red (erythema)	Increased visibility of oxyhemoglobin caused by dilation or increased blood flow	Fever, direct trauma, blushing, alcohol intake	Face, area of trauma, sacrum, shoulders, other common sites for pressure ulcers
Tan-brown	Increased amount of melanin	Suntan, pregnancy	Areas exposed to sun: face, arms, areolae, nipples

► TABLE 31-9 Physical Findings of the Skin Indicative of Substance Abuse

Body System	Commonly Associated Drug
Diaphoresis	Sedative hypnotic (including alcohol)
Spider angiomas	Alcohol, stimulants
Burns (especially fingers)	Alcohol
Needle marks	Opioids
Contusion, abrasions, cuts, scars	Alcohol, other sedative hypnotics
"Homemade" tattoos	Cocaine, intravenous (IV) opioids (prevents detection of injection sites)
Increased vascularity of face	Alcohol
Red, dry skin	Phencyclidine (PCP)

Data from Reis, R. K., Fiellin, D. A., Miller, S. C., & Saitz, R. (Eds.) (2009). *Principles of addiction medicine: The essentials* (4th ed.). Philadelphia, PA: Lippincott Williams & Wilkins; and Smith, D. E., & Seymour, R. B. (2001). *Clinician's guide to substance abuse*. New York: McGraw-Hill.

indicate circulatory changes. For example, an area of erythema is due to localized vasodilation resulting from a sunburn, inflammation, or fever. It is difficult to observe erythema in the dark-skinned patient, so palpate the area for heat and warmth to note the presence of skin inflammation (Jarvis et al., 2009). An area of an extremity that appears unusually pale results from arterial occlusion or edema. Be sure to ask if the patient has noticed any changes in skin colouring.

There is also a pattern of findings associated with patients who are chemically dependent or are intravenous (IV) drug abusers (Table 31-9). It is sometimes difficult to recognize signs and symptoms after one examination. A patient who takes repeated IV injections has edematous, reddened, and warm areas along the arms and legs. This pattern suggests recent injections. Evidence of old injection sites appears as hyperpigmented and shiny or scarred areas.

Moisture. The hydration of skin and mucous membranes helps to reveal body fluid imbalances, changes in the skin's environment, and regulation of body temperature. Moisture refers to wetness and oiliness. The skin is normally smooth and dry. Skin folds such as the axillae are normally moist. Minimal perspiration or oiliness is often present (Jarvis et al.,

2009). Increased perspiration is sometimes associated with activity, warm environments, obesity, anxiety, or excitement. Use ungloved fingertips to palpate skin surfaces and observe for dullness, dryness, crusting, and flaking. Flaking is the appearance of flakes resembling dandruff when the skin surface is lightly rubbed. Scaling involves fishlike scales that are easily rubbed off the skin's surface. Both flaking and scaling indicate abnormally dry skin. Excessively dry skin is common in older adults and individuals who use excessive amounts of soap during bathing. Other factors causing dry skin include lack of humidity, exposure to sun, smoking, stress, excessive perspiration, and dehydration. Excessive dryness worsens existing skin conditions such as **eczema** and **dermatitis**.

Temperature. The temperature of the skin depends on the amount of blood circulating through the dermis. Increased or decreased skin temperature indicates an increase or decrease in blood flow. An increase in skin temperature often accompanies localized erythema or redness of the skin. A reduction in skin temperature reflects a decrease in blood flow. It is important to remember that if an examination room is cold, this will affect the patient's skin temperature and colour.

Accurately assess temperature by palpating the skin with the dorsum, or back of the hand. Compare symmetrical body parts. Normally the skin temperature is warm. Sometimes skin temperature is the same throughout the body, and other times it varies in one area. Always assess skin temperature for patients at risk of having impaired circulation, such as after a cast application or vascular surgery. You can identify a stage I pressure ulcer early by noting warmth and erythema on an area of the skin (see Chapter 46).

Texture. The character of the skin's surface and the feel of deeper portions are its texture. Determine whether the patient's skin is smooth or rough, thin or thick, tight or supple, and **indurated** (hardened) or soft by stroking it lightly with the fingertips. The texture of the skin is normally smooth, soft, even, and flexible in children and adults. However, the texture is usually not uniform throughout. The palms of the hand and soles of the feet tend to be thicker. In older adults the skin becomes wrinkled and leathery because of a decrease in collagen, subcutaneous fat, and sweat glands.

Localized changes result from trauma, surgical wounds, or lesions. When finding irregularities in texture such as scars or induration, ask the patient if a recent injury to the skin has



Figure 31-6 Assessment for skin turgor. **Source:** From Seidel, H. M., et al. (2011). *Mosby's guide to physical examination* (7th ed., p. 164). St Louis, MO: Mosby.

occurred. Deeper palpation sometimes reveals irregularities such as tenderness or localized areas of induration commonly caused by repeated injections.

Turgor. Turgor is the skin's elasticity. Edema or dehydration diminish turgor. Normally the skin loses its elasticity with age. To assess the skin turgor, grasp a fold of skin on the back of the forearm or sternal area with the fingertips and release (Figure 31-6). Normally the skin lifts easily and snaps back immediately to its resting position. The back of the hand is not the best place to test for turgor, because the skin is normally loose and thin (Seidel et al., 2011). The skin stays pinched when turgor is poor. Note the ease with which the skin moves and the speed at which it returns to place. Failure of the skin to reassume its normal contour or shape indicates dehydration. The patient with poor skin turgor does not have a resilience to the normal wear and tear on the skin. The skin tends to stay pinched or tented when turgor is poor. A decrease in turgor predisposes the patient to skin breakdown.

Vascularity. The circulation of the skin affects colour in localized areas and the appearance of superficial blood vessels. With aging, capillaries become fragile. Localized pressure areas, found after a patient has remained in one position, appear reddened, pink, or pale (see Chapter 46). **Petechiae** are pinpoint-sized, red or purple spots on the skin caused by small hemorrhages in the skin layers. Petechiae do not blanch but may indicate serious blood-clotting disorders, drug reactions, or liver disease.

Edema. Areas of the skin become swollen or edematous from a buildup of fluid in the tissues. Direct trauma and impairment of venous return are two common causes of edema. Inspect edematous areas for location, colour, and shape. The formation of edema separates the skin's surface from the pigmented and vascular layers, masking skin colour. Edematous skin also appears stretched and shiny. Palpate edematous areas to determine mobility, consistency, and tenderness. When pressure from the examiner's fingers leaves an indentation in the edematous area, it is called pitting edema. To assess the degree of pitting edema, press the edematous area firmly with the thumb for several seconds and release. The depth of pitting, recorded in millimetres, determines the degree of edema (Seidel et al., 2011). For example, 1+ edema equals a 2-mm depth, 2+ edema equals a 4-mm depth, 3+ equals 6 mm, and 4+ equals 8 mm (see Figure 31-55, p. 589).

Lesions. The skin is normally free of lesions, except for common freckles or age-related changes such as skin tags, **senile keratosis** (thickening of skin), **cherry angiomas** (ruby-red papules), and atrophic warts. Lesions are primary (occurring as initial spontaneous manifestations of a pathological process), such as an insect bite, or secondary (resulting from later formation or trauma to a primary lesion), such as a pressure ulcer. When you detect a lesion, inspect it for colour, location, texture, size, shape, type, grouping (clustered or linear), and distribution (localized or generalized). Observe any exudate for colour, odour, amount, and consistency. Measure the size of the lesion by using a small, clear, flexible ruler divided in centimetres. Comparing a lesion with a household measure, such as a coin or eraser, is not reliable (Seidel et al., 2011). Measure lesions in height, width, and depth.

Palpation determines the lesion's mobility, contour (flat, raised, or depressed), and consistency (soft or indurated). Certain types of lesions present a characteristic pattern. For example, a tumour is usually an elevated, solid lesion larger than 2 cm. Primary lesions, such as macules and nodules, come from some stimulus to the skin (Box 31-7). Secondary lesions, such as ulcers, occur as alterations in primary lesions. After you identify a lesion, closely inspect it in good lighting. Palpate gently, covering the entire area of the lesion. If the lesion is moist or draining fluid, wear gloves during palpation.

Note if the patient complains of tenderness during palpation. Cancerous lesions frequently undergo changes in colour and size (Box 31-8). **Basal cell carcinoma** is most common in sun-exposed areas and frequently occurs in a background of sun-damaged skin; it almost never spreads to other parts of the body. **Squamous cell carcinoma** is more serious than basal cell and develops on the outer layers of sun-exposed skin; these cells may travel to lymph nodes and throughout the body. Report abnormal lesions to the health care provider for further examination.

Every nurse should be able to perform a complete examination of the skin and recognize abnormalities. Box 31-9 presents patient education that nurses should communicate while performing an examination of the integumentary system and in discussions about health screening.

safety alert Individuals exposed to the sun through sunbathing or artificial means increase their risk for development of skin cancer. Provide appropriate teaching to inform patients of ways to decrease their risk (see Boxes 31-6 and 31-8).

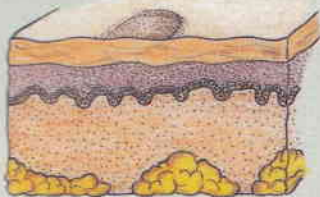
Hair and Scalp

The following types of hair cover the body: terminal hair (long, coarse, thick hair easily visible on the scalp, axillae, pubic areas, and in the beard in men) and vellus hair (small, soft, tiny hairs covering the whole body except for the palms and soles). Inspecting the condition and distribution of hair and the integrity of the scalp requires good lighting.

Inspection. During inspection, explain that it is necessary to separate parts of the hair to detect abnormalities. If lesions or lice are probable, wear clean gloves to avoid infection. Table 31-10 describes the nursing history for assessment of the hair and scalp.

First inspect the colour, distribution, quantity, thickness, texture, and lubrication of body hair. Scalp hair is coarse or fine; curly or straight; and should be shiny, smooth, and pliant. While separating sections of scalp hair, observe characteristics of colour and coarseness. Colour varies from very light blond

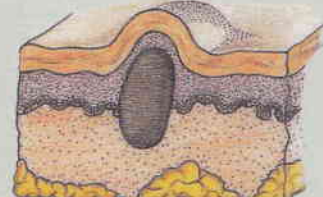
► BOX 31-7 Types of Primary Skin Lesions



Macule: Flat, nonpalpable change in skin colour, smaller than 1 cm (e.g., freckle, petech)



Papule: Palpable, circumscribed, solid elevation in skin, smaller than 1 cm (e.g., elevated nevus)



Nodule: Elevated solid mass, deeper and firmer than papule, 1–2 cm (e.g., wart)



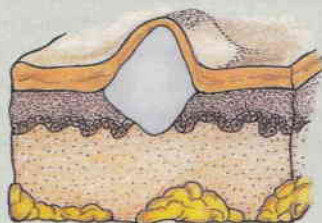
Tumour: Solid mass that extends deep through subcutaneous tissue, larger than 1–2 cm (e.g., epithelioma)



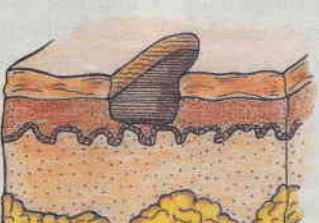
Wheal: Irregularly shaped, elevated area or superficial localized edema; varies in size (e.g., hive, mosquito bite)



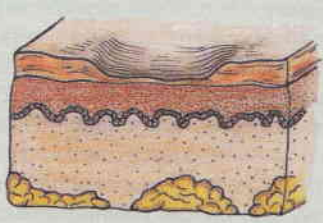
Vesicle: Circumscribed elevation of skin filled with serous fluid, smaller than 1 cm (e.g., herpes simplex, chicken pox)



Pustule: Circumscribed elevation of skin similar to vesicle but filled with pus; varies in size (e.g., acne, staphylococcal infection)



Ulcer: Deep loss of skin surface that extends to dermis and frequently bleeds and scars; varies in size (e.g., venous stasis ulcer)



Atrophy: Thinning of skin with loss of normal skin furrow, with skin appearing shiny and translucent; varies in size (e.g., arterial insufficiency)

to black to grey and sometimes shows alterations from rinses or dyes. In older adults, the hair becomes dull grey, white, or yellow. The hair also thins over the scalp, axillae, and pubic areas. Older men often lose facial hair, whereas some older women develop hair on the chin and upper lip.

Be aware of the normal distribution of hair growth in a man and a woman. At puberty, a change in the amount and distribution of hair growth occurs. Some patients with hormone disorders experience an unusual distribution and growth. A woman with **hirsutism** has hair growth on the upper lip, chin, and cheeks, with vellus hair becoming coarser over the body. For some, a change in hair growth negatively affects body image and emotional well-being.

Some changes occur in the thickness, texture, and lubrication of scalp hair. Disturbances such as a febrile illness or scalp disease sometimes result in hair loss. Conditions such as thyroid disease alter the condition of the hair, making it fine and brittle. Hair loss (**alopecia**) or thinning of the hair is usually related to genetic tendencies and endocrine disorders such as diabetes, thyroiditis, and even menopause. Poor nutrition

causes stringy, dull, dry, and thin hair. The oil of sebaceous glands lubricates the hair. Excessively oily hair is associated with androgen hormone stimulation. Dry, brittle hair occurs with aging and with excessive use of chemical agents.

The amount of hair covering the extremities is sometimes reduced as a result of aging. Arterial insufficiency is most common over the lower extremities. In women, do not confuse a loss of hair with shaven legs.

Inspect the scalp for lesions, which are not easy to notice in thick hair. The scalp is normally smooth and inelastic, with even colouration. By carefully separating strands of hair, thoroughly examine the scalp for lesions. Note the characteristics of any scalp lesion. If you find lumps or bruises, ask if the patient has experienced recent head trauma. Moles on the scalp are common. Warn the patient that combing or brushing sometimes causes a mole to bleed. Dandruff or psoriasis frequently causes scaliness or dryness of the scalp.

Careful inspection of hair follicles on the scalp and pubic areas will possibly reveal lice or other parasites. The three types of lice are *Pediculus humanus capitis* (head lice), *Pediculus*

► BOX 31-8 Skin Malignancies

Basal Cell Carcinoma

0.5 to 1.0 cm crusted lesion that is flat or raised and has a rolled, somewhat scaly border.

Frequently there are underlying, widely dilated blood vessels that appear within the lesion.



Basal Cell Carcinoma

Squamous Cell Carcinoma

Occurs more often on mucosal surfaces and nonexposed areas of skin, compared with basal cell.

0.5 to 1.5 cm scaly lesion is sometimes ulcerated or crusted.

Appears frequently and grows more rapidly than basal cell.



Basal Squamous Cell Carcinoma

Melanoma

0.5 to 1.0 cm brown, flat lesion that appears on sun-exposed or nonexposed skin. Variegated pigmentation, irregular borders, and indistinct margins.

Ulceration, recent growth, or recent changes in long-standing mole are ominous signs.



Melanoma

Illustrations from Marks, J., & Miller, J. (Eds.) (2006). *Lookingbill and Mark's principles of dermatology* (4th ed.). Philadelphia, PA: Elsevier; **Basal cell**: p. 65, Fig 5-14A; **Squamous cell**: p. 63, Fig 5-12. **Melanoma**: From Paller, A. S., & Mancini, A. J. (2011). *Hurwitz clinical pediatric dermatology* (4th ed., p. 192, Fig 9.18). Edinburgh: Elsevier/Saunders.

humanus corporis (body lice), and *Pediculus pubis* (crab lice). Head and crab lice attach their eggs to hair. The tiny eggs look like oval particles of dandruff. The lice themselves are difficult to see. Head and body lice are very small with greyish white bodies. Crab lice have red legs. Observe for bites or pustular eruptions in the hair follicles and in areas where skin surfaces meet, such as behind the ears and in the groin. The discovery of lice requires immediate treatment (Box 31-10).

Nails

The condition of the nails reflects general health, state of nutrition, a person's occupation, and level of self-care. Nail biting can reveal a person's psychological state. Before assessing the

nails, gather a brief history (Table 31-11). The most visible portion of the nails is the nail plate, the transparent layer of epithelial cells covering the nail bed (Figure 31-7). The vascularity of the nail bed creates the nail's underlying colour. The semilunar, whitish area at the base of the nail bed is called the lunula, from which the nail plate develops.

Inspection and Palpation. Inspect the nail bed for colour, cleanliness, and length; the thickness and shape of the nail, the texture of the nail; the angle between the nail and the nail bed; and the condition of the lateral and proximal nail folds around the nail. Also palpate the nail base. When inspecting the nails, you will obtain a quick sense about the patient's hygiene practices. The nails are normally transparent, smooth,

✱ BOX 31-9 EVIDENCE-INFORMED PRACTICE GUIDELINE

Skin Cancer Prevention

Research Summary

What is cancer? More specifically, what is skin cancer? Cancer by definition is an “uncontrolled growth and spread of abnormal cells” (CCS Steering Committee, 2010). Therefore, skin cancer is characterized by abnormal skin cells, which can spread and invade other tissues. More importantly, what can we do about skin cancer? As nurses, it becomes our responsibility to assess for and educate our patients about all types of skin cancers, especially for the most serious form called melanoma. There are several risk factors for melanoma: major factors are positive family history of melanoma, a prior melanoma, and multiple or unusual moles. Other factors include fair complexion or skin that is sensitive to the sun; excessive exposure to the sun (especially before age 18), and the use of tanning beds or booths.

Research has indicated that skin cancer, when detected early and treated properly, is highly curable (CCS Steering Committee, 2010). Therefore early assessment and intervention is of utmost importance.

Application to Nursing Practice

Nurses have a responsibility to screen and intervene if it is in their patients’ best interest. Promoting and teaching self-screening of skin, hair, and nails for all patients and their family members is one area where nurses have a large role.

- Instruct patients to conduct a complete monthly self-examination of the skin and scalp, noting moles, blemishes, and birthmarks.
- Perform the examination after a bath or shower, including a head-to-toe check.
- Use a well-lit room and mirrors to examine all skin surfaces. If necessary, have the patient ask a family member or significant other to aid in the investigation.

- Remember the warning signs of skin cancer using the ABCD mnemonic: A is for Asymmetry—look for uneven shape; B is for Border irregularity—look for edges that are blurred, notched, or ragged; C is for Colour—pigmentation is not uniform; blue, black, brown variegated and areas of pink, white, grey, blue, or red are abnormal; and D is for Diameter, greater than the size of a typical pencil eraser.
- Teach your patients to contact their health care provider if a skin lesion or mole starts to bleed or ooze or feels different (swollen, hard, lumpy, itchy, or tender to the touch). Especially instruct older adults, who tend to have delayed wound healing.
- Inform your patients of ways to prevent skin cancer by avoiding overexposure to the sun:
 - Wear wide-brimmed hats and long sleeves.
 - Apply broad-spectrum sunscreens with SPF of 15 or greater to protect against ultraviolet B (UVB) and ultraviolet A (UVA) rays approximately 15 minutes before going into the sun and after swimming or perspiring.
 - Avoid tanning under the direct sun at midday (10 A.M. to 4 P.M.).
 - Do not use indoor sunlamps, tanning parlours, or tanning pills.
- Inform patients who are on medications that make the skin more sensitive to the sun (e.g., oral contraceptives, antibiotics, anti-inflammatories, antihypertensives, immunosuppressives) to take extra precautions when spending time in the sun.
- Inform patients to protect their children from the sun. Severe sunburns in childhood greatly increase melanoma risk later in life (Canadian Cancer Society, 2012b).

These interventions will provide the patient with self-screening measures to detect, prevent, and seek early treatment for skin cancer.



Data from Canadian Cancer Society. (2012). *Prevention*. Retrieved from http://www.cancer.ca/Canada-wide/Prevention.aspx?sc_lang=EN.

TABLE 31-10

Nursing History for Hair and Scalp Assessment

Assessment Category

Rationale

Ask patient if he or she is wearing a wig or hairpiece, and ask him or her to remove it.	Wigs or hairpieces interfere with inspection of hair and scalp. (Patient sometimes requests to omit this part of examination.)
Determine if patient has noted change in growth or loss of hair; change in texture or colour.	Change often occurs slowly over time.
Identify type of hair care products used for grooming.	Excessive use of chemical agents and burning of hair causes drying and brittleness.
Determine if patient has recently had chemotherapy (drugs that cause hair loss) or taken a vasodilator (minoxidil) for hair growth.	Chemotherapeutic agents kill cells that rapidly multiply, such as tumour cells and normal hair cells. Minoxidil causes excessive hair growth.
Has patient noted changes in diet or appetite?	Nutrition influences condition of hair.

well rounded, and convex, with a nail bed angle of about 160 degrees. The surrounding cuticles are smooth, intact, and without inflammation. If the nails are ragged, dirty, and poorly kept, this is a good indication that either the patient practises infrequent nail care or is physically unable to perform care. However, consider the patient’s profession, because some individuals have dirty nails as part of their employment (e.g., mechanics, coal miners, and farmers) despite excellent nail care. Jagged, bitten, or broken nail edges or cuticles predispose a patient to localized infection. Report any abnormalities such as erythema or swelling.

safety alert Patients with impaired circulation are at greater risk for localized infection. It is important to observe the condition of hand and foot nails and nail beds to identify risks for and early signs of infection.

In light-skinned individuals, nail beds are pink with translucent white tips. In dark-skinned patients, nail beds are darkly pigmented with a blue or reddish hue. A brown or black pigmentation is normal with longitudinal streaks (Figure 31-8). Trauma, **cirrhosis**, diabetes mellitus, and hypertension cause splinter hemorrhages. Vitamin, protein, and electrolyte changes cause various lines or bands to form on the nail beds.

Nails normally grow at a constant rate, but direct injury or generalized disease impairs growth. With aging, the nails of the fingers and toes become harder and thicker. Longitudinal

BOX 31-10 PATIENT TEACHING

Hair and Scalp Assessment

Objective

- Patient will perform proper hygiene practices for care of the hair and scalp.

Teaching Strategies

- Instruct patient about basic hygiene practices for care of the hair and scalp (see Chapter 37).
- Instruct patients who have head lice to shampoo thoroughly with pediculicide shampoo (available at drugstores) in cold water, comb thoroughly with a fine-tooth comb (following product directions), and discard comb. Caution against use of products containing lindane, a toxic ingredient known to cause adverse reactions. Repeat shampoo treatment following product directions.
- After combing, remove any detectable nits or nit cases with tweezers or between the fingernails. A dilute solution of vinegar and water helps loosen nits.
- Instruct patients and parents about ways to reduce transmission of lice:
 - Do not share personal care items with others.
 - Vacuum all rugs, car seats, pillows, furniture, and flooring thoroughly, and discard vacuum bag.
 - Seal nonwashable items in plastic bags for 14 days if unable to dry-clean or vacuum.
 - Use thorough hand hygiene practices.
 - Launder all clothing, linen, and bedding in hot soap and water, and dry in a hot dryer for at least 20 minutes. Dry-clean nonwashable items.
 - Do not use insecticide.
 - Instruct patient to notify his or her partner if lice were sexually transmitted.
 - Avoid physical contact with infested individuals and their belongings, especially clothing and bedding.
 - Soak combs, brushes, and hair accessories in lice-killing products for one hour or in boiling water for 10 minutes.

Evaluation

- Have patient describe methods used to care for the hair and scalp.
- Have patient explain the steps to take to reduce lice transmission in the home.

Data from Tebruegge, M., Pantazidou, A., & Curtis, N. (2010). What's bugging you? An update on the treatment of head lice infestation. *Archives of Diseases in Childhood*, 96, 2–8 doi:10.1136/adc.2009.178038; and Canadian Pediatric Society. (2010). *Head lice*. Retrieved from <http://www.caringforkids.cps.ca/whensick/HeadLice.htm>.

striations develop, and the rate of nail growth slows. Nails become more brittle, dull, and opaque and turn yellow in older adults because of insufficient calcium. Also with age, the cuticle becomes less thick and wide.

Inspection of the angle between the nail and nail bed normally reveals an angle of 160 degrees (Box 31-11). A larger angle and softening of the nail bed indicates chronic oxygenation problems. Palpate the nail base to determine firmness and the condition of circulation. The nail base is normally firm.

To palpate, gently grasp the patient's finger and observe the colour of the nail bed. Next, apply gentle, firm, quick pressure with the thumb to the nail bed and release and observe **capillary refill**. As you apply pressure, the nail bed will appear white or blanched; however, the pink colour should return

► TABLE 31-11

Nursing History for Nail Assessment

Assessment Category

Ask if patient has experienced recent trauma or changes in nails (splitting, breaking, discolouration, thickening).

Has the patient had other symptoms of pain, swelling, presence of systemic disease with fever, or psychological or physical stress?

Question patient's nail care practices. Determine if patient has acrylic nails or silk wraps.

Determine if patient has risks for nail or foot problems (e.g., diabetes, peripheral vascular disease, older adulthood, obesity).

Rationale

Trauma changes shape and growth of nail. Systemic conditions cause changes in colour, growth, and shape.

Alterations sometimes occur slowly over time.

Helps to indicate if change in nails is due to local or systemic problem. Acrylic nails and silk wraps are areas for fungal growth.

Chemical agents cause drying of nails. Improper care damages nails and cuticles.

Vascular changes associated with diabetes and peripheral vascular disease reduce blood flow to peripheral tissues; foot lesions and thickened nails are common. Some older adults have trouble performing foot and nail care because of poor vision, incoordination, or inability to bend over. Obese patients have difficulty bending over.

immediately on release of pressure. Capillary refill is measured in seconds; less than two seconds is brisk, while greater than four seconds is sluggish. Failure of the pinkness to return promptly indicates circulatory insufficiency. An ongoing bluish or purplish cast to the nail bed occurs with cyanosis. A white cast or pallor results from anemia.

Calluses and corns are commonly found on the toes or fingers. A callus is flat and painless, resulting from a thickening of the epidermis. Friction and pressure from shoes cause corns, usually over bony prominences. During the examination, instruct the patient in proper nail care (Box 31-12).

Head and Neck

An examination of the head and neck includes assessment of the head, eyes, ears, nose, mouth, pharynx, and neck (lymph nodes, carotid arteries, thyroid gland, and trachea). This assessment is commonly referred to in clinical documentation under EENT (eyes, ears, nose, and throat) and includes all of the associated physical structures (e.g., peripheral arteries and carotid arteries). Assessment of the head and neck uses inspection, palpation, and auscultation, with inspection and palpation often used simultaneously.

Head

Inspection and Palpation. The nursing history screens for intracranial injury and local or congenital deformities

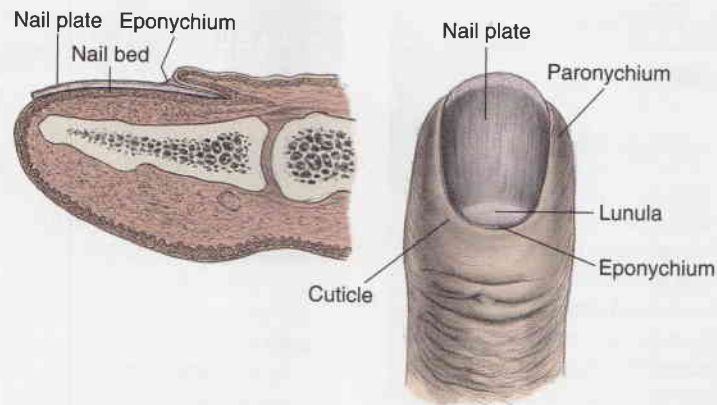


Figure 31-7 Components of the nail unit. Redrawn from Thompson, J. M., et al. (2001). *Mosby's clinical nursing* (5th ed.). St Louis, MO: Mosby.



Figure 31-8 Pigmented bands in nail of patient with dark skin.
Source: From Seidel, H. M., et al. (2011). *Mosby's guide to physical examination* (7th ed., p. 175). St Louis, MO: Mosby.

(Table 31-12). Inspect the patient's head, noting the position, size, shape, and contour. The head is normally held upright and midline to the trunk. Holding the head tilted to one side is perhaps an indication of unilateral hearing or visual loss. A horizontal jerking or bobbing indicates a tremor.

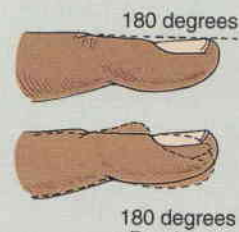
Note the patient's facial features, looking at the eyelids, eyebrows, nasolabial folds, and mouth for shape and symmetry. It is normal for slight asymmetry to exist. If there is facial asymmetry, note if all features on one side of the face are affected or if only a portion of the face is involved. Various neurological disorders (e.g., facial nerve paralysis) affect different nerves that innervate muscles of the face.

Examine the size, shape, and contour of the skull. The skull is generally round with prominences in the frontal area anteriorly and the occipital area posteriorly. Trauma typically causes local skull deformities. In infants, a large head results from congenital anomaly or the buildup of cerebrospinal fluid in the ventricles (**hydrocephalus**). Some adults have enlarged jaws and facial bones resulting from **acromegaly**, a disorder caused by excessive secretion of growth hormone. Palpate the

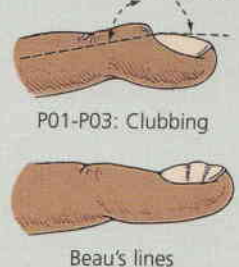
► BOX 31-11 Abnormalities of the Nail Bed



Normal nail: Approximately 160-degree angle between nail plate and nail



Clubbing: Change in angle between nail and nail base (eventually larger than 180 degrees); nail bed softening, with nail flattening; often, enlargement of fingertips
Causes: Chronic lack of oxygen: heart or pulmonary disease



Beau's lines: Transverse depressions in nails indicating temporary disturbance of nail growth (nail grows out over several months)

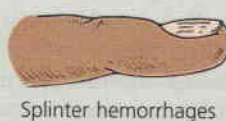
Causes: Systemic illness such as severe infection; nail injury



Koilonychia (spoon nail):

Concave curves

Causes: Iron deficiency anemia, syphilis, use of strong detergents



Splinter hemorrhages: Red or brown linear streaks in nail bed
Causes: Minor trauma, subacute bacterial endocarditis, trichinosis



Paronychia: Inflammation of skin at base of nail

Causes: Local infection, trauma

BOX 31-12 PATIENT TEACHING

Nail Assessment

Objective

- Patient properly cares for fingernails, feet, and toenails.

Teaching Strategies

- Instruct patient to cut nails only after soaking them about 10 minutes in warm water. (Exception: Diabetic patients are warned against soaking nails because this dries the hands and feet out; dry skin leads to infection.)
- Caution patient against over-the-counter preparations to treat corns, calluses, or ingrown toenails.
- Tell the patient to cut nails straight across and even with the tops of the fingers or toes. If patient has diabetes, tell patient to file rather than cut the nails (see Chapter 37).
- Instruct patient to shape nails with a file or emery board.
- If patient is diabetic:
 - Wash feet daily in warm water, and carefully dry them, especially between the toes. Inspect feet each day in good lighting, looking for dry places and cracks in the skin. Soften dry feet by applying a cream or lotion such as Nivea, Eucerin, or Alpha Keri.
 - Do not put lotion between the toes; moisture between the toes allows microorganisms to grow, leading to infections.
 - Caution patient against using sharp objects to poke or dig under the toenail or around the cuticle.
 - Have patient see a podiatrist for treatment of ingrown toenails and nails that are thick or tend to split.

Evaluation

- Inspect nails during subsequent patient interactions.
- Have patient explain steps to take to avoid injury.

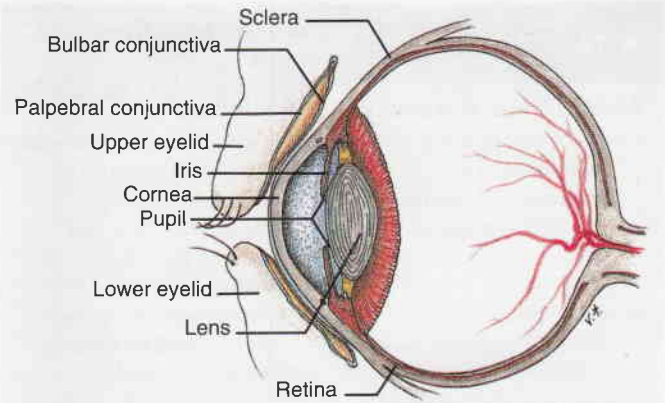


Figure 31-9 Cross-section of the eye.

skull for nodules or masses. Gently rotate the fingertips down the midline of the scalp and then along the sides of the head to identify abnormalities. Then palpate the temporomandibular joint (TMJ) space bilaterally. Place the fingertips just anterior to the tragus of each ear. The fingertips should slip into the joint space as the patient's mouth opens, to gently palpate the joint spaces. Normally, the movements should be smooth, although it is not unusual to hear or feel a clicking or snapping in the TMJ (Seidel et al., 2011).

Eyes

Examination of the eyes includes inspection of external and internal eye structures and extraocular movement and the assessment of visual acuity and visual fields. Figure 31-9 shows a cross-section of the eye. The assessment detects visual alterations and determines the level of assistance that patients require when ambulating or performing self-care activities. Some patients with visual problems also need special aids for reading educational materials or instructions (e.g., medication labels). Table 31-13 reviews the nursing history for an eye examination. Box 31-13 describes common types of visual problems.

External Eye Structures

To inspect external eye structures, stand directly in front of the patient at eye level and ask the patient to look at your face.

Position and Alignment

Assess the position of the eyes in relation to one another. Normally, they are parallel to each other. Bulging eyes (**exophthalmos**) usually indicate hyperthyroidism. The crossing of eyes (**strabismus**) results from neuromuscular injury or inherited abnormalities. Tumours or inflammation of the orbit often cause abnormal eye protrusion.

For the remainder of the eye examination, have the patient remove contact lenses.

Eyebrows. Inspect the eyebrows for size, extension, texture of hair, alignment, and movement. Normally, the eyebrows are symmetrical. Coarseness of hair and failure to extend beyond the temporal canthus possibly reveals hypothyroidism. If the brows are thinned, this is possibly a result of waxing or plucking. Aging causes loss of the lateral third of the eyebrows. Have the patient raise and lower the eyebrows. The brows normally raise and lower symmetrically. An

TABLE 31-12 Nursing History for Head Assessment

Assessment Category	Rationale
Determine if patient experienced recent head trauma. If so, assess state of consciousness after injury (immediately on return and 5 minutes later), duration of unconsciousness, and predisposing factors (e.g., seizure, poor vision, blackout).	Trauma is major cause for lumps, bumps, cuts, bruises, or deformities of scalp or skull. Loss of consciousness following head injury indicates possible brain injury.
Ask if patient has history of headache; note onset, duration, character, pattern, and associated symptoms.	Character of headache helps to reveal causative factors such as sinus infection, migraine, or neurological disorders.
Determine length of time patient has experienced neurological symptoms.	Duration of signs or symptoms reveals severity of problem.
Review patient's occupational history for use of safety helmets.	Nature of some occupations creates a risk for head injury.
Ask if patient participates in contact sports, cycling, inline skating, or skateboarding.	These activities require use of safety helmets.

▶ TABLE 31-13

Nursing History for Eye Assessment

Assessment Category

Rationale

Determine if patient has history of eye disease, (e.g., glaucoma, retinopathy, cataracts), eye trauma, diabetes, hypertension, or eye surgery.

Some diseases or trauma cause risk for partial or complete visual loss. Patient may have had surgery for a visual disorder.

Determine problems that prompted patient to seek health care. Ask patient about eye pain, photophobia (sensitivity to light), burning or itching, excess tearing or crusting, diplopia (double vision) or blurred vision, awareness of a "film" or "curtain" over field of vision, floaters (small, black spots that seem to float across field of vision), flashing lights, or halos around lights.

Common symptoms of eye disease indicate need for health care provider.

Determine whether there is family history of eye disorders or diseases.

Certain eye problems such as glaucoma or retinitis pigmentosa are inherited.

Review patient's occupational history and recreational hobbies; are safety glasses worn?

Performance of close, intricate work causes eye fatigue. Working with computers causes eye strain. Certain occupational tasks (e.g., working with chemicals) and recreational activities (e.g., fencing, motorcycle riding) place people at risk for eye injury unless patients take precautions.

Ask patient if he or she wears glasses or contacts and if so, how often.

Patients need to wear glasses or contacts during certain portions of examination for accurate assessment.

Determine when patient last visited ophthalmologist or optometrist.

Date of last eye examination reveals level of preventive care patient takes.

Assess medications patient is taking, including eye drops or ointment.

Determines need to assess patient's knowledge of medications. Certain medications cause visual symptoms.

▶ BOX 31-13

Common Eye and Visual Problems

Hyperopia

Hyperopia is farsightedness, a refractive error in which rays of light enter the eye and focus behind the retina. Individuals are able to clearly see distant objects but not close objects.

Myopia

Myopia is nearsightedness, a refractive error in which rays of light enter the eye and focus in front of the retina. Individuals are able to clearly see close objects but not distant objects.

Presbyopia

Presbyopia is impaired near vision in middle-aged and older adults, caused by loss of elasticity of the lens and associated with the aging process.

Retinopathy

Retinopathy is a noninflammatory eye disorder resulting from changes in retinal blood vessels. It is a leading cause of blindness.

Strabismus

Strabismus is a (congenital) condition in which both eyes do not focus on an object simultaneously; these eyes appear crossed. Impairment of the extraocular muscles or their nerve supply causes strabismus.

Amblyopia

Amblyopia is a (congenital) condition, commonly referred to as a "lazy eye," and occurs when the nerve pathway in one eye does not develop in early childhood. This weakness to one eye can result in blurred vision, distortion of depth perception, or progressive vision loss to the affected eye. Early screening and referral of children for amblyopia and strabismus is important to correct and preserve vision.

Cataracts

A cataract is an increased opacity of the lens, which blocks light rays from entering the eye. Cataracts sometimes develop slowly and progressively after age 35 or suddenly after trauma. Cataracts are one of the most common eye disorders. Most older adults (65 year old and up) have some evidence of visual impairment from cataracts. Protection of the eyes from the sun's rays and trauma through the use of sunglasses and protective eye wear when there is an occupational or recreational risk for eye injury is an important factor in the prevention of cataracts.

Glaucoma

Glaucoma is intraocular structural damage resulting from elevated intraocular pressure. Obstruction of the outflow of aqueous humor causes this. Without treatment, the disorder will lead to blindness.

Macular Degeneration

Macular degeneration is blurred central vision often occurring suddenly, caused by a progressive degeneration of the centre of the retina. It is the most common visual impairment of individuals over age 50 and the most common cause of blindness in older adults. There is no cure.

inability to move the eyebrows indicates a facial nerve paralysis (cranial nerve VII).

Eyelids. Inspect the eyelids for position, colour, condition of the surface, condition and direction of the eyelashes, and the patient's ability to open, close, and blink. When the eyes are open in a normal position, the lids do not cover the pupil and you cannot see the sclera above the iris. The lids are also close to the eyeball. An abnormal drooping of the lid over the pupil is called **ptosis** (pronounced "toe-sis"), caused by edema or impairment of the third cranial nerve. In the older adult,

ptosis results from a loss of elasticity that accompanies aging. Observe for defects in the position of the lid margins. An older adult frequently has lid margins that turn out (**ectropion**) or in (**entropion**). An entropion sometimes leads to the lashes of the lid irritating the conjunctiva and cornea, increasing the risk of infection. The eyelashes are normally distributed evenly and curved outward away from the eye. An erythematous or yellow lump (hordeolum or sty) on the follicle of an eyelash indicates an acute suppurative inflammation.

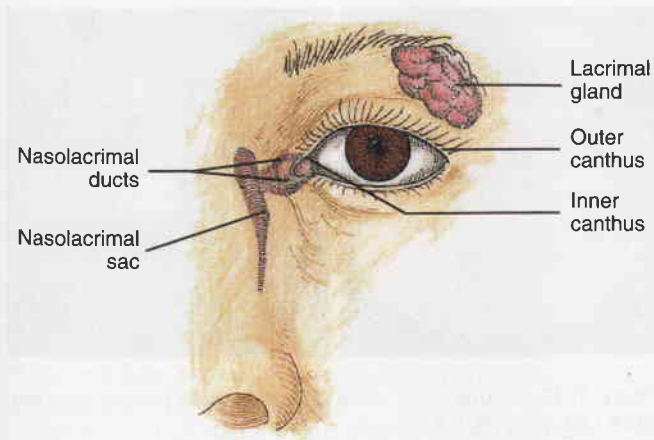


Figure 31-10 The lacrimal apparatus secretes and drains tears, which moisten and lubricate eye structures.

To inspect the surface of the upper lids, ask the patient to close his or her eyes. Then raise both eyebrows gently with the thumb and index finger to stretch the skin. The lids are normally smooth and the same colour as the skin. Redness indicates inflammation or infection. Lid edema is sometimes due to allergies or to heart or kidney failure. Edema of the eyelids prevents them from closing. Inspect lesions for typical characteristics and discomfort or drainage. Wear clean gloves if drainage is present.

The lids normally close symmetrically. Failure of the lids to close exposes the cornea to drying. This condition is common in unconscious patients or in those with facial nerve paralysis. Ask the patient to open the eyes for inspection of the lower lids. You assess the same characteristics noted for the upper lids. Normally a patient blinks involuntarily and bilaterally up to 20 times a minute. The blink reflex lubricates the cornea. Report absent or infrequent, rapid, or monocular (one-eyed) blinking.

Lacrimal Apparatus. The lacrimal gland (Figure 31-10), located in the upper outer wall of the anterior part of the orbit, is responsible for tear production. Tears flow from the gland across the eye's surface to the lacrimal duct, which is in the nasal corner or inner canthus of the eye. The lacrimal gland is sometimes the site of tumours or infections. Inspect this area for edema and redness. Palpate the gland gently to detect tenderness. Normally you cannot feel the gland.

The nasolacrimal duct sometimes becomes obstructed, blocking the flow of tears. Observe for evidence of edema in the inner canthus. Gentle palpation of the duct at the lower eyelid just inside the lower orbital rim causes a regurgitation of tears.

Conjunctivae and Sclerae. The bulbar conjunctiva covers the exposed surface of the eyeball up to the outer edge of the cornea. Observe the sclera under the bulbar conjunctiva; it normally has the colour of white porcelain in whites and light yellow in dark-skinned patients. Sclerae become pigmented and appear either yellow or green if liver disease is present.

Take care when inspecting the conjunctivae. For adequate exposure of the bulbar conjunctiva, retract the eyelids without placing pressure directly on the eyeball. Gently retract both lids, with the thumb and index finger pressed against the lower and upper bony orbits. Ask the patient to look up, down, and from side to side. Many patients begin to blink, making

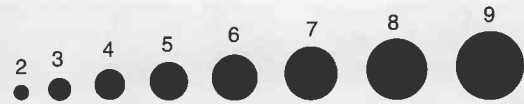


Figure 31-11 Chart depicting pupillary size in millimetres.

the examination difficult. Inspect for colour, texture, and the presence of edema or lesions. Normally the conjunctivae are free of erythema. The presence of redness indicates an allergic or infectious **conjunctivitis**. Bright red blood in a localized area surrounded by normal-appearing conjunctiva usually indicates subconjunctival hemorrhage. Conjunctivitis is a highly contagious infection. It is easy to spread the crusty drainage that collects on eyelid margins from one eye to the other. Wear clean gloves during the examination. Performing proper hand hygiene is necessary before and after the examination.

Corneas. The cornea is the transparent, colourless portion of the eye covering the pupil and iris. From a side view, it looks like the crystal of a wristwatch. While the patient looks straight ahead, inspect the cornea for clarity and texture while shining a penlight obliquely across the cornea's entire surface. The cornea is normally shiny, transparent, and smooth. In older adults, the cornea loses its lustre. Any irregularity in the surface indicates an abrasion or tear that requires further examination by a health care provider. Both conditions are very painful. Note the colour and details of the underlying iris. In an older adult, the iris becomes faded. A thin white ring along the margin of the iris, called an **arcus senilis**, is common with aging but is abnormal in anyone under age 40. To test for the corneal blink reflex, see the cranial nerve test section of this chapter.

Pupils and Irises. Observe the pupils for size, shape, equality, accommodation, and reaction to light. The pupils are normally black, round, regular, and equal in size (3 to 7 mm in diameter) (Figure 31-11). The iris should be clearly visible.

Cloudy pupils indicate cataracts. Dilated pupils result from glaucoma, trauma, neurological disorders, eye medications (e.g., atropine), or withdrawal from opioids. Inflammation of the iris or use of drugs (e.g., pilocarpine, morphine, or cocaine) causes constricted pupils. Pinpoint pupils are a common sign of opioid intoxication. Shining a beam of light through the pupil and onto the retina stimulates the third cranial nerve and causes the muscles of the iris to constrict. Any abnormality along the nerve pathways from the retina to the iris alters the ability of the pupils to react to light. Changes in intracranial pressure, lesions along the nerve pathways, locally applied ophthalmic medications, and direct trauma to the eye alter pupillary reaction.

Test pupillary reflexes (to light and accommodation) in a dimly lit room. While the patient looks straight ahead, bring a penlight from the side of the patient's face, directing the light onto the pupil (Figure 31-12). If the patient looks at the light, there will be a false reaction to accommodation. A directly illuminated pupil constricts, and the opposite pupil constricts consensually. Observe the quickness and equality of the reflex. Repeat the examination for the opposite eye.

To test for accommodation, ask the patient to gaze at a distant object (the far wall) and then at a test object (finger or pencil) held approximately 10 cm from the bridge of the patient's nose. The pupils normally converge and accommodate by constricting when looking at close objects. The pupillary responses are equal. Testing for accommodation is

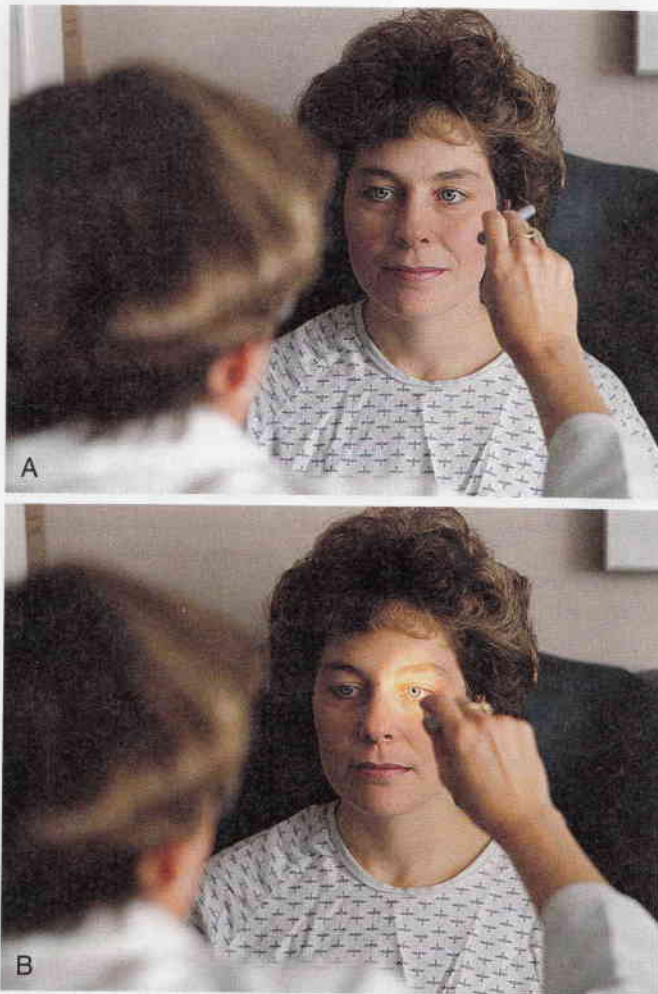


Figure 31-12 A, To check pupillary reflexes, the nurse first holds the penlight to the side of the patient's face. B, Illumination of the pupil causes pupillary constriction.

important only if the patient has a defect in the pupillary response to light (Jarvis et al., 2009). If assessment of pupillary reaction is normal in all tests, record the abbreviation **PERRLA** (pupils equal, round, reactive to light, and accommodation).

Internal Eye Structures. The examination of the internal eye structures through the use of an ophthalmoscope is beyond the scope of new graduate nurses' practice. Advanced nurse practitioners use the **ophthalmoscope** to inspect the fundus (Figure 31-13), which includes the retina, choroid, optic nerve disc, macula, fovea centralis, and retinal vessels. Patients in greatest need of an examination are those with diabetes, hypertension, and intracranial disorders.

Extraocular Movements. Six small muscles guide the movement of each eye. Both eyes move parallel to each other in each of the six directions of gaze (Figure 31-14). To assess extraocular movements, have the patient sit or stand 60 cm away, facing you. Hold a finger at a comfortable distance (15 to 30 cm) from the patient's eyes. Have the patient maintain his or her head in a fixed position facing forward and follow the movement of the finger with the eyes only. Have the patient look to the right, to the left, and diagonally up and down to the left and right. The finger moves smoothly and slowly within the normal field of vision.

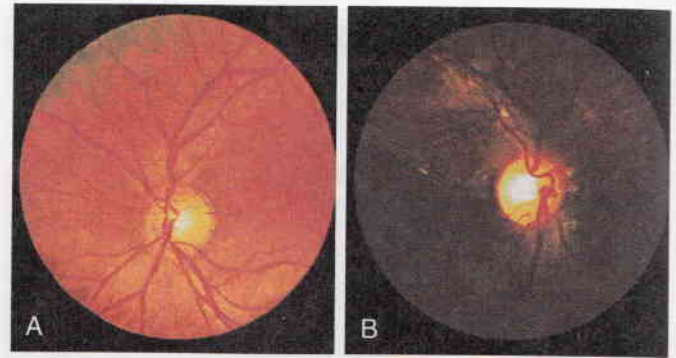


Figure 31-13 Fundus of, A, white patient. B, Black patient. Courtesy MEDCOM, Cypress, CA.

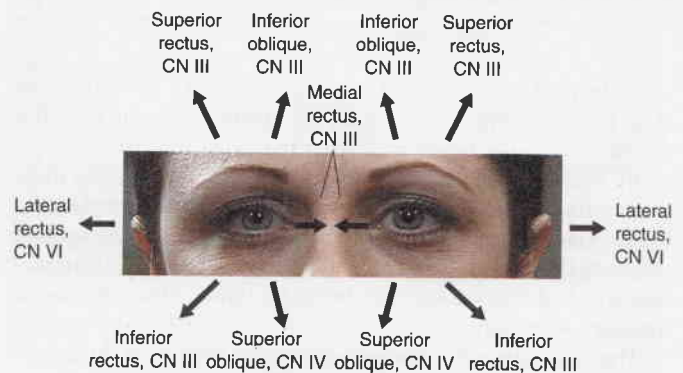


Figure 31-14 Six directions of gaze. Direct the patient to follow finger movement through each gaze. **Source:** From Seidel H. M., et al. (2011). *Mosby's guide to physical examination*, (7th ed., p. 278). St Louis, MO: Mosby.

As the patient gazes in each direction, observe for parallel eye movement, the position of the upper eyelid in relation to the iris, and the presence of abnormal movements. As the eyes move through each direction of gaze, the upper eyelid covers the iris only slightly. You assess **nystagmus**, an involuntary, rhythmical oscillation of the eyes, by periodically stopping movement of the finger. You initiate nystagmus in patients with normal eye movements by having them gaze to the far left or right. Disturbances in eye movement reflect local injury to eye muscles and supporting structures or a disorder of the cranial nerves innervating the muscles.

Visual Fields. As a person looks straight ahead, he or she is normally able to see all objects in the periphery. To assess visual fields, have the patient stand or sit 60 cm away, facing you at eye level. The patient gently closes or covers one eye (e.g., the left) and looks at your eye directly opposite. Close the opposite eye (in this case the right) so that the field of vision is superimposed on that of the patient. Move a finger equidistant from you and the patient outside the field of vision, then slowly bring it back into the visual field. Ask the patient to tell when he or she is able to see the finger. If you see the finger before the patient does, a portion of the patient's visual field is reduced. To test temporal field vision, the object should be slightly behind the patient. (Note: The nurse can see the finger.) Repeat the procedure for each field of vision for the other eye.

safety alert Some patients with visual field problems are at risk for injury because they cannot see all the objects in front of them. Older adults commonly have loss of peripheral vision caused by changes in the lens.

Visual Acuity. The assessment of visual acuity, the ability to see small details, tests central vision. The easiest way to assess near vision is to ask patients to read printed material under adequate lighting. If patients wear glasses, make sure they wear them during assessment. Determine the language the patient speaks and reading ability. Asking patients to read aloud will help determine literacy. If the patient has difficulty reading, move to the next step.

Assessment of distant vision requires using a Snellen chart (paper chart or projection screen). The chart is well lighted. Test vision without corrective lenses first. Have the patient sit or stand 6.1 m (20 feet) away from the chart and try to read all the letters beginning at any line with both eyes open. Then have the patient read the line with each eye separately (patient covers the opposite eye with an index card or eye cover). The patient avoids applying pressure to the eye. Note the smallest line in which the patient is able to read all the letters correctly, and record the visual acuity for that line. Repeat the test with the patient wearing corrective lenses. Complete the test rapidly enough so that the patient does not memorize the chart (Jarvis et al., 2009).

If a patient is unable to read, use an *E* chart or one with pictures of familiar objects. Instead of reading letters, patients tell which direction each *E* is pointing or the name of the object. Record the visual acuity score for each eye and for both eyes.

The Snellen chart has standardized numbers at the end of each line of the chart. The numerator is the number 20, or the distance the patient stands from the chart. The denominator is the distance from which the normal eye is able to read the chart. Normal vision is 20/20. The larger the denominator, the poorer the patient's visual acuity. For example, a value of 20/40 means that the patient, standing 6.1 m (20 feet) away, can read a line that a person with normal vision can read from 40 feet away. Record visual acuity as O.D. (right eye) and O.S. (left eye) as well as *sc* (without correction) or *cc* (with correction), depending on whether the patient wears glasses or contact lenses.

If patients cannot read even the largest letters or figures of a Snellen chart, test their ability to count upraised fingers or distinguish light. Hold a hand 30 cm from the patient's face, and have the patient count the upraised fingers. To check light perception, shine a penlight into the eye and then turn the light off. If the patient notes when the light is turned on or off, light perception is intact.

You assess near vision by asking the patient to read a hand-held card containing a vision screening chart. Instruct the patient to hold the card a comfortable distance (5 to 6 cm) from the eyes and read the smallest line possible. This portion of the examination is a good time to discuss the need for routine eye examinations (see Box 31-14).

Ears

The ear assessment determines the integrity of ear structures and hearing acuity (Box 31-15). The three parts of the ear are the external, middle, and inner ear (Figure 31-15). Inspect and palpate external ear structures, inspect middle ear structures with an otoscope, and test the inner ear by measuring the

BOX 31-14 PATIENT TEACHING

Eye Assessment

Objectives

- Patient follows recommendations for regular eye examinations.
- Patient recognizes warning signs and symptoms of eye disease.
- Patient takes appropriate safety precautions for visual deficits.

Teaching Strategies

- Tell patient that people under age 40 need to have a complete eye examination every three to five years (or more often if family histories reveal risks such as diabetes or hypertension).
- Tell patient that people over age 40 need to have eye examinations every two years to screen for conditions that may develop without awareness (e.g., glaucoma).
- Tell patient that people with diabetes or over age 65 should have yearly eye examinations.
- Describe the typical symptoms of eye disease (see Box 31-13).
- Instruct older adult to take the following precautions because of normal visual changes: avoid or use caution while driving at night, increase lighting in the home to reduce risk of falls, and paint the first and last steps of a staircase and the edge of each step in between a bright colour to aid depth perception.

Evaluation

- Ask patient or family member to report on patient's most recent visit to an ophthalmologist.
- Have patient describe when to have an eye examination.
- Ask patient to describe common symptoms of eye disease.
- Observe the home environment of a patient with visual deficits.

Reference: Agency for Healthcare Research and Quality. (2005). *Guide to clinical preventive services* (AHRQ Publication No. 05-0570). Rockville, MD: Author. Retrieved from <http://www.ahrp.gov/clinic/pocketgd.htm>.



patient's hearing acuity. External ear structures consist of the auricle, outer ear canal, and tympanic membrane (eardrum). The ear canal is normally curved and approximately 2.5 cm long in an adult. It is lined with skin containing fine hairs, nerve endings, and glands secreting **cerumen**. The middle ear is an air-filled cavity containing the three bony ossicles (malleus, incus, and stapes). The eustachian tube connects the middle ear to the nasopharynx. Pressure between the outer atmosphere and the middle ear is stabilized through the eustachian tube.

The inner ear contains the cochlea, vestibule, and semicircular canals. Assessing the ears determines the integrity of ear structures and the condition of hearing. Nursing history data (Table 31-14) aid in identifying risks for hearing disorders.

Understanding the mechanisms for sound transmission helps identify the nature of hearing disorders. Sound travels through the ear by air and bone conduction; the following explains the steps of hearing:

1. Sound waves in the air enter the external ear, passing through the outer ear canal.
2. The sound waves reach the tympanic membrane, causing it to vibrate.
3. Vibrations are transmitted through the middle ear by the bony ossicular chain to the oval window at the opening of the inner ear.
4. The cochlea receives the sound vibration.

BOX 31-15 PATIENT TEACHING

Ear Assessment

Objectives

- Patient uses proper technique for cleansing the ears.
- Patient follows preventive guidelines for screening of hearing loss.
- Patient with hearing loss communicates effectively.

Teaching Strategies

- Instruct patient in the proper way to clean the outer ear (see Chapter 37), avoiding use of cotton-tipped applicators and sharp objects such as hairpins, which cause impaction of cerumen deep in the ear canal or cause trauma.
- Tell patient to avoid inserting pointed objects into the ear canal.
- Encourage patients over age 65 to have regular hearing checks. Explain that a reduction in hearing is a normal part of aging (see Chapter 47).
- Instruct family members of patients with hearing losses to avoid shouting and instead speak in low tones, and to be sure the patient is able to see the speaker's face.

Evaluation

- Ask patient to explain the proper technique for cleansing the ears.
- In a follow-up visit, question patient about frequency of hearing checks.
- Observe patient with hearing loss interacting with family members.

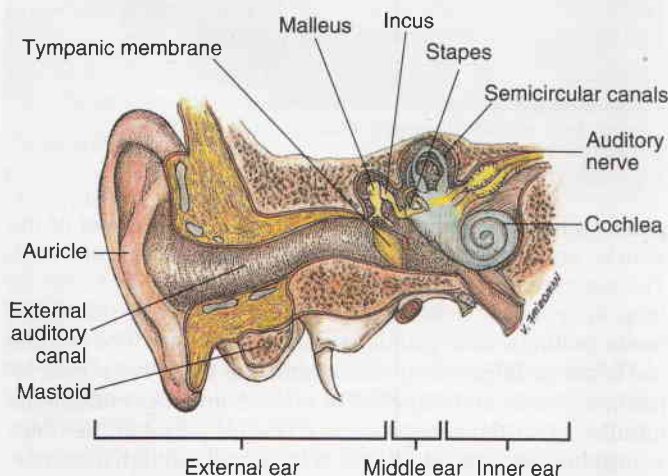


Figure 31-15 Structures of the external, middle, and inner ear.

5. Nerve impulses from the cochlea travel to the auditory (eighth cranial) nerve and to the cerebral cortex.

Disorders of the ear result from several types of problems, including mechanical dysfunction (blockage by earwax or foreign body), trauma (foreign bodies or noise exposure), neurological disorders (auditory nerve damage), acute illnesses (viral infection), and toxic effects of medications.

Auricles. With the patient sitting comfortably, inspect the auricle's size, shape, symmetry, landmarks, position, and colour (Figure 31-16). The auricles are normally of equal size and level with each other. The upper point of attachment is in a straight line with the lateral canthus, or corner of the eye. The position of the auricle is almost vertical. Ears that are low

TABLE 31-14 Nursing History for Ear Assessment

Assessment Category

Rationale

Assess if patient has experienced ear pain, itching, discharge, vertigo, tinnitus (ringing in ears), or change in hearing.	These signs and symptoms indicate infection or hearing loss.
Assess risks for hearing problem.	Risk factors predispose patient to permanent hearing loss.
<i>Infants/children:</i> Hypoxia at birth, meningitis, birth weight less than 1500 g, family history of hearing loss, congenital anomalies of skull or face, nonbacterial intrauterine infections (rubella, herpes), maternal drug use, excessively high bilirubin, head trauma	It is difficult to assess infant's hearing status with examination only.
<i>Adults:</i> Exposure to industrial or recreational noise, genetic disease (Meniere disease), neurodegenerative disorder	
Determine patient's exposure to loud noises at work and availability of protective devices.	Prolonged noise exposure causes temporary or permanent hearing loss.
Note behaviours indicative of hearing loss, such as failure to respond when spoken to, requests to repeat comments, leaning forward to hear, and child's inattentiveness or use of monotonous voice tone.	Individuals with hearing loss cope with sensory deficit through a variety of behavioural cues.
Assess if patient takes large doses of aspirin or other ototoxic drugs (e.g., aminoglycosides, furosemide, streptomycin).	Medications have side effects of hearing loss.
Determine whether patient uses hearing aid.	Determination allows nurse to assess ability to care for device and allows nurse to adjust voice tone to communicate.
If patient had recent hearing problem, note onset, contributing factors, affected ear, and effect on activities of daily living.	Helps determine nature and severity of hearing problem.
Determine whether patient has repeated history of cerumen buildup in ear.	Cerumen impaction is common cause for conduction deafness.

set or at an unusual angle are a sign of chromosome abnormality (e.g., Down syndrome) or may indicate the possibility of fetal alcohol affects/syndrome. Ear colour is usually the same as that of the face, without moles, cysts, deformities, or nodules. Redness is a sign of inflammation or fever. Extreme pallor indicates frostbite. Deformities of the ear can be a sign that there may be other organ abnormalities that occurred during fetal development (e.g., kidney).

Palpate the auricles for texture, tenderness, and skin lesions. Auricles are normally smooth and without lesions. If the patient complains of pain, gently pull the auricle, press on the tragus, and palpate behind the ear over the mastoid process. If palpating the external ear increases the pain, an external

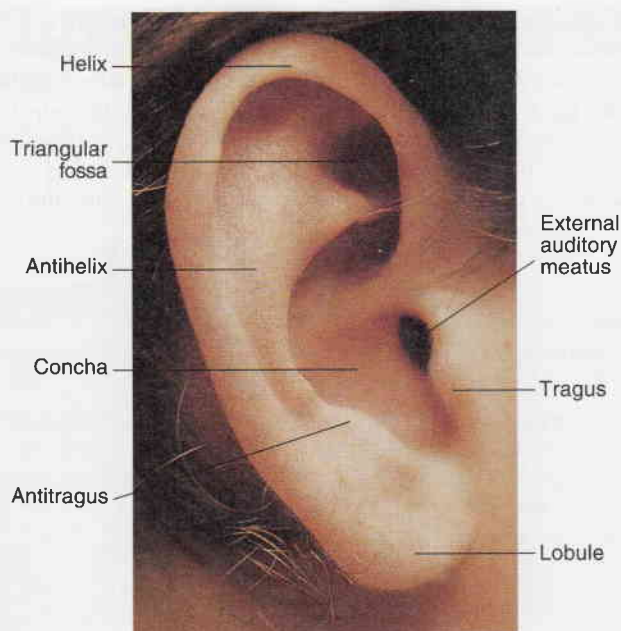


Figure 31-16 Anatomical structures of the auricle. **Source:** From Seidel, H. M., et al. (2011). *Mosby's guide to physical examination* (7th ed., p. 298). St Louis, MO: Mosby.

ear infection is likely. If palpation of the auricle and tragus does not influence the pain, the patient possibly has a middle ear infection. Tenderness in the mastoid area indicates mastoiditis.

Inspect the opening of the ear canal for size and presence of discharge. If discharge is present, wear clean gloves during the examination. A swollen or occluded meatus is not normal. A yellow, waxy substance called cerumen is common. Yellow or green, foul-smelling discharge indicates infection or a foreign body.

Ear Canals and Eardrums. Deeper structures of the external and middle ear are assessed with the use of an **otoscope**. The examination of the internal ear structures through the use of an otoscope is beyond the scope of new graduate nurses' practice. Advanced nurse practitioners use the otoscope to inspect the ear canal, tympanic membrane, and bony landmarks. Patients in greatest need of an examination are those with a possible foreign body in the ear canal, pain, swelling, or injury near the ear or patients with disorders related to balance. A detailed presentation of an otoscope examination of the inner ear can be found in Jarvis et al., (2009), *Physical Examination and Health Assessment*, First Canadian Edition.

Hearing Acuity. A patient with a hearing loss often fails to respond to conversation. The three types of hearing loss are conduction, sensorineural, and mixed. A conduction loss interrupts sound waves as they travel from the outer ear to the cochlea of the inner ear because the sound waves are not transmitted through the outer and middle ear structures. Examples of causes of a conduction loss are swelling of the auditory canal or tears in the tympanic membrane. A sensorineural loss involves the inner ear, auditory nerve, or hearing centre of the brain. Sound is conducted through the outer and middle ear structures, but the continued transmission of sound becomes interrupted at some point beyond the bony ossicles. A mixed loss involves a combination of conduction and sensorineural loss.

safety alert Patients working or living around loud noises are at risk for hearing loss. In addition, adolescents are at risk for premature hearing loss from continued exposure to loud music in their car or home or at concert events. The use of iPods and MP3 players also increases the risk for hearing loss in all patients.

Older adults experience an inability to hear high-frequency sounds and consonants (e.g., S, Z, T, and G). Deterioration of the cochlea and thickening of the tympanic membrane cause older adults to gradually lose hearing acuity. They are especially at risk for hearing loss due to **ototoxicity** (injury to auditory nerve) resulting from high-maintenance doses of antibiotics (e.g., aminoglycosides).

To conduct a hearing assessment, have the patient remove any hearing aid if worn. Note the patient's response to questions. Normally, the patient responds without excessive requests to have the questions repeated. If you suspect hearing loss, check the patient's response to the whispered voice. Test one ear at a time while the patient occludes the other ear with a finger. Ask the patient to gently move the finger up and down during the test. While standing 30 to 60 cm from the testing ear, cover the mouth so that the patient is unable to read lips. After exhaling fully, whisper softly toward the unoccluded ear, reciting random numbers with equally accented syllables, such as *nine-four-ten*. If necessary, gradually increase voice intensity until the patient correctly repeats the numbers. Then test the other ear for comparison. Seidel et al. (2011) report that patients normally hear numbers clearly when whispered, responding correctly at least 50% of the time.

If a hearing loss is present, there are tests that you perform using a tuning fork or audiometry. A tuning fork of 256 to 512 hertz (Hz) is most commonly used. The tuning fork allows for comparison of hearing by bone conduction with that of air conduction. Hold the base of the tuning fork with one hand without touching the tines. Tap the fork lightly against the palm of the other hand to set the fork in vibration (Table 31-15).

Nose and Sinuses

Assess the integrity of the nose and sinuses by using inspection and palpation. The patient sits during the examination. A penlight allows for gross examination of each naris. A more detailed examination requires use of a nasal speculum to inspect the deeper nasal turbinates. Do not use a speculum unless a qualified practitioner is present. Table 31-16 lists components of the nursing history.

Nose. When inspecting the external nose, observe for shape, size, skin, colour, and the presence of deformity or inflammation. The nose is normally smooth and symmetric with the same colour as the face. Recent trauma sometimes causes edema and discolouration. If swelling or deformities exist, gently palpate the ridge and soft tissue of the nose by placing one finger on each side of the nasal arch and gently moving the fingers from the nasal bridge to the tip. Note any tenderness, masses, or underlying deviations. Nasal structures are usually firm and stable.

Air normally passes freely through the nose when a person breathes. To assess patency of the nares, place a finger on the side of the patient's nose and occlude one naris. Ask the patient to breathe with the mouth closed. Repeat the procedure for the other naris.

While illuminating the anterior nares, inspect the mucosa for colour, lesions, discharge, swelling, and evidence of

bleeding. If discharge is present, apply gloves. Normal mucosa is pink and moist without lesions. Pale mucosa with clear discharge indicates allergy. A mucoid discharge indicates rhinitis. A sinus infection results in yellowish or greenish discharge. Habitual use of intranasal cocaine and opioids causes puffiness and increased vascularity of the nasal mucosa. For the patient with a nasogastric tube, routinely check for local

skin breakdown (**excoriation**) of the naris, characterized by redness and skin sloughing.

To view the septum and turbinates, have the patient tip the head back slightly to provide a clear view. Illuminate the septum and observe for alignment, perforation, or bleeding. Normally the septum is close to the midline, and thicker anteriorly than posteriorly. The turbinates are covered with mucous

► **TABLE 31-15** Tuning Fork Tests

Tests and Steps

Weber Test (Lateralization of Sound)

Hold fork at its base and tap it lightly against heel of palm.

Place base of vibrating fork on midline vertex of patient's head or middle of forehead (see illustration below).



Ask patient if he or she hears the sound equally in both ears or better in one ear.

Rinne Test (Comparison of Air and Bone Conduction)

Place stem of vibrating tuning fork against patient's mastoid process (see illustration below).



Begin counting the interval with your watch.

Rationale

Patient with normal hearing hears sound equally in both ears. In conduction deafness, sound is heard best in impaired ear. In unilateral sensorineural hearing loss, sound is identified only in normal ear.

Patient should hear air-conducted sound twice as long as bone-conducted sound (2:1 ratio). For example, if patient hears bone-conducted sound for 10 seconds, he or she should hear air-conducted sound for an additional 10 seconds. In conduction deafness, patient can no longer hear bone-conducted sound. In sensorineural loss, sound is reduced and heard longer through air but less than 2:1 ratio.

► TABLE 31-15 Tuning Fork Tests—cont'd

Tests and Steps

Ask patient to tell you when he or she no longer hears the sound; note number of seconds. Quickly place still-vibrating tines 1 to 2 cm from ear canal, and ask patient to tell you when he or she no longer hears the sound (see illustration below).



Continue counting time the sound is heard by air conduction. Compare number of seconds the sound is heard by bone conduction versus air conduction.

Rationale

Illustrations from Seidel, H. M., Ball, J. W., Dains, J. E., Flynn, J. A., Solomon, B. S., & Stewart, R.W. (2011). *Mosby's guide to physical examination* (7th ed., p. 311). St Louis, MO: Mosby.

► TABLE 31-16 Nursing History for Nose and Sinus Assessment

Assessment Category

Ask if patient has had trauma to nose.

Ask if patient has history of allergies, nasal discharge, epistaxis (nosebleeds), or postnasal drip.

If there is history of nasal discharge, assess colour, amount, odour, duration, and associated symptoms (e.g., sneezing, nasal congestion, obstruction, or mouth breathing).

Assess for history of nosebleed, including site, frequency, amount of bleeding, treatment, and difficulty stopping bleeding.

Ask if patient uses nasal spray or drops, including amount, frequency, and duration of use.

Ask if patient snores at night or has difficulty breathing.

Rationale

Trauma causes septal deviation and asymmetry of external nose.

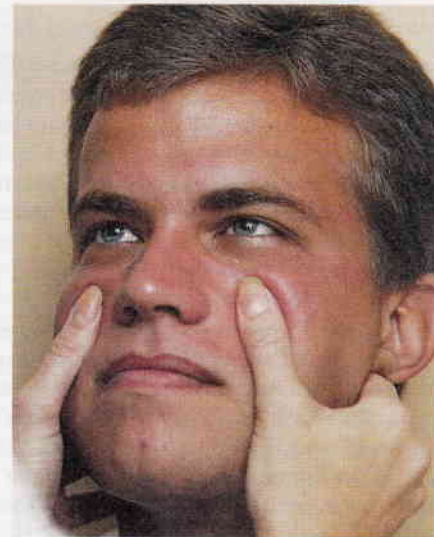
History is useful in determining source or nature of nasal and sinus drainage.

Aids in ruling out presence of infection, allergy, or drug use.

Characteristics sometimes reveal trauma, medication use, or excessive dryness as causative factors.

Overuse of over-the-counter nasal preparations causes physical change in mucosa.

Difficulty with breathing or snoring indicates septal deviation or obstruction.

**Figure 31-17** Palpation of maxillary sinuses.

membranes that warm and moisten inspired air. Normal mucosa is pink and moist, without lesions. A deviated septum obstructs breathing and interferes with passage of a nasogastric tube. Perforation of the septum often occurs after repeated use of intranasal cocaine. Note any **polyps** (tumourlike growths) or purulent drainage.

Sinuses. Examination of the sinuses involves palpation. In cases of allergies or infection, the interior of the sinuses become inflamed and swollen. The most effective way to assess for tenderness is by externally palpating the frontal and maxillary facial areas (Figure 31-17). Palpate the frontal sinus

BOX 31-16 PATIENT TEACHING

Nose and Sinus Assessment

Objectives

- Patient will safely use over-the-counter nasal sprays.
- Parents will take proper measures to stop a child's nosebleed.
- Older adult will take safety precautions with loss of olfaction.

Teaching Strategies

- Caution patient against overuse of over-the-counter nasal sprays, which leads to "rebound" effect, causing excess nasal congestion.
- Instruct parents in care of a child with nosebleeds: have child sit up and lean forward to avoid aspiration of blood, apply pressure to the anterior nose with the thumb and forefinger as the child breathes through the mouth, and apply ice or a cold cloth to the bridge of the nose if pressure fails to stop bleeding.
- Instruct older adults to install smoke detectors on each floor of their home.
- Instruct older adults to always check dated labels on food to ensure against spoilage.

Evaluation

- Have patient explain proper use of over-the-counter nasal sprays.
- Have parents demonstrate and describe technique for stopping a nosebleed.
- Inspect patient's home during visit, and look for smoke detectors. Ask to check some food items in the refrigerator.



by exerting pressure with the thumb up and under the patient's eyebrow. Gentle, upward pressure elicits tenderness easily if sinus irritation is present. Do not apply pressure to the eyes. If tenderness of sinuses is present, the sinuses may be transilluminated. This procedure, however, requires advanced experience. Box 31-16 describes teaching guidelines during nose and sinus assessment.

Mouth and Pharynx

Assess the mouth and pharynx to detect signs of overall health, determine oral hygiene needs, and develop therapies for patients with dehydration, restricted intake, oral trauma, or oral airway obstruction. To assess the oral cavity, use a penlight and tongue depressor or a single gauze square. Wear clean gloves during the examination. Have the patient sit or lie down during the examination. Assess the oral cavity also while administering oral hygiene (see Chapter 37). Table 31-17 describes the nursing history for assessment of the mouth and pharynx.

Lips. Inspect the lips for colour, texture, hydration, contour, and lesions. With the patient's mouth closed, view the lips from end to end. Normally they are pink, moist, symmetrical, and smooth (Figure 31-18). Lip colour in the dark-skinned patient varies from pink to plum. Have female patients (especially older adults) remove their lipstick before the examination. Anemia causes pallor of the lips, with cyanosis caused by respiratory or cardiovascular problems. Cherry-coloured lips indicate carbon monoxide poisoning. Any lesions such as nodules or ulcerations are related to infection, irritation, or skin cancer.

Buccal Mucosa, Gums, and Teeth. Ask the patient to clench the teeth and smile to observe teeth occlusion. The

TABLE 31-17

Nursing History for Mouth and Pharyngeal Assessment

Assessment Category

Determine if patient wears dentures or retainers and if they are comfortable.

Determine if patient has had recent change in appetite or weight.

Determine if patient uses tobacco products:

Smoking of cigarette, cigar, or pipe

Smokeless tobacco: use of chewing tobacco and snuff

Review history for alcohol consumption.

Assess dental hygiene practices, including use of fluoride toothpaste, frequency of brushing and flossing, and frequency of dental visits.

Ask if patient has pain from chewing or eating. If so, ask if mouth lesions are present, including duration and associated symptoms.

Rationale

Patient needs to remove dentures to visualize and palpate gums.

Ill-fitting dentures chronically irritate mucosa and gums.

Symptoms result from painful mouth conditions or poor hygiene.

Smoking of these products increases risk for lung, oral cavity, larynx, and esophageal cancers (Canadian Cancer Society Steering Committee [CCS], 2010).

Smokeless tobacco causes various cancers and noncancerous oral disorders. Long-term snuff users have increased risk for cancer of the gums and cheeks (CCS, 2010).

Excessive alcohol consumption appears to have greater risk for oral cavity and pharynx cancer. Effects of alcohol are independent of tobacco use.

Assessment reveals patient's need for education and/or financial support. Periodontal disease has a higher prevalence in older adults who have history of high plaque buildup, use tobacco, and visit the dentist infrequently.

Pain is often associated with broken tooth, tooth grinding, or temporomandibular joint problems. Extra care is needed during oral hygiene administration.

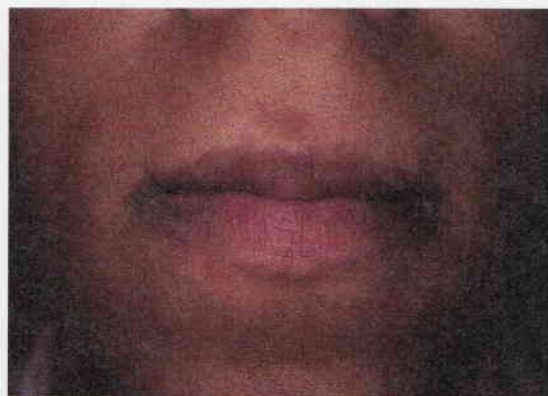


Figure 31-18 The lips are normally pink, symmetrical, smooth, and moist.

BOX 31-17 PATIENT TEACHING

Mouth and Pharyngeal Assessment

Objectives

- Patient will practise proper oral hygiene measures and dental care.
- Patient will describe warning signs of oral cancer.
- Older adult will maintain normal solid food intake.

Teaching Strategies

- Discuss proper techniques for oral hygiene, including brushing and flossing (see Chapter 37).
- Explain the early warning signs of oral cavity and pharynx cancer, including a sore that bleeds easily and does not heal, a lump or thickening, and a red or white patch on the mucosa that persists. Difficulty chewing, swallowing, or moving the tongue or jaw are late symptoms (Canadian Cancer Society, 2012c).
- Encourage regular dental examination every six months for children, adults, and older adults.
- Identify older patients who have difficulty in chewing and changes in the teeth. Teach patients to eat soft foods and cut food into small pieces.

Evaluation

- Ask patient to demonstrate brushing.
- Have patient identify when to have regular dental checkups.
- Have patient identify the warning signs of oral cavity and pharynx cancer.
- Ask older adult to keep a diet record for three days.



Figure 31-19 Inspection of inner oral mucosa of the lower lip.



Figure 31-20 Retraction of the buccal mucosa allows for clear visualization.

upper molars normally rest directly on the lower molars, and the upper incisors slightly override the lower incisors. A symmetrical smile reveals normal facial nerve function.

Inspect the teeth to determine the quality of dental hygiene (Box 31-17). Note the position and alignment of the teeth. To examine the posterior surface of the teeth, have the patient open the mouth with the lips relaxed. Use a tongue depressor to retract the lips and cheeks, especially when viewing the molars. Note the colour of teeth and presence of dental **caries** (cavities), tartar, and extraction sites. Normal, healthy teeth are smooth, white, and shiny. A chalky white discolouration of the enamel is an early indication of caries formation. Brown or black discolourations indicate the formation of caries. A stained yellow colour is from tobacco use, whereas coffee, tea, and colas cause a brown stain. In the older adult, loose or missing teeth are common because bone resorption increases. An older adult's teeth often feel rough when tooth enamel calcifies. Yellow or darkened teeth are also common in the older adult because of the general wear and tear that exposes the darker, underlying dentin.

To view the mucosa and gums, ask the patient to first remove any dental appliance. View the inner oral mucosa by having the patient open and relax the mouth slightly and then gently retract the patient's lower lip away from the teeth (Figure 31-19). Repeat this process for the upper lip. Inspect the mucosa for colour, hydration, texture, and lesions such as ulcers, abrasions, or cysts. Normally the mucosa is a glistening pink, smooth, and moist. Some common small, yellow-white raised lesions on the buccal mucosa and lips are Fordyce spots, or ectopic sebaceous glands (Seidel et al., 2011). If lesions are present, palpate them gently with a gloved hand for tenderness, size, and consistency.

To inspect the buccal mucosa, ask the patient to open the mouth and then gently retract the cheeks with a tongue depressor or gloved finger covered with gauze (Figure 31-20). View the surface of the mucosa from right to left and top to bottom. A penlight illuminates the most posterior portion of the mucosa. Normal mucosa is glistening, pink, soft, moist, and smooth. Varying shades of hyperpigmentation are normal in 10% of light-skinned patients after age 50 and up to 90% of dark-skinned patients by the same age. For patients with normal pigmentation, the buccal mucosa is a good site to inspect for jaundice and pallor. In older adults, the mucosa is normally dry because of reduced salivation. Thick white patches (**leukoplakia**) are often a precancerous lesion seen in heavy smokers and alcoholics. Palpate for any buccal lesions by placing the index finger within the buccal cavity and the thumb on the outer surface of the cheek.

safety alert Patients who smoke cigarettes, cigars, or pipes and those who use smokeless tobacco have an increased risk of oral, laryngeal, and esophageal cancer. These individuals have leukoplakia or other lesions anywhere in their oral cavity (e.g., lips, gums, tongue) at an early age.

Inspect the gums (gingivae) for colour, edema, retraction, bleeding, and lesions while retracting the cheeks. Healthy gums are pink, smooth, and moist and tightly fit around each tooth. Dark-skinned patients often have patchy pigmentation. In older adults, the gums are usually pale. Using clean gloves,

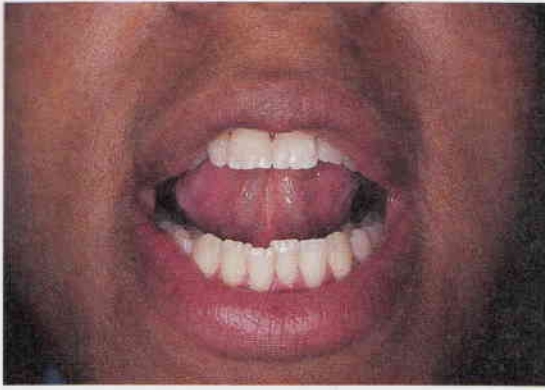


Figure 31-21 The undersurface of the tongue is highly vascular.



Figure 31-22 The hard palate is located anteriorly in the roof of the mouth.

palpate the gums to assess for lesions, thickening, or masses. Normally there is no tenderness. Spongy gums that bleed easily indicate periodontal disease and vitamin C deficiency. If the patient has loose or mobile teeth, swollen gums, or pockets containing debris at the tooth margins, suspect periodontal disease or gingivitis.

Tongue and Floor of Mouth. Carefully inspect the tongue on all sides, as well as the floor of the mouth. Have the patient relax the mouth and stick the tongue out halfway. Note any deviation, tremor, or limitation in movement. This tests hypoglossal nerve function. If the patient protrudes the tongue too far, this will elicit the gag reflex. When the tongue protrudes, it lies midline. To test for tongue mobility, ask the patient to raise the tongue up and move it from side to side. The tongue should move freely.

Using a penlight for illumination, examine the tongue for colour, size, position, texture, and coatings or lesions. A normal tongue is medium or dull red in colour, moist, slightly rough on the top surface, and smooth along the lateral margins. The undersurface of the tongue and the floor of the mouth are highly vascular (Figure 31-21). Take extra care to inspect this area, a common site for oral cancer lesions. The patient lifts the tongue by placing its tip on the palate behind the upper incisors. Inspect for colour, swelling, and lesions such as nodules or cysts. The ventral surface of the tongue is pink and smooth, with large veins between the frenulum folds. To palpate the tongue, explain the procedure and ask the patient to protrude the tongue. Grasp the tip with a gauze square and gently pull it to one side. With a gloved hand, palpate the full length of the tongue and the base for any areas of hardening or ulceration. **Varicosities** (swollen, tortuous veins) are common in the older adult and rarely cause problems.

Palate. Have the patient extend the head backward, holding the mouth open to inspect the hard and soft palates. The hard palate, or roof of the mouth, is located anteriorly. The whitish hard palate is dome shaped. The soft palate extends posteriorly toward the pharynx. It is normally light pink and smooth. Observe the palates for colour, shape, texture, and extra bony prominences or defects (Figure 31-22). A bony growth, or **exostosis**, between the two palates is common.

Pharynx. Perform an examination of pharyngeal structures to rule out infection, inflammation, or lesions. Have the patient tip the head back slightly, open the mouth wide, and say “Ah” while you place the tip of a tongue depressor on the middle third of the tongue. Take care not to press the lower lip

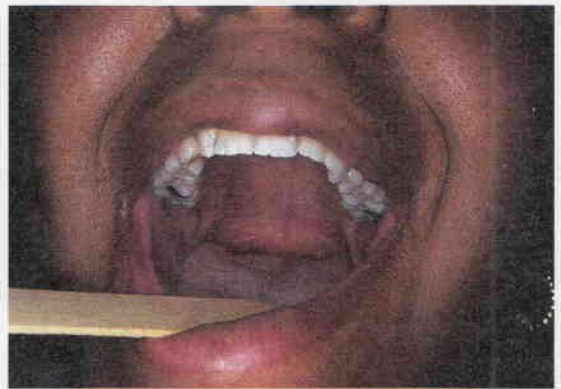


Figure 31-23 A penlight and tongue depressor allow the visualization of the uvula and posterior soft palate.

against the teeth. By placing the tongue depressor too far anteriorly, the posterior part of the tongue mounds up, obstructing the view. Placing the tongue depressor on the posterior tongue elicits the gag reflex.

With a penlight, first inspect the uvula and soft palate (Figure 31-23). Both structures, which are innervated by the tenth cranial (vagus) nerve, should rise centrally as the patient says “Ah.” Examine the anterior and posterior pillars, soft palate, and uvula. View the tonsils in the cavities between the anterior and posterior pillars and note the presence or absence of tissue. The posterior pharynx is behind the pillars. Normally, pharyngeal tissues are pink and smooth and well hydrated. Small irregular spots of lymphatic tissue and small blood vessels are normal. Note edema, petechiae (small hemorrhages), lesions, or exudate. Patients with chronic sinus problems frequently exhibit a clear exudate that drains along the wall of the posterior pharynx. Yellow or green exudate indicates infection. A patient with a typical sore throat has a red and edematous uvula and tonsillar pillars with possible presence of yellow exudate.

Neck

Assessment of the neck includes assessing the neck muscles, lymph nodes of the head and neck, carotid arteries, jugular veins, thyroid gland, and trachea (Figure 31-24). The examination of the jugular veins and carotid arteries is included under

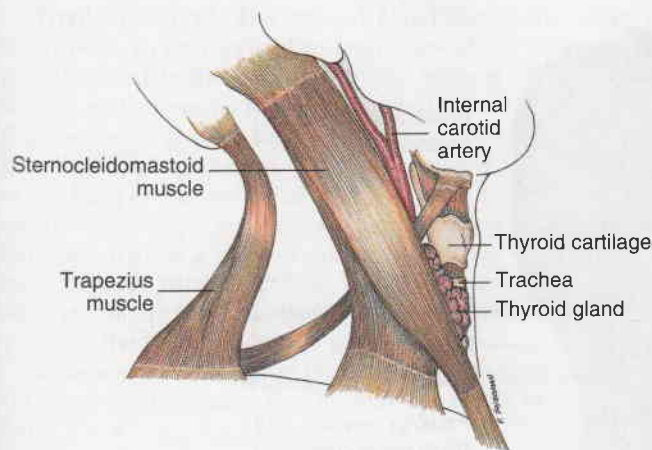


Figure 31-24 Anatomical position of the major neck structures. Note the triangles formed by the sternocleidomastoid muscle, lower jaw, and anterior neck anteriorly and by the sternocleidomastoid muscle, trapezius muscle, and lower neck posteriorly.

the vascular system assessment. Inspect and palpate the neck to determine the integrity of the neck structures and to examine the lymphatic system. Examine the lymphatic system region by region during the assessment of body systems (head and neck, breast, genitalia, and extremities). An abnormality of superficial lymph nodes sometimes reveals the presence of an infection or malignancy. Examination of the thyroid gland and trachea also aids in ruling out malignancies. Perform this examination with the patient sitting. The sternocleidomastoid and trapezius muscles outline the areas of the neck, dividing each side of the neck into two triangles. The anterior triangle contains the trachea, thyroid gland, carotid artery, and anterior cervical lymph nodes. The posterior triangle contains the posterior lymph nodes. Table 31-18 reviews the nursing history for the head and neck examination.

Neck Muscles. First inspect the neck in the usual anatomical position, with slight hyperextension. Observe for symmetry of the neck muscles. Ask the patient to flex the neck with the chin to the chest, hyperextend the neck backward, and move the head laterally to each side and then sideways with the ear moving toward the shoulder. This tests the sternocleidomastoid and trapezius muscles. The neck normally moves without discomfort. Tests that assess muscle strength and function can be performed during assessment of the head and neck, although the description of these tests is included in the assessment of the musculoskeletal system.

Lymph Nodes. An extensive system of lymph nodes collects lymph from the head, ears, nose, cheeks, and lips (Figure 31-25). The immune system protects the body from foreign antigens, removes damaged cells from the circulation, and provides a partial barrier to growth of malignant cells within the body. Assessing the lymph nodes requires competence when caring for patients with suspected immunoincompetence, which is often linked to allergies, human immunodeficiency virus (HIV) infection, autoimmune disease (e.g., lupus erythematosus), or serious infection.

With the patient's chin raised and head tilted slightly, first inspect the area where lymph nodes are distributed and compare both sides. This position stretches the skin slightly over any possible enlarged nodes. Inspect visible nodes for

► **TABLE 31-18**

Nursing History for Neck Assessment

Assessment Category

Assess for history of recent cold or infection or enlarged lymph nodes, exposure to radiation or toxic chemicals.

If there is an enlarged lymph node, consider reviewing history of intravenous drug use, hemophilia, sexual contact with people infected with human immunodeficiency virus (HIV), history of blood transfusion, multiple and indiscriminate sexual contacts, or male with homosexual or bisexual activities.

Ask if patient has had history of neck pain with restriction in movement.

Ask if patient has had change in temperature preference (more or less clothing); swelling in neck; change in texture of hair, skin, or nails; or change in emotional stability.

Ask if patient has history of hypothyroidism or hyperthyroidism or takes thyroid medication or has a family history of thyroid disease.

Review medical history of pneumothorax (collapsed lung) or bronchial tumour.

Rationale

Colds or infections (e.g., mononucleosis) cause temporary or permanent lymph node enlargement. Lymph nodes are also enlarged in various diseases such as cancer. These are risk factors for HIV infection.

Indicates muscle strain, head injury, local nerve injury, or enlarged or swollen lymph node.

Symptoms indicative of thyroid disease.

Disease or medications influence tissue growth of gland.

Conditions place patient at risk for tracheal displacement or lateral deviation.

edema, erythema, or red streaks. Nodes are not normally visible.

Use a methodical approach to palpate the lymph nodes to avoid overlooking any single node or chain. The patient relaxes with the neck flexed slightly forward. Inspect and palpate both sides of the neck for comparison. During palpation, either face or stand to the side of the patient for easy access to all nodes. Using the pads of the middle three fingers of each hand, gently palpate in a rotary motion over the nodes (Figure 31-26). Check each node methodically in the following sequence: occipital nodes at the base of the skull, postauricular nodes over the mastoid, preauricular nodes just in front of the ear, retropharyngeal nodes at the angle of the mandible, submandibular nodes, and submental nodes in the midline behind the mandibular tip. Try to detect enlargement and note the location, size, shape, surface characteristics, consistency, mobility, tenderness, and warmth of the nodes. If the skin is mobile, move the skin over the area of the nodes. It is important to press

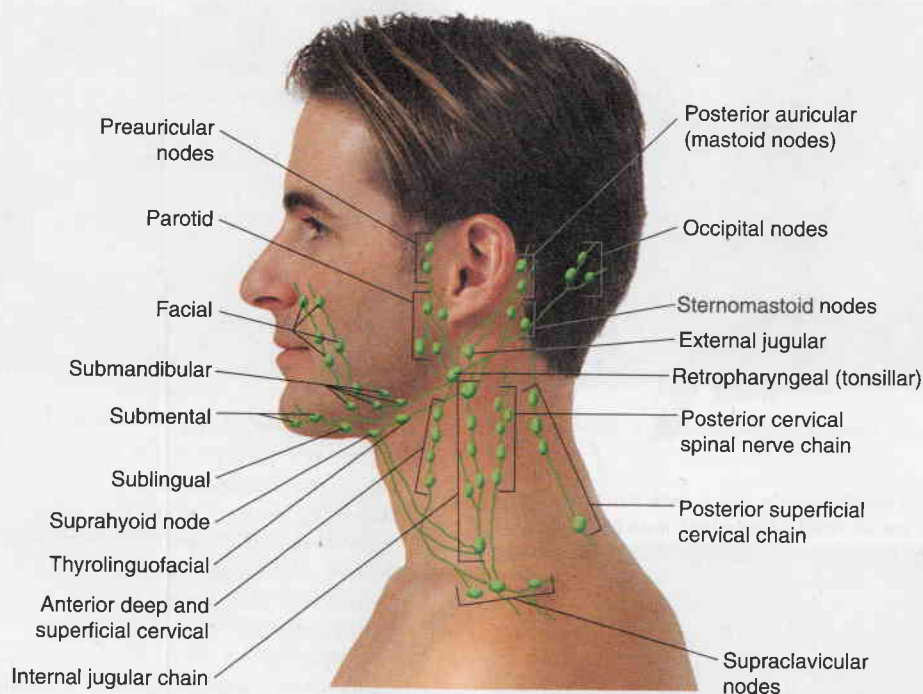


Figure 31-25 Palpable lymph nodes in the head and neck. **Source:** From Seidel, H. M., et al. (2011). *Mosby's guide to physical examination* (7th ed., p. 241). St Louis, MO: Mosby.



Figure 31-26 Supraclavicular lymph node palpation.

underlying tissue in each area and not simply move the fingers over the skin. However, if you apply excessive pressure, you will miss small nodes and destroy palpable nodes.

To palpate supraclavicular nodes, ask the patient to bend the head forward and relax the shoulders. Palpate these nodes by hooking the index and third finger over the clavicle, lateral to the sternocleidomastoid muscle. Palpate the deep cervical

* BOX 31-18 PATIENT TEACHING

Neck Assessment

Objective

- Patient takes proper preventive action if he or she notices a mass in the neck.

Teaching Strategies

- Stress importance of regular compliance with medication schedule to patients with thyroid disease.
- Instruct patient about the lymph nodes and how infection commonly causes node tenderness.
- Instruct patient to call a health care provider when he or she notices an enlarged lump or mass in the neck.
- Teach patient risk factors for HIV infection and other sexually transmitted diseases.

Evaluation

- Have patient explain when to notify a physician about a neck mass.

HIV, Human immunodeficiency virus.

nodes only with the fingers hooked around the sternocleidomastoid muscle.

Normally lymph nodes are not easily palpable. However, small, mobile, nontender nodes are common. Lymph nodes that are large, fixed, inflamed, or tender indicate a problem such as local infection, systemic disease, or neoplasm (Jarvis et al., 2009) (Box 31-18). When you find enlarged nodes, explore the adjacent areas and regions drained by the nodes. Tenderness almost always indicates inflammation. A problem involving a lymph node of the head and neck means an abnormality in the mouth, throat, abdomen, breasts, thorax, or arms. These are the areas drained by the head and neck nodes.

Thyroid Gland. The thyroid gland lies in the anterior lower neck, in front of and to both sides of the trachea. The gland is fixed to the trachea with the isthmus overlying the trachea and connecting the two irregular, cone-shaped lobes (Figure 31-27). Inspect the lower neck overlying the thyroid gland for obvious masses, symmetry, and any subtle fullness at the base of the neck. Ask the patient to hyperextend the neck, which helps tighten the skin for better visualization. Offer the patient a glass of water, and, while observing the neck, have the patient swallow. This manoeuvre helps to visualize an abnormally enlarged thyroid. Normally you cannot visualize the thyroid.

More experienced nurses examine the thyroid by palpating for more subtle masses; this technique will not be discussed here.

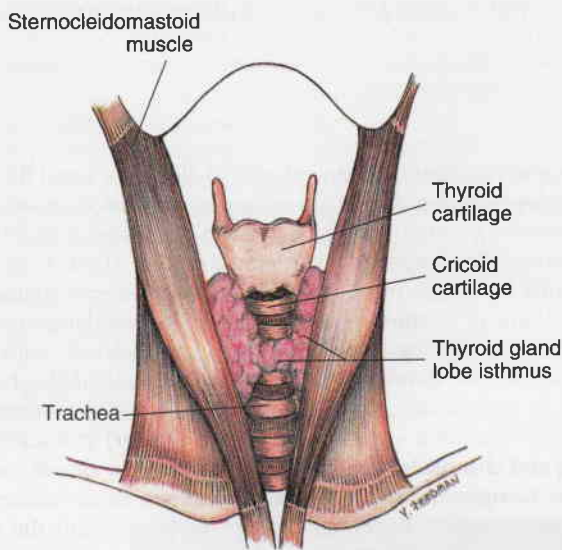


Figure 31-27 Anatomical position of the thyroid gland.

Carotid Artery and Jugular Vein. This portion of the examination is described under examination of the vascular system (see later section).

Trachea. The trachea is a part of the upper respiratory system that you directly palpate. It is normally located in the midline above the suprasternal notch. Masses in the neck or mediastinum and pulmonary abnormalities cause displacement laterally. Have the patient sit or lie down during palpation. Determine the position of the trachea by palpating at the suprasternal notch, slipping the thumb and index fingers to each side. Note if the finger and thumb shift laterally. Do not apply forceful pressure because this elicits coughing.

Thorax and Lungs

Accurate physical assessment of the thorax and lungs requires review of the ventilatory and respiratory functions of the lungs. If disease is affecting the lungs, this will affect other body systems as well. For example, reduced oxygenation causes changes in mental alertness because of the brain's sensitivity to lowered oxygen levels. You will use data from all body systems to determine the nature of pulmonary alterations.

Before assessing the thorax and lungs, be familiar with the landmarks of the chest (Figure 31-28). These landmarks help you identify findings and use assessment skills correctly. The patient's nipples, angle of Louis, suprasternal notch, costal angle, clavicles, and vertebrae are key landmarks that provide a series of imaginary lines for sign identification. Keep a mental image of the location of the lobes of the lung and the position of each rib (Figure 31-29). The proper orientation to anatomical structures ensures a thorough assessment of the anterior, lateral, and posterior thorax.

Locating the position of each rib is critical to visualizing the lobe of the lung being assessed. To begin, locate the angle of Louis at the manubriosternal junction. The angle is a visible and palpable angulation of the sternum and is the point at which the second rib articulates with the sternum. Count the

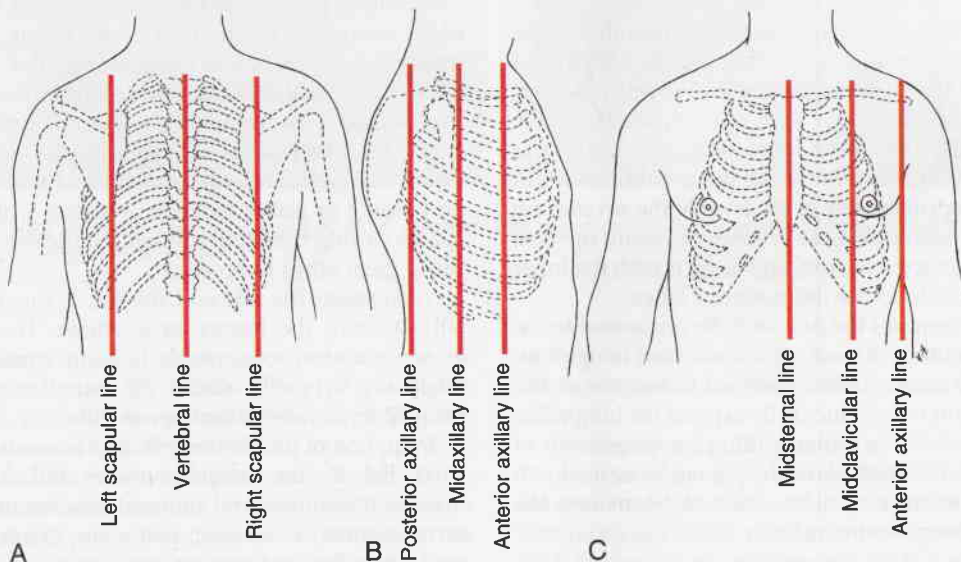


Figure 31-28 Anatomical chest wall landmarks. A, Posterior chest landmarks. B, Lateral chest landmarks. C, Anterior chest landmarks.

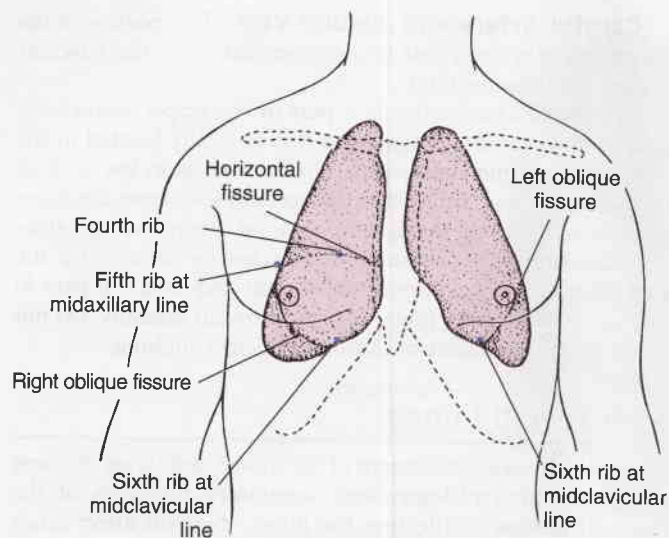


Figure 31-29 Anterior position of lung lobes in relation to anatomical landmarks.

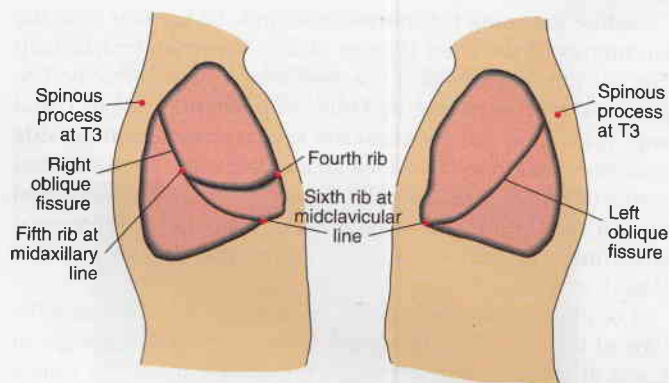


Figure 31-30 Lateral position of lung lobes in relation to anatomical landmarks.

ribs and intercostal spaces (between the ribs) from this point. The number of each intercostal space corresponds with that of the rib just above it. The spinous process of the third thoracic vertebra and the fourth, fifth, and sixth ribs helps to locate the lung's lobes laterally. The lower lobes project laterally and anteriorly (Figure 31-30). Posteriorly, the tip or inferior margin of the scapula lies approximately at the level of the seventh rib (Figure 31-31). After identifying the seventh rib, count upward to locate the third thoracic vertebra, and align it with the inner borders of the scapula to locate the posterior lobes.

The examination requires the patient to be undressed to the waist, with good lighting. Assess patients at risk for pulmonary problems, such as the patient confined to bed rest or the patient with chest pain who cannot fully expand the lungs. The examination begins with the patient sitting for assessment of the posterior and lateral chest. Have the patient sit or lie down for assessment of the anterior chest. Table 31-19 reviews the nursing history for lung examination.

Posterior Thorax

Begin examination of the posterior thorax by observing for any signs or symptoms in other body systems that indicate

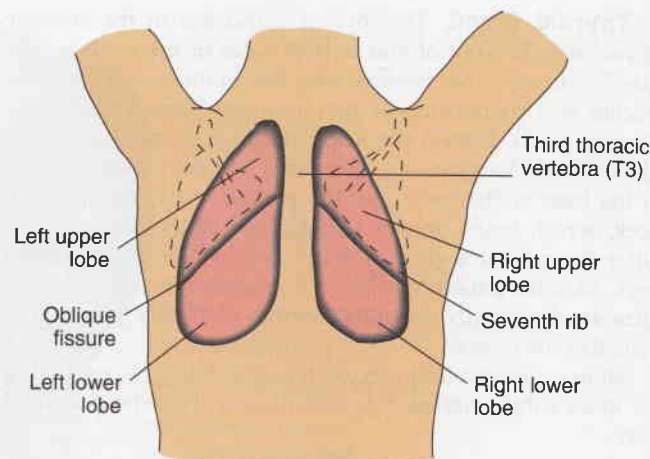


Figure 31-31 Posterior position of lung lobes in relation to anatomical landmarks.

pulmonary problems. Reduced mental alertness, nasal flaring, somnolence, and cyanosis are examples of signs assessed that indicate oxygenation problems. Inspect the posterior thorax by observing the shape and symmetry of the chest from the patient's back and front. Note the anteroposterior diameter. Body shape or posture significantly impairs ventilatory movement. Normally the chest contour is symmetrical, with the anteroposterior diameter one-third to one-half of the transverse, or side-to-side, diameter. A barrel-shaped chest (anteroposterior diameter equals transverse diameter) characterizes aging and chronic lung disease. Infants have an almost round shape. Congenital and postural alterations cause abnormal contours. Some patients lean over a table or splint the side of the chest because of a breathing problem. Splinting or holding the chest wall because of pain causes a patient to bend toward the side affected. Such a posture impairs ventilatory movement.

Standing at a midline position behind the patient, look for deformities, position of the spine, slope of the ribs, retraction of the intercostal spaces during inspiration, and bulging of the intercostal spaces during expiration. The scapulae are normally symmetrical and closely attached to the thoracic wall. The normal spine is straight without lateral deviation. Posteriorly, the ribs tend to slope across and down. The ribs and intercostal spaces are easier to see in a thin person. Normally, no bulging or active movement occurs within the intercostal spaces during breathing. Bulging indicates that the patient is using great effort to breathe.

Also assess the rate and rhythm of breathing (see Chapter 30). Observe the thorax as a whole. The thorax normally expands and relaxes regularly with equality of movement bilaterally. In healthy adults, the normal respiratory rates vary from 12 to 20 respirations per minute.

Palpation of the posterior thorax assesses further characteristics. Palpate the thoracic muscles and skeleton for lumps, masses, pulsations, and unusual movement. If you note pain or tenderness, avoid deep palpation. Fractured rib fragments could be displaced against vital organs. Normally the chest wall is not tender. If you find a suspicious mass or swollen area, lightly palpate it for size, shape, and the typical qualities of a lesion.

► TABLE 31-19 Nursing History for Lung Assessment

Assessment Category

Assess history of tobacco or marijuana use, including type of tobacco, duration and amount (pack-years = number of years smoked × number of packs per day), age started, and efforts to quit and length of time since smoking stopped.

Ask if patient has had a *persistent cough* (productive or nonproductive), *sputum streaked with blood*, *voice change*, *chest pain*, shortness of breath, **orthopnea**, dyspnea during exertion or at rest, poor activity tolerance, or *recurrent attacks of pneumonia or bronchitis*.

Determine if patient works or lives in an environment containing pollutants (e.g., asbestos, arsenic, coal dust) or requiring exposure to radiation. Does patient have exposure to second-hand smoke?

Review history for known or suspected human immunodeficiency virus (HIV) infection, substance abuse, low income, or being a resident or employee of nursing home or shelter, homeless, recent prison inmate, family member of tuberculosis (TB) patient, or immigrant to Canada from a country where TB is prevalent (Canadian Public Health Association, 2005).

Ask if patient has history of persistent cough, hemoptysis, unexplained weight loss, fatigue, night sweats, or fever.

Does patient have history of chronic hoarseness?

Assess history of allergies to pollens, dust, or other airborne irritants and to foods, drugs, or chemical substances.

Review family history for cancer, tuberculosis, allergies, or chronic obstructive pulmonary disease.

Ask if patient has had a pneumonia or influenza vaccine and a TB test; if not, educate patient on need to do so.

Rationale

Smoking is a risk factor for lung cancer, heart disease, cerebrovascular disease, emphysema, or chronic bronchitis. Smoking accounts for a significant percentage of all cancer deaths.

Symptoms of cardiopulmonary alterations help localize objective physical findings. (Warning signals for lung cancer are in *italic type*.)

These risk factors increase chance for various lung diseases.

These are risk factors for HIV.

These are risk factors for both tuberculosis and HIV infection.

Hoarseness indicates laryngeal disorder or abuse of cocaine or opioids (sniffing).

Symptoms such as choking feeling, bronchospasm with respiratory stridor, wheezes on auscultation, and dyspnea are often caused by allergic response. Conditions place patient at risk for lung disease.

The very young, the very old, and those with chronic respiratory problems or with immunosuppressive diseases are at increased risk for respiratory disease.

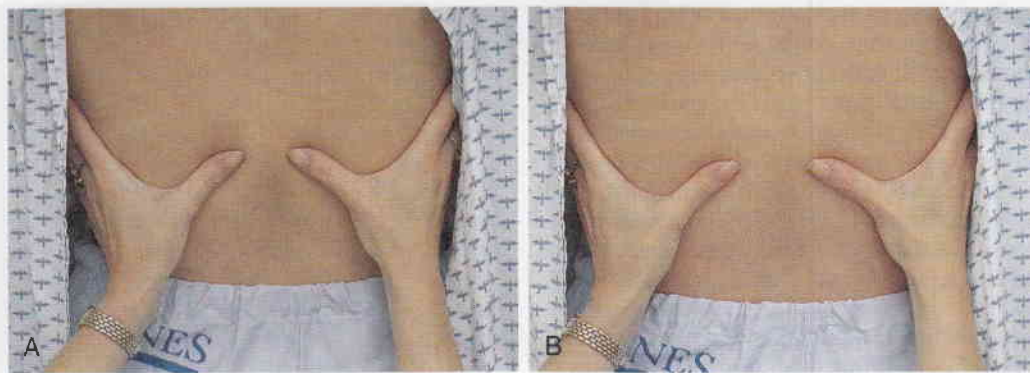


Figure 31-32 A, Hand position for palpation of posterior thorax excursion. B, As patient inhales, movement of chest excursion separates the thumbs.

To measure chest excursion or depth of breathing, stand behind the patient and place the thumbs along the spinal processes at the tenth rib, with the palms lightly contacting the posterolateral surfaces. Place thumbs 5 cm apart, pointing toward the spine and fingers pointing laterally (Figure 31-32, A). Press the hands toward the spine so that a small skin fold appears between the thumbs. Do not slide the hands over the skin. Instruct the patient to take a deep breath after exhaling. Note movement of the thumbs (Figure 31-32, B). Chest excursion is symmetrical, separating the thumbs 3 to 5 cm. Reduced chest excursions may be caused by pain, postural deformity,

or fatigue. In older adults, chest movement normally declines because of costal cartilage calcification and respiratory muscle atrophy.

During speech, the sound created by the vocal cords is transmitted through the lung to the chest wall. The sound waves create vibrations that you palpate externally. These vibrations are called **vocal fremitus** or **tactile fremitus**. Accumulation of mucus, collapse of lung tissue, or presence of lung lesions blocks the vibrations from reaching the chest wall.

To palpate for tactile fremitus, place the palmar surfaces of the fingers or the ulnar part of the hand over symmetrical

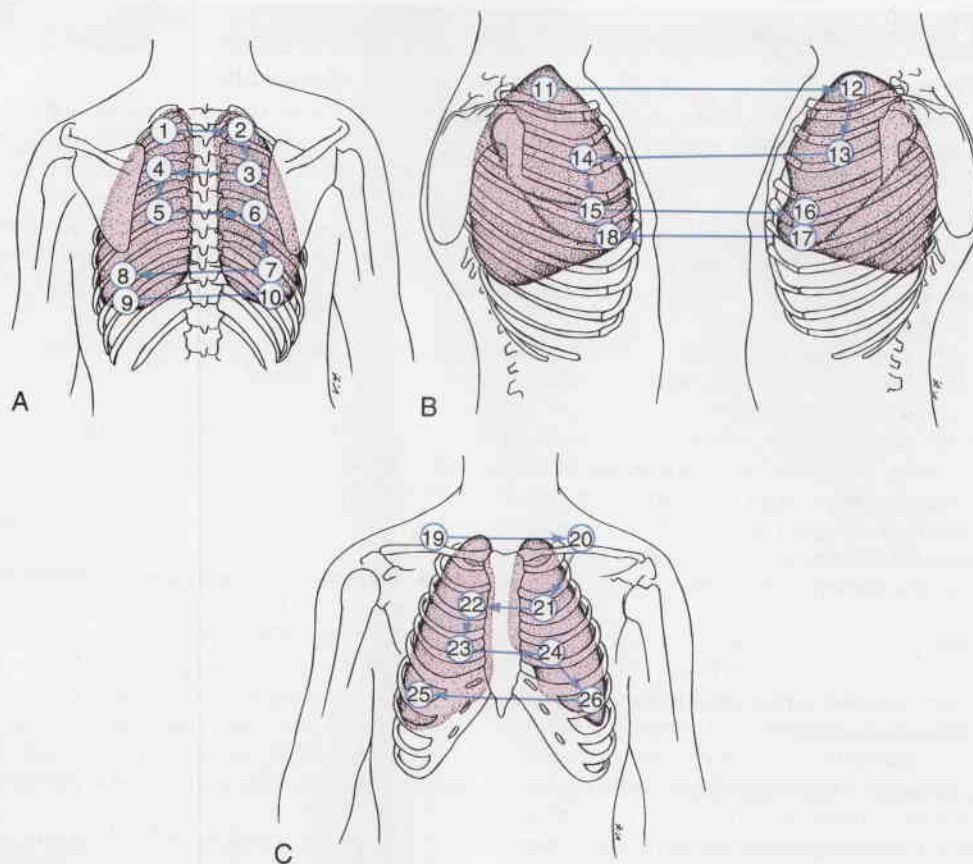


Figure 31-33 A to C, A systematic pattern (posterior-lateral-anterior) is followed when palpating and auscultating the thorax.

intercostal spaces, beginning at the lung apex (Figure 31-33, A), using a firm, light touch. Ask the patient to say “ninety-nine” or “one-one-one.” Palpate both sides simultaneously and symmetrically (from top to bottom) for comparison, or use one hand, quickly alternating between the two sides (Seidel et al., 2011). Normally a faint vibration is present as the patient speaks. If fremitus is faint, ask the patient to speak in a louder or lower tone of voice. Normally fremitus is symmetrical. Vibrations are strongest at the top, near the level of the tracheal bifurcation. You assess strong vibrations through the chest wall in a crying infant.

Auscultation assesses the movement of air through the tracheobronchial tree and detects mucus or obstructed airways. Normally, air flows through the airways in an unobstructed pattern. Recognizing the sounds created by normal airflow allows the nurse to detect sounds caused by airway obstruction.

Place the diaphragm of the stethoscope firmly on the skin, over the posterior chest wall between the ribs (Figure 31-34). The patient folds the arms in front of the chest and keeps the head bent forward while taking slow, deep breaths with the mouth slightly open. Listen to an entire inspiration and expiration at each position of the stethoscope. If sounds are faint, as in the obese patient, ask the patient to breathe harder and faster temporarily. Breath sounds are much louder in children because of their thin chest walls. In children, the bell works best because of a child’s small chest. Use a systematic pattern comparing lung sounds in one region on one side of the body with sounds in the same region on the opposite side. It is

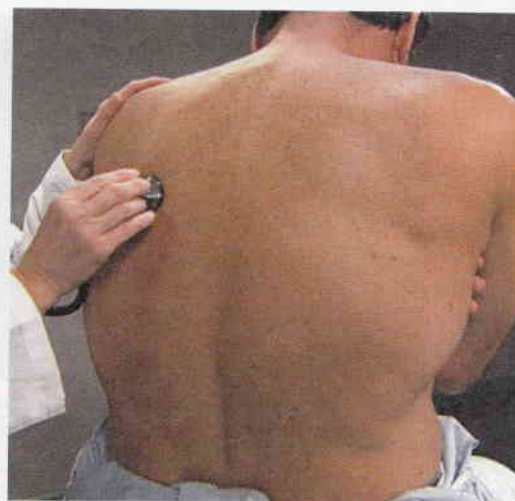


Figure 31-34 Use the diaphragm of the stethoscope to auscultate breath sounds. **Source:** From Seidel, H. M., et al. (2011). *Mosby’s guide to physical examination* (7th ed., p. 354). St Louis, MO: Mosby.

impossible to remember the quality of all sounds noted on one side of the body and then compare them with sounds on the other side (see Figure 31-32, A).

Auscultate for normal breath sounds and abnormal or **adventitious sounds**. Normal breath sounds differ in character, depending on the area you are auscultating. You normally

► TABLE 31-20 Normal Breath Sounds

Description	Location	Origin
Vesicular Vesicular sounds are soft, breezy, and low pitched. Inspiratory phase is 3 times longer than expiratory phase.	Best heard over lung's periphery (except over scapula)	Created by air moving through smaller airways
Bronchovesicular Bronchovesicular sounds are blowing sounds that are medium pitched and of medium intensity. Inspiratory phase is equal to expiratory phase.	Best heard posteriorly between scapulae and anteriorly over bronchioles lateral to sternum at first and second intercostal spaces	Created by air moving through large airways
Bronchial Bronchial sounds are loud and high pitched with hollow quality. Expiration lasts longer than inspiration (3:2 ratio).	Heard only over trachea	Created by air moving through trachea close to chest wall

hear bronchovesicular and vesicular sounds over the posterior thorax (Table 31-20).

Abnormal sounds result from air passing through moisture, mucus, or narrowed airways. They also result from alveoli suddenly reinflating or from an inflammation between the pleural linings of the lung. Adventitious sounds often occur superimposed over normal sounds. The four types of adventitious sounds are crackles, rhonchi, wheezes, and pleural friction rub. A specific entity causes each sound, and each has typical auditory features (Table 31-21). During auscultation note the location and characteristics of the sounds, and listen for the absence of breath sounds (found in patients with collapsed or surgically removed lobes).

If there are abnormalities in tactile fremitus or auscultation, perform the vocal resonance tests (spoken and whispered voice sounds). Place the stethoscope over the same locations used to assess breath sounds, and have the patient say “ninety-nine” in a normal voice tone. Normally, the sound is muffled. If fluid is compressing the lung, the vibrations from the patient’s voice are transmitted to the chest wall and the sound becomes clear (**bronchophony**). Then ask the patient to whisper “ninety-nine.” The whispered voice is usually faint and indistinct. Certain lung abnormalities cause the whispered voice to become clear and distinct (**whispered pectoriloquy**). Bronchophony and whispered pectoriloquy can be indicative of lung disorders such as pneumonia, asthma, chronic obstructive pulmonary disease (COPD), and lung tumours and suggest the need for diagnostic assessment.

Lateral Thorax

Extend the assessment of the posterior thorax to the lateral sides of the chest. The patient sits during examination of the lateral chest. Have the patient raise the arms, to improve access to lateral thoracic structures. Use inspection, palpation, and auscultation skills to examine the lateral thorax (see Figure 31-33, B). Do not assess excursion laterally. Normally, the breath sounds you hear are vesicular.

Anterior Thorax

Inspect the anterior thorax for the same features as the posterior thorax. The patient sits or lies down with the head elevated (Box 31-19). Observe the accessory muscles of breathing: sternocleidomastoid, trapezius, and abdominal muscles. The accessory muscles move little with normal passive breathing.

When an adult patient requires effort to breathe as a result of strenuous exercise or disease (e.g., COPD), the accessory muscles and abdominal muscles contract. Some patients produce a grunting sound. In children, an increased effort to breathe can cause an increased use of accessory muscles of the neck and chest, resulting in nasal flaring, tracheal tug (indrawing of the suprasternal area), and chest wall retractions. Children sometimes produce an audible wheeze or barking sounds.

Observe the width of the costal angle. It is usually larger than 90 degrees between the two costal margins. Observe the breathing pattern. Normal breathing is quiet and barely audible near the open mouth. You most often assess respiratory rate and rhythm anteriorly (see Chapter 30). The male patient’s respirations are usually diaphragmatic, whereas a female’s are more costal. Accurate assessment occurs as a patient breathes passively.

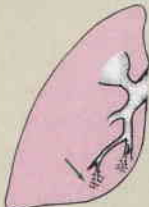
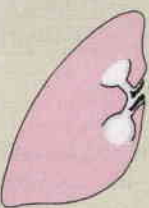
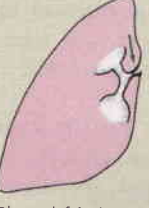
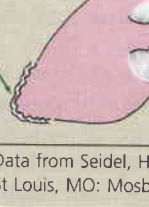
Palpate the anterior thoracic muscles and skeleton for lumps, masses, tenderness, or unusual movement. The sternum and xiphoid are relatively inflexible. Place the thumbs parallel along the costal margin approximately 6 cm apart with the palms touching the anterolateral chest. Push the thumbs toward the midline to create a skin fold. As the patient inhales deeply, the thumbs normally separate approximately 3 to 5 cm, with each side expanding equally.

Assess tactile fremitus over the anterior chest wall. Anterior findings differ from posterior findings because of the heart and female breast tissue. You feel fremitus next to the sternum at the second intercostal space, at the level of the bronchial bifurcation. It decreases over the heart, lower thorax, and breast tissue.

Auscultation of the anterior thorax follows a systematic pattern (see Figure 31-33, C). Have the patient sit, if possible, to maximize chest expansion. Give special attention to the lower lobes, where mucous secretions commonly gather. Listen for bronchovesicular and vesicular sounds above and below the clavicles and along the lung periphery. Auscultate also for bronchial sounds, which are loud, high pitched, and hollow sounding, with expiration lasting longer than inspiration (3:2 ratio). You normally hear this sound over the trachea.

Use a systematic pattern when comparing the right and left sides (see Figure 31-34). Initially, you may want to auscultate all of the left side and then return to the right side. This is

► TABLE 31-21 Adventitious Breath Sounds

Sound	Site Auscultated	Cause	Character
Crackles 	Are most common in dependent lobes: right and left lung bases	Random, sudden reinflation of groups of alveoli; disruptive passage of air through small airways	Fine crackles are high-pitched fine, short, interrupted crackling sounds heard during end of inspiration, usually not cleared with coughing. Medium crackles are lower, more moist sounds heard during middle of inspiration; not cleared with coughing. Coarse crackles are loud, bubbly sounds heard during inspiration; not cleared with coughing.
Rhonchi (sonorous wheeze) 	Are primarily heard over trachea and bronchi; if loud enough, you are able to hear over most lung fields	Muscular spasm, fluid, or mucus in larger airways, new growth or external pressure causing turbulence	Loud, low-pitched, rumbling coarse sounds heard most often during inspiration or expiration; sometimes cleared by coughing.
Wheezes (sibilant wheeze) 	Heard over all lung fields	High-velocity airflow through severely narrowed or obstructed airway	High-pitched, continuous musical sounds like a squeak heard continuously during inspiration or expiration; usually louder on expiration.
Pleural friction rub 	Heard over anterior lateral lung field (if patient is sitting upright)	Inflamed pleura, parietal pleura rubbing against visceral pleura	Has dry, rubbing, or grating quality heard during inspiration or expiration; does not clear with coughing; heard loudest over lower lateral anterior surface.

Data from Seidel, H. M., Ball, J. W., Dains, J. E., Flynn, J. A., Solomon, B. S., & Stewart, R. W. (2011). *Mosby's guide to physical examination* (7th ed., pp. 355–357). St Louis, MO: Mosby.

incorrect. You need to compare lung sounds in one region on one side of the body with sounds in the same region on the opposite of the body.

Heart

Compare the assessment of heart function with findings from the vascular assessment (see later section). Alterations in either system sometimes manifest as changes in the other. Some patients with signs or symptoms of heart (cardiac) problems have a life-threatening condition requiring immediate attention. In this case, act quickly and conduct only the portions of the examination that are absolutely necessary. When a patient is more stable, conduct a more thorough assessment. The nursing history (Table 31-22) provides data to help interpret physical findings.

Assess cardiac function through the anterior thorax. Form a mental image of the heart's exact location (Figure 31-35). In the adult, the heart is located in the centre of the chest

(precordium), behind and to the left of the sternum, with a small section of the right atrium extending to the right of the sternum. The base of the heart is the upper portion, and the apex is the bottom tip. The surface of the right ventricle composes most of the heart's anterior surface. A section of the left ventricle shapes the left anterior side of the apex. The apex actually touches the anterior chest wall at approximately the fourth to fifth intercostal space just medial to the left midclavicular line. This is the **apical impulse** or **point of maximal impulse (PMI)**.

An infant's heart is positioned more horizontally. The apex of the heart is at the third or fourth intercostal space, just to the left of the midclavicular line. By the age of seven, a child's PMI is in the same location as the adult's. In tall, slender individuals, the heart hangs more vertically and is positioned more centrally. With increased stockiness and shortness, the heart tends to lie more to the left and horizontally (Jarvis et al., 2009).

To assess heart function, a clear understanding of the cardiac cycle and associated physiological events is of utmost

BOX 31-19 PATIENT TEACHING

Lung Assessment

Objectives

- Patient describes warning signs of lung disease.
- Children receive routine childhood immunizations.
- Older adult receives influenza and pneumonia vaccines annually.
- Patients will verbalize an understanding of air pollutants in the home and the importance of a smoke-free environment at home and in the community.
- Patient with chronic obstructive pulmonary disease (COPD) clears airways more effectively and reports less shortness of breath.

Teaching Strategies

- Explain risk factors for chronic lung disease and lung cancer, including cigarette smoking, history of smoking for over 20 years, exposure to environmental pollution, and radiation exposure from occupational, medical, and environmental sources. Exposure to radon and asbestos also increases risk, especially for cigarette smokers. Other risk factors include certain metals (arsenic, cadmium, chromium), some organic chemicals, and tuberculosis. Exposure to second-hand cigarette smoke increases risk for nonsmokers.
- Share brochures on lung cancer from Canadian Cancer Society with patient and family.
- Discuss warning signs of lung cancer, such as a persistent cough, sputum streaked with blood, chest pains, and recurrent attacks of pneumonia or bronchitis.
- Counsel parents of young children on benefits from receiving annual influenza and routine childhood vaccinations.
- Counsel older adult on benefits from receiving annual influenza and pneumonia vaccinations because of a greater susceptibility to respiratory infection.
- Instruct patient with COPD in coughing and pursed-lip breathing exercises.
- Refer individuals at risk for tuberculosis who visit clinics or health care centres for skin testing.

Evaluation

- Have patient describe risk factors for lung disease and cancer.
- Ask patient to identify any known risks for cancer.
- Ask patient to name warning signs for cancer.
- In a follow-up visit, review patient's immunization record.
- Observe patient performing breathing exercises and coughing.

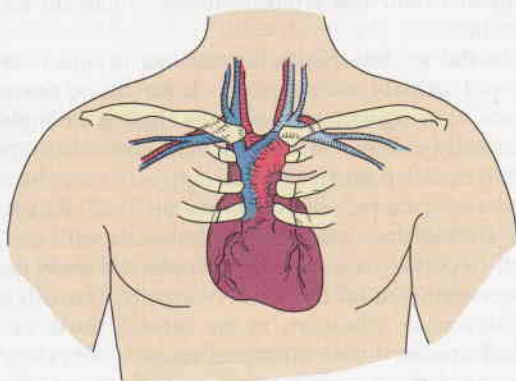


Figure 31-35 Anatomical position of the heart.

TABLE 31-22 Nursing History for Heart Assessment

Assessment Category

Determine history of smoking, alcohol intake, caffeine intake, use of prescriptive and recreational drugs, exercise habits, and dietary patterns and intake (including fat and sodium intake).

Determine if patient is taking medications for cardiovascular function (e.g., antidysrhythmias, antihypertensives) and if patient knows their purpose, dosage, and side effects.

Assess for chest pain or discomfort, palpitations, excess fatigue, cough, dyspnea, leg pain or cramps, edema of feet, cyanosis, fainting, and orthopnea. Ask if symptoms occur at rest or during exercise.

If patient reports chest pain, determine if it is cardiac in nature. Anginal pain is usually a deep pressure or ache that is substernal and diffuse, radiating to one or both arms, neck, or jaw.

Determine whether patient has a stressful lifestyle. What physical demands or emotional stress exists?

Assess family history for heart disease, diabetes, high cholesterol levels, hypertension, stroke, or rheumatic heart disease.

Ask patient about history of heart trouble (e.g., heart failure, congenital heart disease, coronary artery disease, dysrhythmias, murmurs).

Determine whether patient has preexisting diabetes, lung disease, obesity, or hypertension.

Rationale

Smoking, alcohol ingestion, cocaine use, lack of regular exercise, and intake of foods high in carbohydrates, fats, and cholesterol are risk factors for cardiovascular disease. Caffeine can cause heart dysrhythmias.

Knowledge allows nurse to assess compliance with drug therapies. Medications sometimes affect vital sign values.

These are key symptoms of heart disease. Cardiovascular function is sometimes adequate during rest but not during exercise.

Determines nature of pain and need to initiate care immediately.

Repeated exposure to stress increases risk for heart disease.

Factors increase risk for heart disease.

Knowledge reveals patient's level of understanding of condition. Preexisting condition influences examination techniques used, as well as findings to expect.

These disorders alter heart function.

importance (Figure 31-36). The heart normally pumps blood through its four chambers in a methodical, even sequence. Events on the left side occur just before those on the right. As blood flows through each chamber, the valves open and close, the pressures within the chambers rise and fall, and the chambers contract. Each event creates a physiological sign. Both sides of the heart function in a coordinated fashion.

There are two phases to the cardiac cycle: systole and diastole. During systole, the ventricles contract and eject blood

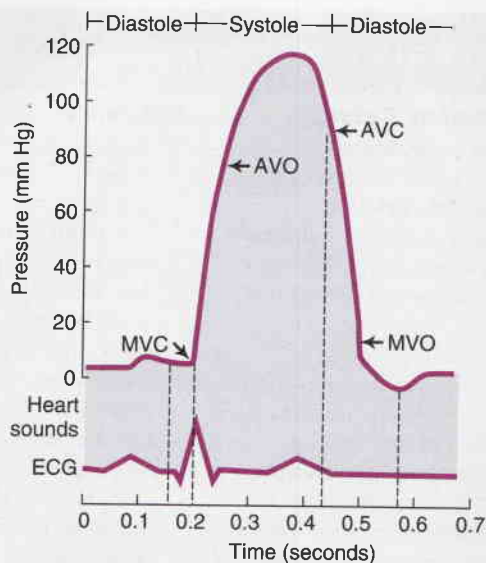


Figure 31-36 Cardiac cycle. MVC, Mitral valve closes; AVO, aortic valve opens; AVC, aortic valve closes; MVO, mitral valve opens.

from the left ventricle into the aorta and from the right ventricle into the pulmonary artery. During diastole, the ventricles relax and the atria contract to move blood into the ventricles and fill the coronary arteries.

Heart sounds occur in relation to physiological events in the cardiac cycle. As systole begins, ventricular pressure rises and closes the mitral and tricuspid valves. Valve closure causes the first heart sound (S_1), often described as “lub.” The ventricles then contract, and blood flows through the aorta and pulmonary circulation. After the ventricles empty, ventricular pressure falls below that in the aorta and pulmonary artery. This allows the aortic and pulmonic valves to close, causing the second heart sound (S_2), described as “dub.” As ventricular pressure continues to fall, it drops below that of the atria. The mitral and tricuspid valves reopen to allow ventricular filling. Rapid ventricular filling creates a third heart sound (S_3), heard more often in children and young adults. An S_3 is also an abnormality in adults over 30 years of age. A fourth heart sound (S_4) occurs when the atria contract to enhance ventricular filling. You will hear an S_4 in healthy older adults, children, and athletes, but it is not normal in adults. Because S_4 also indicates an abnormal condition, report it to a health care provider.

Inspection and Palpation

Before the examination, ensure that the patient is relaxed and comfortable. Explain the procedure to relieve the patient's anxiety. An anxious or uncomfortable patient will have mild tachycardia, which will lead to inaccurate findings.

Use the skills of inspection and palpation simultaneously. The examination begins with the patient in the supine position or with the upper body elevated 45 degrees because patients with heart disease frequently suffer shortness of breath while lying flat. Stand at the patient's right side. Do not let the patient talk, especially when auscultating heart sounds. Good lighting in the room is essential.

Direct your attention to the anatomical sites best suited for assessment of cardiac function. During inspection and palpation, look for visible pulsations and exaggerated lifts, and

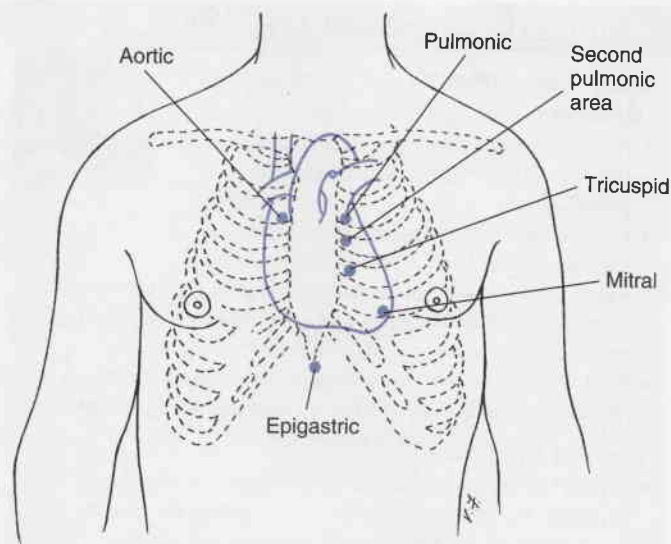


Figure 31-37 Anatomical sites for assessment of cardiac function.

palpate for the apical impulse and any source of vibrations (thrills). Follow an orderly sequence, beginning with assessment of the base of the heart and moving toward the apex. First inspect the angle of Louis, which lies between the sternal body and manubrium, and feel the ridge in the sternum approximately 5 cm below the sternal notch. Slip the fingers along the angle on each side of the sternum to feel adjacent ribs. The intercostal spaces are just below each rib. The second intercostal space allows identification of each of the six anatomical landmarks (Figure 31-37). The second intercostal space on the right is the aortic area, and the left second intercostal space is the pulmonic area. You will need deeper palpation to feel the spaces in obese or heavily muscled patients. After locating the pulmonic area, move the fingers down the patient's left sternal border to the third intercostal space, called the second pulmonic area. The tricuspid area is located at the fourth or fifth intercostal space along the sternum. To find the apical or mitral area, locate the fifth intercostal space just to the left of the sternum and move the fingers laterally, to the left midclavicular line. Locate the apical area with the palm of the hand or the fingertips. Normally you feel the apical impulse as a light tap in an area 1 to 2 cm in diameter at the apex (Figure 31-38). Another landmark is the epigastric area at the tip of the sternum. You typically use it to palpate for aortic abnormalities.

Locate the six anatomical landmarks of the heart, and inspect and palpate each area. Look for the appearance of pulsations, viewing each area over the chest at an angle to the side. Normally you will not see any pulsations, except perhaps at the PMI in thin patients or at the epigastric area as a result of abdominal aorta pulsation. Use the proximal halves of the four fingers together, and then alternate this with the ball of the hand to palpate for pulsations. Touch the areas gently to allow movements to lift the hand. Normally, you will not feel any pulsations or vibrations in the second, third, or fourth intercostal spaces. Loud murmurs cause a vibration. Time palpated pulsations or vibrations and their occurrence in relation to systole or diastole by auscultating heart sounds simultaneously.



Figure 31-38 Palpation of apical pulse. **Source:** From Seidel, H. M., et al. (2011). *Mosby's guide to physical examination* (7th ed., p. 394). St Louis, MO: Mosby.

You should feel the apical impulse or PMI easily. If you do not find it, have the patient roll onto the left side, moving the heart closer to the chest wall. Estimate the size of the heart by noting the diameter of the PMI and its position relative to the midclavicular line. In cases of serious heart disease, the cardiac muscle enlarges, with the PMI found to the left of the midclavicular line. The PMI is sometimes difficult to find in the older adult because the chest deepens in its anteroposterior diameters. It is also difficult to find in muscular or overweight patients. You usually find an infant's PMI near the third or fourth intercostal space. It is easy to palpate because of the child's thin chest wall.

Auscultation

Auscultation of the heart detects normal heart sounds, extra heart sounds, and murmurs. Concentrate on detecting low-intensity sounds created by valve closures. To begin auscultation, eliminate all sources of room noise and explain the procedure to reduce the patient's anxiety. Follow a systematic pattern beginning at the aortic area and inching the stethoscope across each of the anatomical sites (Figure 31-39). Listen for the complete cycle ("lub-dub") of heart sounds clearly at each location. Then repeat the sequence using the bell of the stethoscope. Sometimes the patient will assume three different positions during the examination (Figure 31-39): sitting up and leaning forward (good for all areas and to hear high-pitched murmurs), supine (good for all areas), and left lateral recumbent (good for all areas; best position to hear low-pitched sounds in diastole).

Learn to identify the first (S_1) and second (S_2) heart sounds. At normal rates, S_1 occurs after the long diastolic pause and preceding the short systolic pause. S_1 is high pitched, dull in quality, and heard best at the apex. If it is difficult to hear S_1 , time it in relation to the carotid pulsation. S_2 follows the short systolic pause and precedes the long diastolic pause; you hear it best at the aortic area.

Auscultate for rate and rhythm after hearing both sounds clearly. Each combination of S_1 and S_2 or "lub-dub" counts as one heartbeat. Count the rate for one minute, and listen for the interval between S_1 and S_2 , and then the time between S_2 and



Figure 31-39 Sequence of patient positions for heart auscultation. **A,** Sitting. **B,** Supine. **C,** Left lateral recumbent. **Source:** From Seidel, H. M., et al. (2011). *Mosby's guide to physical examination* (7th ed., p. 394). St Louis, MO: Mosby.

the next S_1 . A regular rhythm involves regular intervals of time between each sequence of beats. There is a distinct silent pause between S_1 and S_2 . Failure of the heart to beat at regular successive intervals is a **dysrhythmia**. Some dysrhythmias are life threatening.

When assessing an irregular heart rhythm, compare apical and radial pulse rates simultaneously to determine if a pulse deficit exists. Auscultate the apical pulse first, and then immediately palpate the radial pulse (one-examiner technique). Assess the apical and radial rates at the same time when two examiners are present. When a patient has a **pulse deficit**, the radial pulse is slower than the apical pulse because

ineffective contractions fail to send pulse waves to the periphery. Report a difference in pulse rates to the health care provider immediately.

Assess for extra heart sounds at each auscultatory site. Use the bell of the stethoscope, and listen for low-pitched extra heart sounds such as S_3 and S_4 gallops, clicks, and rubs. Auscultate over all anatomical areas. S_3 , or a **ventricular gallop**, occurs just after S_2 at the end of ventricular diastole. This is due to a premature rush of blood into a ventricle that is stiff or dilated as a result of heart failure and hypertension. The combination of S_1 , S_2 , and S_3 sounds like “Ken-tuck’y-y.”

S_4 , or an atrial gallop, occurs just before S_1 or ventricular systole. The sound of an S_4 is similar to that of “Ten’es-see.” Physiologically, it is due to an atrial contraction pushing against a ventricle that is not accepting blood because of heart failure or other alterations. You hear extra heart sounds more easily with the patient lying on the left side and the stethoscope at the apical site.

The final portion of the examination includes assessment for heart murmurs. **Murmurs** are sustained swishing or blowing sounds heard at the beginning, middle, or end of the systolic or diastolic phase. They are due to increased blood flow through a normal valve, forward flow through a stenotic valve or into a dilated vessel or heart chamber, or backward flow through a valve that fails to close. A murmur is asymptomatic or a sign of heart disease (Box 31-20). Murmurs are common in children. Keep the following factors in mind when auscultating to detect murmurs:

- When you detect a murmur, auscultate the mitral, tricuspid, aortic, and pulmonic valve areas for placement in the cardiac cycle (timing), the place it is heard best (location), radiation, loudness, pitch, and quality.
- If a murmur occurs between S_1 and S_2 , it is a systolic murmur. If it occurs between S_2 and the next S_1 , it is a diastolic murmur.
- The location of a murmur is not necessarily directly over the valves. With experience, you will learn where each type of murmur is best heard. For example, you hear mitral murmurs best at the apex of the heart.
- To assess for radiation, listen over areas besides where it is heard best. You also hear murmurs over the neck or back.
- Intensity or loudness is related to the rate of blood flow through the heart or the amount of blood regurgitated. In serious murmurs, feel for a thrust or intermittent palpable sensation at the auscultation site. A **thrill** is a continuous palpable sensation like the purring of a cat. You record intensity in the following grades (Seidel et al., 2011):
Grade 1: Barely audible in a quiet room
Grade 2: Clearly audible but quiet
Grade 3: Moderately loud
Grade 4: Loud, with associated thrill
Grade 5: Very loud, thrill easily palpable
Grade 6: Louder, may be heard without stethoscope, thrill palpable and visible
- A murmur is low, medium, or high in pitch, depending on the velocity of blood flow through the valves. You hear a low-pitched murmur best with the bell of the stethoscope. If you hear it best with the diaphragm, the murmur is high pitched.

The quality of a murmur refers to its characteristic pattern and sound. A crescendo murmur starts softly and builds in loudness. A decrescendo murmur starts loudly and then becomes less intense.

BOX 31-20 PATIENT TEACHING

Heart Assessment

Objectives

- Patient describes risk factors for heart disease and takes appropriate steps to eliminate risks from lifestyle.
- Patient with risk for heart disease will seek support from appropriate caregivers.

Teaching Strategies

- Explain risk factors for heart disease, including high dietary intake of saturated fat or cholesterol, lack of regular aerobic exercise, smoking, excess weight, stressful lifestyle, hypertension, and family history of heart disease.
- Refer patient (if appropriate) to resources available for controlling or reducing risks (e.g., nutritional counselling, exercise class, stress reduction programs).
- Explain that research shows clinical benefit from reducing dietary intake of cholesterol and saturated fats. Tell patient that about 70% to 75% of saturated fatty acids come from meats, poultry, fish, and dairy products. The Canadian Heart and Stroke Foundation recommends a diet low in saturated fatty acids and high in dietary fibre (Canadian Heart and Stroke Foundation, n.d.).
- Encourage patient to have regular measurement of total blood cholesterol levels and triglycerides. Desirable levels are less than 5.2 mmol/L for cholesterol and below 2.2 mmol/L for triglycerides. You need more than one cholesterol measurement to assess the blood cholesterol level accurately. Low-density lipoprotein (LDL) cholesterol is the major component of atherosclerotic plaques. Separate measurement of LDL cholesterol is wise in a patient with high total blood cholesterol levels. In an individual with no other risk factors, lipid-lowering therapy is advised when the LDL cholesterol level is above 5.0 mmol/L or the total cholesterol to high-density lipoprotein ratio is greater than 6.0 (McPherson et al., 2006). Cardiovascular risk can be assessed using the Framingham Risk Score (D’Agostino et al., 2008).
- Advise patient to avoid cigarette smoke because nicotine causes vasoconstriction.
- Advise patient to quit smoking because this lowers the risk for coronary heart disease.
- Patients who are at risk benefit from taking a daily low dose of aspirin. Consult health care provider before starting therapy.

Evaluation

- Ask patient to identify risk factors for heart disease.
- Have patient develop a meal plan low in saturated fat and cholesterol.
- Check patient’s cholesterol level during follow-up appointments at the clinic or physician’s office.



Vascular System

Examination of the vascular system includes measuring the blood pressure (see Chapter 30) and assessing the integrity of the peripheral vascular system. Table 31-23 reviews the nursing history data collected before the examination. Use the skills of inspection, palpation, and auscultation. Perform portions of the vascular examination during other body systems assessments. For example, check the carotid pulse after palpating the cervical lymph nodes. Note signs and symptoms of arterial and venous insufficiency when assessing the skin.

► TABLE 31-23

Nursing History for Vascular Assessment

Assessment Category

Rationale

Determine if patient experiences leg cramps, numbness or tingling in extremities, sensation of cold hands or feet, pain in legs, or swelling or cyanosis of feet, ankles, or hand.

These signs and symptoms indicate vascular disease.

If patient experiences leg pain or cramping in lower extremities, ask if walking or standing for long periods or during sleep aggravates or relieves it.

Relationship of symptoms to exercise will clarify whether problem is vascular or musculoskeletal. Pain caused by vascular condition tends to increase with activity. Musculoskeletal pain is not usually relieved when exercise ends.

Ask patients if they wear tight-fitting garters or hosiery and sit or lie in bed with legs crossed.

Tight hosiery around lower extremities and crossing legs can impair venous return.

Reconsider previous heart risk factors (e.g., smoking, exercise, nutritional problems).

These predispose patient to vascular disease.

Assess medical history for heart disease, hypertension, phlebitis, diabetes, or varicose veins.

Circulatory and vascular disorders influence findings gathered during examination.

Blood Pressure

When auscultating blood pressure, know that readings between the arms vary by as much as 10 mm Hg and tend to be higher in the right arm (Jarvis et al., 2009). Always record the higher reading. Systolic readings that differ by 15 mm Hg or more suggest atherosclerosis or disease of the aorta.

Carotid Arteries

When the left ventricle pumps blood into the aorta, the arterial system transmits pressure waves. The carotid arteries reflect heart function better than peripheral arteries because their pressure correlates with that of the aorta. The carotid artery supplies oxygenated blood to the head and neck (Figure 31-40). The overlying sternocleidomastoid muscle protects it.

To examine the carotid arteries, have the patient sit or lie supine with the head of the bed elevated 30 degrees. Examine one carotid artery at a time. If both arteries are simultaneously occluded during palpation, the patient will lose consciousness as a result of inadequate circulation to the brain. Do not palpate or massage the carotid arteries vigorously because the carotid sinus is located at the bifurcation of the common carotid arteries in the upper third of the neck. This sinus sends impulses along the vagus nerve. Its stimulation causes a reflex drop in heart rate and blood pressure, which causes **syncope** or circulatory arrest. This is a particular problem for older adults.

Begin inspection of the neck for obvious pulsation of the artery. Have the patient turn the head slightly away from the

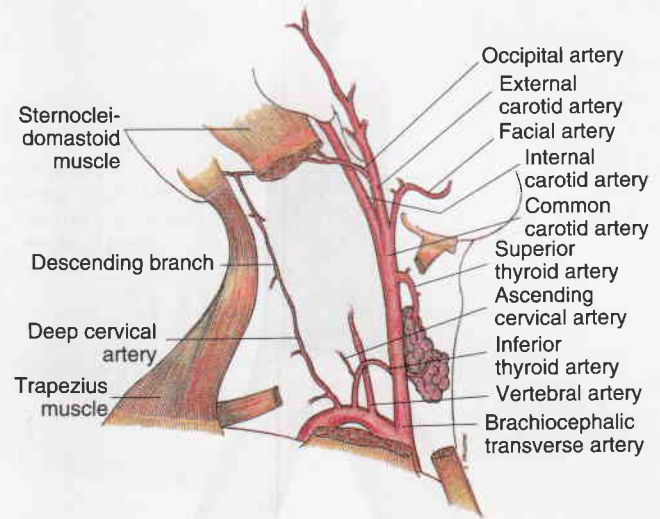


Figure 31-40 Anatomical position of the carotid artery.

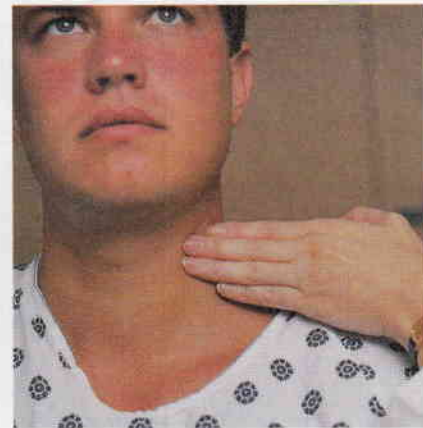


Figure 31-41 Palpation of internal carotid artery along the margin of the sternocleidomastoid muscle.

artery being examined. Sometimes the wave of the pulse is visible. The carotid is the only site for assessing the quality of a pulse wave. An absent pulse wave indicates arterial **occlusion** (blockage) or **stenosis** (narrowing).

To palpate the pulse, ask the patient to look straight ahead or turn the head slightly toward the side you are examining. Turning relaxes the sternocleidomastoid muscle. Slide the tips of the index and middle fingers around the medial edge of the sternocleidomastoid muscle. Gently palpate to avoid occlusion of circulation (Figure 31-41).

The normal carotid pulse is localized rather than diffuse. As a strong pulse, the carotid has a thrusting quality. As the patient breathes, no change occurs. Rotation of the neck or a shift from a sitting to a supine position does not change the carotid artery's quality. Both carotid arteries are normally equal in pulse rate, rhythm, and strength and are equally elastic. Diminished or unequal carotid pulsations indicate **atherosclerosis** or other forms of arterial disease.

The carotid is the most commonly auscultated pulse. Auscultation is especially important for middle-aged or older adults or patients suspected of having cerebrovascular disease.

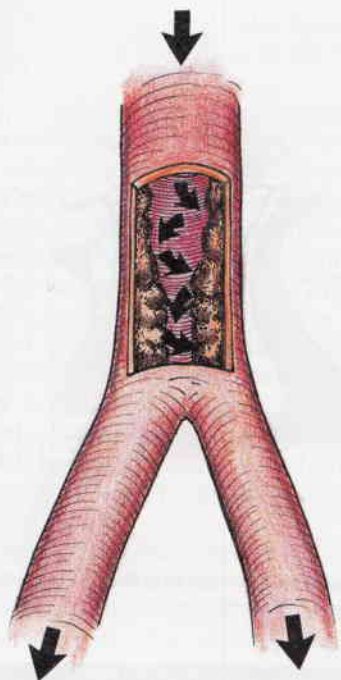


Figure 31-42 Occlusion or narrowing of the carotid artery disrupts normal blood flow. The resultant turbulence creates a sound (bruit) that is auscultated.



Figure 31-43 Auscultation for carotid artery bruit. **Source:** From Seidel, H. M., et al. (2011). *Mosby's guide to physical examination* (7th ed., p. 436). St Louis, MO: Mosby.

When the lumen of a blood vessel is narrowed, this disturbs blood flow. As blood passes through the narrowed section, this creates turbulence, causing a blowing or swishing sound. The blowing sound is called a **bruit** (pronounced "brew-ee") (Figure 31-42).

Place the bell of the stethoscope over the carotid artery at the lateral end of the clavicle and the posterior margin of the sternocleidomastoid muscle. Have the patient turn the head slightly away from the side being examined (Figure 31-43). Ask

the patient to hold the breath for a moment so that breath sounds do not obscure a bruit. Normally, you do not hear any sounds during carotid auscultation. Palpate the artery lightly for a thrill (palpable bruit) if you hear a bruit.

Jugular Veins

The most accessible veins for examination are the internal and external jugular veins in the neck. Both veins drain bilaterally from the head and neck into the superior vena cava. The external jugular vein lies superficially and is just above the clavicle. The internal jugular vein lies deeper, along the carotid artery.

It is best to examine the right internal jugular vein because it follows a more direct anatomical path to the right atrium of the heart. The column of blood inside the internal jugular vein serves as a manometer, reflecting pressure in the right atrium. The higher the column, the greater the venous pressure. Raised venous pressure reflects right-sided heart failure.

Normally, when a patient lies in the supine position, the external jugular vein distends and becomes easily visible. In contrast, the jugular veins normally flatten when the patient is in a sitting or standing position. Some patients with heart disease, however, have distended jugular veins when sitting.

To measure venous pressure, inspect the jugular veins. Blood volume, the capacity of the right atrium to receive blood and send it to the right ventricle, and the ability of the right ventricle to contract and force blood into the pulmonary artery all influence venous pressure. Any factor resulting in greater blood volume within the venous system results in elevated venous pressure. Assess venous pressure by using the following steps:

1. Ask the patient to lie supine with the head elevated 30 to 45 degrees (semi-Fowler's position).
2. Expose the neck and upper thorax. Use a pillow to align the head. Avoid neck hyperextension or flexion to ensure that the vein is not stretched or kinked (Figure 31-44).
3. Usually pulsations are not evident with the patient sitting up. As the patient slowly leans back into a supine position, the level of venous pulsations begins to rise above the level of the manubrium as much as 1 or 2 cm as the patient reaches a 45-degree angle. Measure venous pressure by measuring the vertical distance between the angle of Louis and the highest level of the visible point of the internal jugular vein pulsation.
4. Use two rulers. Line up the bottom edge of a regular ruler with the top of the area of pulsation in the jugular vein. Then take a centimetre ruler and align it perpendicular to the first ruler at the level of the sternal angle. Measure in centimetres the distance between the second ruler and the sternal angle (Figure 31-45).
5. Repeat the same measurement on the other side. Bilateral pressures higher than 2.5 cm are considered elevated and are a sign of right-sided heart failure. One-sided pressure elevation is due to obstruction.

Peripheral Arteries and Veins

To examine the peripheral vascular system, first assess the adequacy of blood flow to the extremities by measuring arterial pulses and inspecting the condition of the skin and nails. Next assess the integrity of the venous system. Assess the arterial pulses in the extremities to determine sufficiency of the entire arterial circulation.

Factors such as coagulation disorders, local trauma or surgery, constricting casts or bandages, and systemic diseases

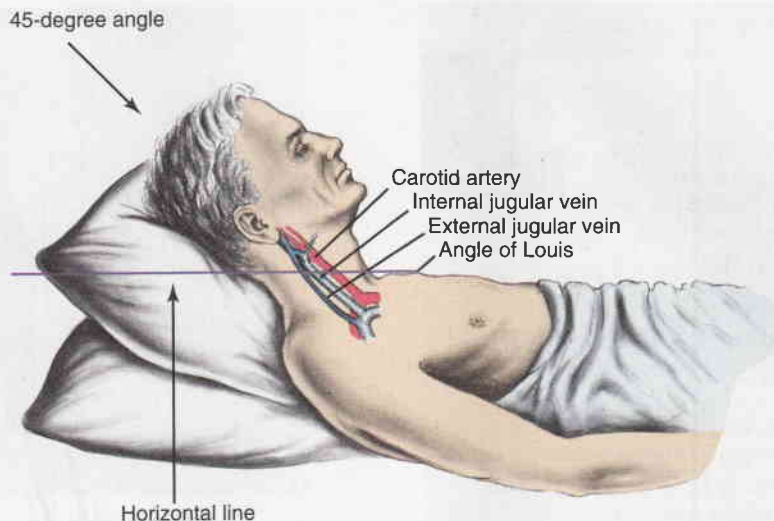


Figure 31-44 Position of patient to assess jugular vein distension. **Source:** From Seidel, H. M., et al. (2011). *Mosby's guide to physical examination* (7th ed., p. 429). St Louis, MO: Mosby.



Figure 31-45 Measuring jugular venous pressure. **Source:** From Seidel, H. M., et al. (2011). *Mosby's guide to physical examination* (7th ed., p. 442). St Louis, MO: Mosby.

► **TABLE 31-24**

Indicators for Assessing Local Blood Flow

Indicator	Rationale
Systemic diseases (e.g., arteriosclerosis, atherosclerosis, diabetes)	Diseases result in changes in integrity of walls of arteries and smaller blood vessels.
Coagulation disorders (e.g., thrombosis, embolus)	Blood clot causes mechanical obstruction to blood flow.
Local trauma or surgery (e.g., contusion, fracture, vascular surgery)	Direct manipulation of vessels or localized edema impairs blood flow.
Application of constricting devices (e.g., casts, dressings, elastic bandages, restraints)	Constriction causes tourniquet effect, impairing blood flow to areas below site of constriction.

impair circulation to the extremities (Table 31-24). Discuss risk factors and ways to monitor for circulatory problems with the patient (Box 31-21).

Peripheral Arteries. Examine each peripheral artery using the distal pads of the second and third fingers. The thumb helps anchor the brachial and femoral artery. Apply firm pressure but avoid occluding a pulse. When a pulse is difficult to find, it helps to vary pressure and feel all around the pulse site. Be sure not to palpate your own pulse.

Routine vital signs usually include assessment of the rate and rhythm of the radial artery because it is easily accessible. Count the pulse for either 30 seconds or a full minute, depending on the character of the pulse. Always count an irregular pulse for 60 seconds. With palpation, normally feel the pulse wave at regular intervals. When an interval is interrupted by an early, late, or missed beat, the pulse rhythm is irregular. In emergencies, health care providers usually assess the carotid artery because it is accessible and most useful in evaluating heart activity. To check local circulatory status of tissues, palpate the peripheral arteries long enough to note that a pulse is present.

Assess each peripheral artery for elasticity of the vessel wall, strength, and equality. The arterial wall is normally elastic, making it easily palpable. After depressing the artery, it will spring back to shape when releasing the pressure. An abnormal artery is hard, inelastic, or calcified.

The strength of a pulse is a measurement of the force at which blood is ejected against the arterial wall. Some examiners use a scale rating from 0 to 4+ for the strength of a pulse (Seidel et al., 2011):

- 0 Absent, not palpable
- 1+ Pulse diminished, barely palpable
- 2+ Expected/normal
- 3+ Full pulse, increased
- 4+ Bounding pulse

Measure all peripheral pulses for equality and symmetry. Compare the left radial pulse with that of the right, and so on. Lack of symmetry indicates impaired circulation such as a localized obstruction or an abnormally positioned artery.

In the upper extremities, the brachial artery channels blood to the radial and ulnar arteries of the forearm and hand. If circulation in this artery becomes blocked, the hands will not

* BOX 31-21 PATIENT TEACHING

Vascular Assessment

Objectives

- Patient will know normal blood pressure range for age and compare it with own blood pressure readings to identify normalcy of blood pressure.
- Patient with vascular insufficiency will avoid activities that worsen circulatory status.

Teaching Strategies

- Tell patient the blood pressure reading. Explain the normal reading for the patient's age. Discuss implications of abnormalities.
- Instruct patient with risk or evidence of vascular insufficiency in the lower extremities to avoid tight clothing over the lower body or legs, to avoid sitting or standing for long periods, to walk regularly, and to elevate feet when sitting.
- Advise patient to avoid cigarette smoking because nicotine causes vasoconstriction.
- Identify patient with hypertension; they sometimes benefit from regular monitoring of blood pressure (daily, weekly, or monthly). Teach patient how to use home-monitoring kits (see Chapter 30).

Evaluation

- Ask patient to identify if blood pressure reading is within normal limits for age.
- Have patient with vascular insufficiency describe precautions to take to avoid further circulatory deficiency.
- Have patient demonstrate self-monitoring of blood pressure.

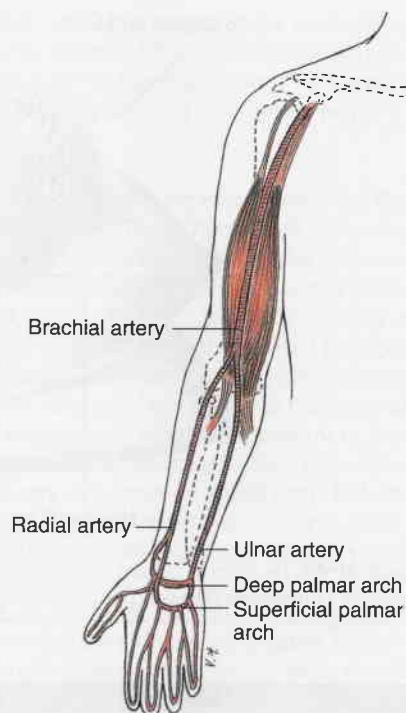


Figure 31-46 Anatomical positions of brachial, radial, and ulnar arteries.

receive adequate blood flow. If circulation in the radial or ulnar arteries becomes impaired, the hand will still receive adequate perfusion. An interconnection between the radial and ulnar arteries guards against arterial occlusion (Figure 31-46).

To locate pulses in the arm, have the patient sit or lie down. Find the radial pulse along the radial side of the forearm at the wrist. Thin individuals have a groove lateral to the flexor tendon of the wrist. Feel the radial pulse with light palpation in the groove (Figure 31-47). The ulnar pulse is on the opposite side of the wrist and feels less prominent (Figure 31-48). Palpate the ulnar pulse only when evaluating arterial insufficiency to the hand.

To palpate the brachial pulse, find the groove between the biceps and triceps muscle above the elbow at the antecubital fossa (Figure 31-49). The artery runs along the medial side of the extended arm. Palpate the artery with the fingertips of the first three fingers in the muscle groove.

The femoral artery is the primary artery in the leg, delivering blood to the popliteal, posterior tibial, and dorsalis pedis arteries (Figure 31-50). An interconnection between the posterior tibial and dorsalis pedis arteries guards against local arterial occlusion.

Find the femoral pulse with the patient lying down with the inguinal area exposed (Figure 31-51). The femoral artery runs below the inguinal ligament, midway between the symphysis pubis and the anterosuperior iliac spine. Sometimes you will use deep palpation to feel the pulse. Bimanual palpation is effective in obese patients. Place the fingertips of both hands on opposite sides of the pulse site. Feel a pulsatile sensation when the arterial pulsation pushes the fingertips apart.

The popliteal pulse runs behind the knee. Have the patient slightly flex the knee, with the foot resting on the examination



Figure 31-47 Palpation of radial pulse.

table, or assume a prone position with the knee slightly flexed (Figure 31-52). Instruct the patient to keep leg muscles relaxed. Palpate with the fingers of both hands deeply into the popliteal fossa, just lateral to the midline. The popliteal pulse is difficult to locate.

With the patient's foot relaxed, locate the dorsalis pedis pulse. The artery runs along the top of the foot in line with the groove between the extensor tendons of the great toe and first toe (Figure 31-53). To find the pulse, place the fingertips between the first and second toes and slowly move up the dorsum of the foot. This pulse is sometimes congenitally absent.



Figure 31-48 Palpation of ulnar pulse.



Figure 31-49 Palpation of brachial pulse.

Find the posterior tibial pulse on the inner side of each ankle (Figure 31-54). Place the fingers behind and below the medial malleolus (ankle bone). With the foot relaxed and slightly extended, palpate the artery.

Tissue Perfusion. The condition of the skin, mucosa, and nail beds offers useful data about the status of circulatory blood flow. Examine the face and upper extremities, looking at the colour of the skin, mucosa, and nail beds. The presence of cyanosis requires special attention. Heart disease sometimes causes central cyanosis, which indicates poor arterial oxygenation. Some characteristics of this are a bluish discolouration of the lips, mouth, and conjunctivae. Blue lips, earlobes, and nail beds are signs of peripheral cyanosis, which indicates peripheral vasoconstriction. When cyanosis is present, consult with a health care provider to have laboratory testing of oxygen saturation to determine the severity of the problem. Examination of the nails involves inspection for clubbing, a bulging of the tissues at the nail base. **Clubbing** is due to insufficient oxygenation at the periphery resulting from conditions such as chronic emphysema and congenital heart disease.

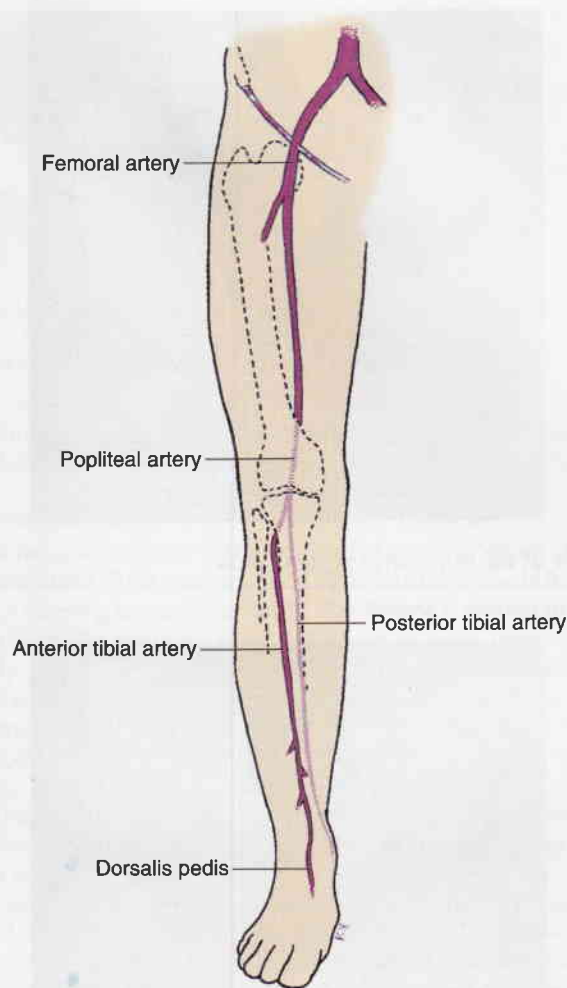


Figure 31-50 Anatomical position of femoral, popliteal, dorsalis pedis, and posterior tibial arteries.



Figure 31-51 Palpation of femoral pulse.

Inspect the lower extremities for changes in colour, temperature, and condition of the skin indicating either arterial or venous alterations (Table 31-25). This is a good time to ask the patient about any history of pain in the legs. If an arterial occlusion is present, the patient has signs resulting from an absence of blood flow. Pain will be distal to the occlusion. The *P's*—pain, pallor, pulselessness, paresthesias, and paralysis—characterize an occlusion. Venous congestion causes tissue



Figure 31-52 Palpation of popliteal pulse.



Figure 31-53 Palpation of dorsalis pedis pulse.



Figure 31-54 Palpation of posterior tibial pulse.

changes indicating an inadequate circulatory flow back to the heart.

During examination of the lower extremities, also inspect skin and nail texture; hair distribution on the lower legs, feet, and toes; the venous pattern; and scars, pigmentation, or

TABLE 31-25 Signs of Venous and Arterial Insufficiency

Assessment Criterion	Venous	Arterial
Colour	Normal or cyanotic	Pale; worsened by elevation of extremity; dusky red when extremity is lowered
Temperature	Normal	Cool (blood flow blocked to extremity)
Pulse	Normal	Decreased or absent
Edema	Often marked	Absent or mild
Skin changes	Brown pigmentation around ankles	Thin, shiny skin; decreased hair growth; thickened nails

ulcers. Palpate the legs and feet for colour and temperature. Also assess capillary refill. Measure capillary refill by blanching the nail bed with a substantial pressure for several seconds. Release the pressure, and observe the time elapsed before the nail regains its full colour. An acceptable capillary refill time is less than two seconds (Jarvis et al., 2009).

The absence of hair growth over the legs indicates circulatory insufficiency. Remember: do not confuse absence of hair on the legs with shaven legs. Also, many men have less hair around the calves from wearing tight-fitting dress socks or jeans. Chronic recurring ulcers of the feet or lower legs are a serious sign of circulatory insufficiency and require a health care provider's intervention.

Peripheral Veins. Assess the status of the peripheral veins by asking the patient to assume sitting and standing positions. Assessment includes inspection and palpation for varicosities, peripheral edema, and phlebitis. Varicosities are superficial veins that become dilated, especially when the legs are in a dependent position. They are common in older adults because the veins normally fibrose, dilate, and stretch. They are also common in people who stand for prolonged periods. Varicosities in the anterior or medial part of the thigh and the posterolateral part of the calf are abnormal.

Dependent edema around the area of the feet and ankles is a sign of venous insufficiency or right-sided heart failure. Dependent edema is common in older adults and individuals who spend a lot of time standing (e.g., waitresses, security guards, and nurses). To assess for pitting edema, use the index finger to press firmly for several seconds and then release over the medial malleolus or the shins. A depression left in the skin indicates edema. Grading 1+ through 4+ characterizes the severity of the edema (Figure 31-55).

Phlebitis is an inflammation of a vein that occurs commonly after trauma to the vessel wall, infection, immobilization, and prolonged insertion of IV catheters (see Chapter 38). Phlebitis promotes clot formation, a potentially dangerous situation because a clot within a deep vein of the leg can become dislodged and travel through the heart, causing a pulmonary embolus. To assess for phlebitis, inspect the calves for localized redness, tenderness, and swelling over vein sites. Gentle palpation of calf muscles reveals warmth, tenderness, and firmness of the muscle. Unilateral edema of the affected leg is one of the most reliable findings of phlebitis (Day, 2003). Determine if dorsiflexion of the foot (Homans' sign) causes

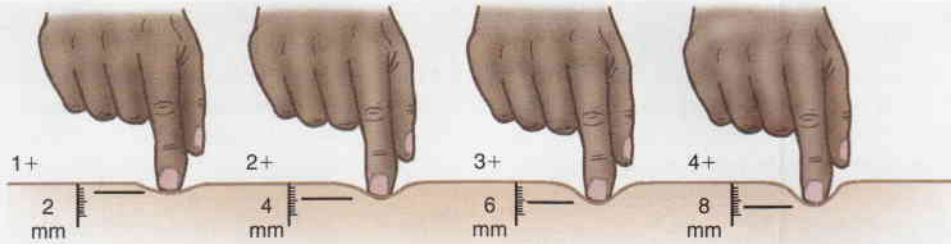


Figure 31-55 Assessing for pitting edema. **Source:** From Seidel, H. M., et al. (2011). *Mosby's guide to physical examination* (7th ed., p. 444). St Louis, MO: Mosby.

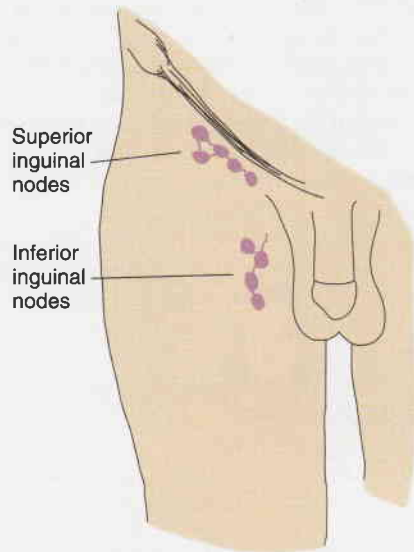


Figure 31-56 Inguinal lymph nodes. **Source:** From Seidel, H. M., et al. (2006). *Mosby's guide to physical examination* (6th ed., pp. 498–99). St Louis, MO: Mosby.

pain in the calf. However, Homans' sign is not always a reliable indicator of phlebitis and is present in other conditions (Day, 2003). Performing the Homans sign test is contraindicated in patients with deep vein thrombosis. If a clot is present, it may become dislodged from its original site during this test, resulting in a pulmonary embolism.

Lymphatic System

Assess the lymphatic drainage of the lower extremities during examination of the vascular system or during the female or male genital examination. Superficial and deep nodes drain the legs, but only two groups of superficial nodes are palpable. With the patient supine, palpate the area of the superficial inguinal nodes in the groin area (Figure 31-56). Then move the fingertips toward the inner thigh, feeling for any inferior nodes. Use a firm but gentle pressure when palpating over each lymphatic chain. Multiple nodes are not normally palpable, although a few soft, nontender nodes are not unusual. Enlarged, hardened, tender nodes reveal potential sites of infection or metastatic disease.

Breasts

It is important to examine the breasts of female and male patients. Males have a small amount of glandular tissue, a

potential site for the growth of cancer cells, in the breast. In contrast, the majority of the female breast is glandular tissue.

Female Breasts

Researchers predicted that new cases of invasive breast cancer would affect 23,200 women and 180 men in the Canada in 2010 (CCS Steering Committee, 2010). The disease is second to lung cancer as the leading cause of death in women with cancer. Early detection is the key to cure. A major responsibility for you is to teach patients health behaviours such as breast self-examination (BSE), so that men and women become knowledgeable about the normal texture and condition of their breast tissue (Box 31-22).

If the patient already performs self-examination, assess the method she uses and times she does the examination in relation to her menstrual cycle.

Older women require special attention when reviewing the need for regular BSE. Unfortunately, many older women ignore changes in their breasts, assuming that they are a part of aging. In addition, physiological factors affect the ease with which older women perform a BSE. Musculoskeletal limitations, diminished peripheral sensation, reduced eyesight, and changes in joint range of motion limit palpation and inspection abilities. It may be necessary to teach family members to perform the patient's examination.

The Canadian Cancer Society Steering Committee (2010) recommends the following guidelines for the early detection of breast cancer:

- All women need to report any breast changes to a health care provider immediately.
- Women need a clinical breast examination by a trained health care provider every two years from ages 40 to 49 years.
- Women need a clinical breast examination by a trained health care provider every two years from ages 50 to 69 years and a screening mammogram every two years.
- For women at increased risk or with a family history of breast cancer, the CCS recommends talking with the health care provider for screening options and additional testing.

The patient's history (Table 31-26) reveals normal developmental changes, as well as signs of breast disease. Because of its glandular structure, the breast undergoes changes during a woman's life. Knowing these changes (Box 31-23) allows complete and accurate assessment. Encourage both men and women to observe their breasts for changes.

Inspection. Have the patient remove the top gown or drape to allow simultaneous visualization of both breasts. Have the patient stand or sit with her arms hanging loosely at

► BOX 31-22 Breast Self-Examination

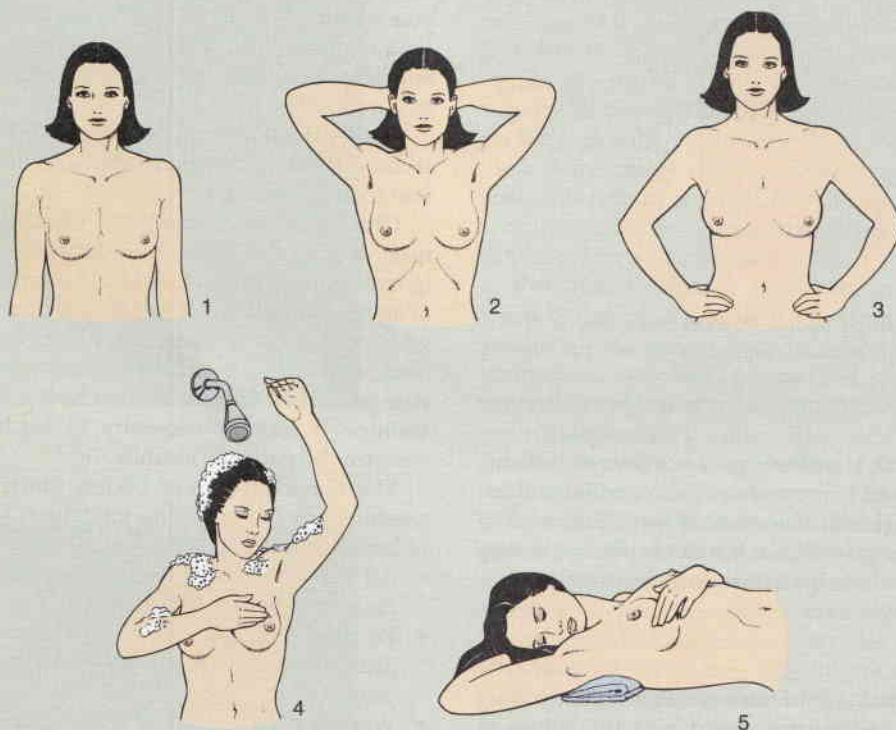
In the past, it was suggested that breast self-examination (BSE) needed to be performed once a month. Research has shown that monthly breast examinations are not as important as becoming familiar with the usual appearance and feel of your breasts. Familiarity makes it easier to notice any changes in the breast. Early discovery of a change from what is baseline is the main idea behind BSE.

If you menstruate, the best time to do BSE is two or three days after your period ends, when your breasts are least likely to be tender or swollen. If you no longer menstruate, pick a day, such as the first day of the month, to remind yourself it is time to do BSE.

Here is how to do BSE:

1. Stand before a mirror. Inspect both breasts for anything unusual, such as any discharge from the nipples, puckering, dimpling, or scaling of the skin.
The next two steps are designed to emphasize any change in the shape or contour of your breasts. As you do them, you will feel your chest muscles tighten.
2. Watching closely in the mirror, clasp hands behind your head and swing elbows forward.

3. Next, press hands firmly on hips and bow slightly toward your mirror as you pull your shoulders and elbows forward. Some women do the next part of the examination in the shower. Fingers glide over soapy skin, making it easy to appreciate the texture underneath.
4. Raise your left arm. Use three or four fingers of your right hand to explore your left breast firmly, carefully, and thoroughly. Beginning at the outer edge, press the flat part of your fingers in small circles, moving the circles slowly around the breast. Gradually work toward the nipple. Be sure to cover the entire breast. Pay special attention to the area between the breast and the armpit, including the armpit itself. Feel for any unusual lump or mass under the skin.
5. Repeat step 4 lying down. Lie flat on your back, right arm over your head and a pillow or folded towel under your right shoulder. This position flattens the breast and makes it easier to examine. Use the same circular motion described earlier.
6. Repeat on your right breast.



her sides. If possible, place a mirror in front of the patient during inspection so she sees what to look for when performing a BSE. To recognize abnormalities, the patient needs to be familiar with the normal appearance of her breasts. Describe observations or findings in relation to imaginary lines that divide the breast into four quadrants and a tail. The lines cross at the centre of the nipple. Each tail extends outward from the upper outer quadrant (Figure 31-57).

Inspect the breasts for size and symmetry. Normally, the breasts extend from the third to the sixth ribs, with the nipple at the level of the fourth intercostal space. It is common for one breast to be smaller. However, inflammation or a mass causes

a difference in size. As the woman becomes older, the ligaments supporting the breast tissue weaken, causing the breasts to sag and the nipples to lower.

Observe the contour or shape of the breasts, and note masses, flattening, retraction, or dimpling. Breasts vary in shape and can be convex, pendulous, or conical. Retraction or dimpling results from invasion of underlying ligaments by tumours. The ligaments fibrose and pull the overlying skin inward toward the tumour. Edema also changes the contour of the breasts. To bring out retraction or changes in the shape of breasts, ask the patient to assume three positions: raise arms above the head, press hands against the hips, and extend arms

► **TABLE 31-26** Nursing History for Breast Assessment

Assessment Category	Rationale
Determine if woman is over age 50; has a personal or family history of breast or ovarian cancer, early-onset menarche (before age 13), or late-age menopause (after age 52); never had children or gave birth to first child after age 30; or has used of oral contraceptives.	These are risk factors for breast cancer (Canadian Cancer Society [CCS], 2012a).
Ask if patient (both sexes) has noticed lump, thickening, pain, or tenderness of breast; discharge, distortion, retraction, or scaling of the nipple; or change in size of breast.	Potential signs and symptoms of breast cancer allow nurse to focus on specific areas of breast during assessment.
Determine patient's use of medications (oral contraceptives, digitalis, diuretics, steroids, or estrogen). Determine patient's caffeine intake.	Some medications cause nipple discharge. Hormones and caffeine cause fibrocystic changes in breast.
Determine patient's level of activity, alcoholic intake, and weight.	Breast cancer incidence rates correlate with being overweight or obese (postmenopausal), physical inactivity, use of oral contraceptives, and consumption of one or more alcoholic beverages per day (CCS, 2012a).
Ask if patient performs breast self-examination (BSE). If so, determine time of month she performs examination in relation to menstrual cycle. Have patient describe or demonstrate method used.	Nurse's role is to educate patient about breast cancer and techniques for BSE.
If patient reports a breast mass, ask about length of time since patient first noticed the lump. Does lump come and go, or is it always present? Have there been changes in the lump (e.g., size, relationship to menses), and are there associated symptoms?	Helps to determine nature of mass, (e.g., breast cancer versus fibrocystic disease).

straight ahead while sitting and leaning forward. Each manoeuvre causes a contraction of the pectoral muscles, which will accentuate the presence of any retraction.

Carefully inspect the skin for colour; venous pattern; and the presence of lesions, edema, or inflammation. Lift each breast when necessary to observe lower and lateral aspects for colour and texture changes. The breasts are the colour of neighbouring skin, and venous patterns are the same bilaterally. Venous patterns are easily visible in thin or pregnant

► **BOX 31-23** Normal Changes in the Breast During a Woman's Lifespan

Puberty (8 to 20 Years)

Tanner staging (1–5) is a method of assessment for sexual maturity of adolescents (Jarvis et al., 2009; Tanner, 1962). Breasts mature in five stages. One breast may grow more rapidly than the other. The ages at which changes occur and rate of developmental progression vary.

Stage 1 (Preadolescent)

This stage involves elevation of the nipple only.

Stage 2

The breast and nipple elevate as a small mound, and the areolar diameters enlarge.

Stage 3

There is further enlargement and elevation of the breast and areola, with no separation of contour.

Stage 4

The areola and nipple project into the secondary mound above the level of the breast (does not occur in all girls).

Stage 5 (Mature Breast)

Only the nipple projects, and the areola recedes (varies in some women).

Young Adulthood (20 to 30 Years)

Breasts reach full (nonpregnant) size. Shape is generally symmetrical. Breasts are sometimes unequal in size.

Pregnancy

Breast size gradually enlarges to two to three times the previous size. Nipples enlarge and become erect. Areolae darken, and diameters increase. Superficial veins become prominent. The nipples expel a yellowish fluid (colostrum).

Menopause

Breasts shrink. Tissue becomes softer, sometimes flabby.

Older Adulthood

Breasts become elongated, pendulous, and flaccid as a result of glandular tissue atrophy. The skin of the breasts tends to wrinkle, appearing loose and flabby.

Nipples become smaller and flatter and lose erectile ability. Nipples sometimes invert because of shrinkage and fibrotic changes.

Data from Hockenberry, M. J., & Wilson, P. (Eds.). (2007). *Wong's nursing care of infants and children* (8th ed.). St Louis, MO: Mosby; Seidel, H. M., Ball, J. W., Dains, J. E., Flynn, J. A., Solomon, B. S., & Stewart, R. W. (2011). *Mosby's guide to physical examination* (7th ed.). St Louis, MO: Mosby; and Ebersole, P., Touhy, T., Hess, P., Jett, K., & Schmidt, A. (2007). *Towards healthy aging: Human needs and nursing response* (7th ed.). Philadelphia, PA: Elsevier.

women. Women with large breasts often have redness and excoriation of the undersurfaces caused by rubbing of skin surfaces.

Inspect the nipple and areola for size, colour, shape, discharge, and the direction the nipples point. The normal areolae are round or oval and nearly equal bilaterally. Colour ranges from pink to brown. In light-skinned women, the areola turns brown during pregnancy and remains dark. In dark-skinned women, the areola is brown before pregnancy (Seidel et al.,

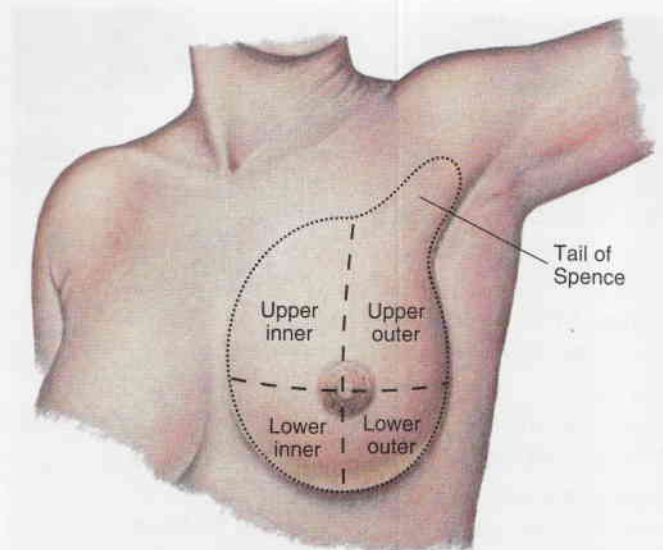


Figure 31-57 Quadrants of the left breast and axillary tail of Spence.
Source: From Seidel, H. M., et al. (2011). *Mosby's guide to physical examination* (7th ed., p. 457). St Louis, MO: Mosby.

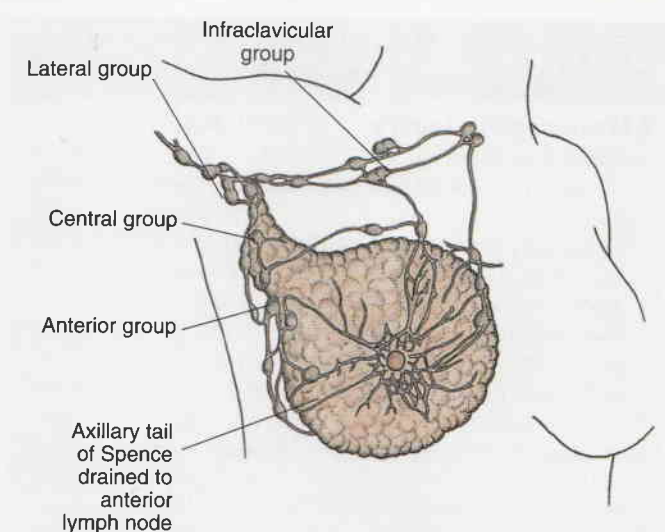


Figure 31-58 Anatomical position of axillary and clavicular lymph nodes.

2011). Normally, the nipples point in symmetrical directions, are everted, and have no drainage. If the nipples are inverted, ask if this has been a lifetime history. A recent inversion or inward turning of the nipple indicates an underlying growth. Rashes or ulcerations are not normal on the breast or nipples. Note any bleeding or discharge from the nipple. Clear yellow discharge two days after childbirth is common. While inspecting the breasts, explain the characteristics you see. Teach the patient the significance of abnormal signs or symptoms.

Palpation. Palpation assesses the condition of underlying breast tissue and lymph nodes. Breast tissue consists of glandular tissue, fibrous supportive ligaments, and fat. Glandular tissue is organized into lobes that end in ducts that open onto the nipple's surface. The largest portion of glandular tissue is in the upper outer quadrant and tail of each breast. Suspensory ligaments connect to skin and fascia underlying the breast to support the breast and maintain its upright position. Fatty tissue is located superficially and to the sides of the breast.

A large portion of lymph from the breasts drains into axillary lymph nodes. If cancerous lesions **metastasize** (spread), the nodes commonly become involved. Study the location of supraclavicular, infraclavicular, and axillary nodes (Figure 31-58). The axillary nodes drain lymph from the chest wall, breasts, arms, and hands. A tumour of one breast sometimes involves nodes on the opposite side, as well as those on the same side.

To palpate the lymph nodes, have the patient sit with her arms at her sides and muscles relaxed. While facing the patient and standing on the side you are examining, support the patient's arm in a flexed position and abduct the arm from the chest wall. Place the free hand against the patient's chest wall and high in the axillary hollow. With the fingertips, press gently down over the surface of the ribs and muscles. Palpate the axillary nodes with the fingertips gently rolling soft tissue (Figure 31-59). Palpate four areas of the axilla: at the edge of the pectoralis major muscle along the anterior axillary line, the chest wall in the midaxillary area, the upper part of the



Figure 31-59 Support the patient's arm, and palpate axillary lymph nodes.

humerus, and the anterior edge of the latissimus dorsi muscle along the posterior axillary line.

Normally lymph nodes are not palpable. Carefully assess each area, and note their number, consistency, mobility, and size. One or two small, soft, nontender palpable nodes are normal. A palpable node feels like a small mass that is hard, tender, and immobile. Also palpate along the upper and lower clavicular ridges. Reverse the procedure for the patient's other side.

It is sometimes difficult for the patient to learn to palpate for lymph nodes. Lying down with the arm abducted makes the area more accessible. Instruct the patient to use her left hand for the right axillary and clavicular areas. Take the patient's fingertips and move them in the proper fashion. Then have the patient use her right hand to palpate for nodes on the left side.

With the patient lying supine and one arm behind the head (alternating with each breast), palpate the patient's breast tissue. The supine position allows the breast tissue to flatten evenly against the chest wall. The patient raises her hand and places it behind the neck to further stretch and position breast

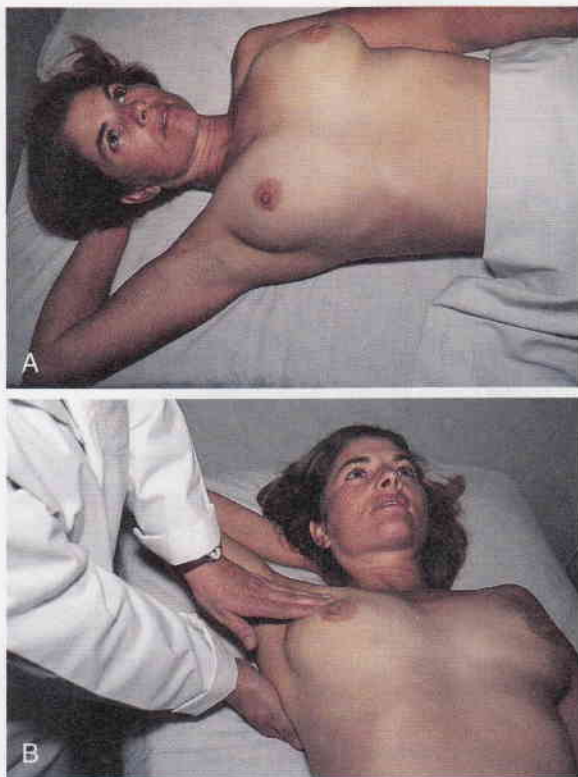


Figure 31-60 A, The patient lies flat with arm abducted and hand under head to help flatten breast tissue evenly over the chest wall. B, Each breast is palpated in a systematic fashion.

tissue evenly (Figure 31-60, A). Place a small pillow or towel under the patient's shoulder blade to further position breast tissue.

The consistency of normal breast tissue varies widely. The breasts of a young patient are firm and elastic. In an older patient, the tissue sometimes feels stringy and nodular. The patient's familiarity with the texture of her own breasts is very important. Patients gain familiarity through BSE (Box 31-24).

If the patient complains of a mass, examine the opposite breast to ensure an objective comparison of normal and abnormal tissue. Use the pads of the first three fingers to compress breast tissue gently against the chest wall, noting tissue consistency (Figure 31-61, B). Perform palpation systematically in one of three ways: (1) clockwise or counterclockwise, forming small circles with the fingers along each quadrant and the tail; (2) using a vertical technique with the fingers moving up and down each quadrant; or (3) palpating from the centre of the breast in a radial fashion, returning to the areola to begin each spoke (see Figure 31-61, C). Whatever approach you use, be sure to cover the entire breast and tail, directing attention to any areas of tenderness.

When palpating large, pendulous breasts, use a bimanual technique. Support the inferior portion of the breast in one hand while using the other hand to palpate breast tissue against the supporting hand.

During palpation, note the consistency of breast tissue. It normally feels dense, firm, and elastic. With menopause, breast tissue shrinks and becomes softer. The lobular feel of glandular tissue is normal. The lower edge of each breast sometimes feels firm and hard. This is the normal inframammary ridge

BOX 31-24 PATIENT TEACHING

Female Breast Assessment

Objectives

- Patient will perform breast self-examination (BSE) (see Box 31-22, p. 604).
- Patient will have screening mammography performed at recommended intervals, beginning at age 50.
- Patient will identify signs and symptoms of breast cancer.
- Patient will identify signs and symptoms of benign (fibrocystic) breast disease.
- Patient will follow a low-fat diet.

Teaching Strategies

- Have patient perform return demonstration of BSE, and offer the opportunity to ask questions.
- Explain recommended frequency of mammography and assessment by a health care provider.
- Discuss signs and symptoms of breast cancer.
- Discuss signs and symptoms of benign (fibrocystic) breast disease.
- Inform a woman who is obese or who has a family history of breast cancer that she is at higher risk for the disease (Canadian Cancer Society, 2012a). Encourage dietary changes, including limiting meat consumption to well-trimmed, lean beef, pork, or lamb; removing skin from cooked chicken before eating it; selecting tuna and salmon packed in water and not oil; and using low-fat dairy products.
- Encourage patient to reduce intake of caffeine and theophyllines. Although this approach is controversial, it will possibly reduce symptoms of benign (fibrocystic) breast disease.

Evaluation

- Have patient demonstrate BSE.
- During follow-up visit, determine whether patient has had mammography performed.
- Ask patient to explain frequency of mammography.
- Have patient describe signs and symptoms of breast cancer compared with benign (fibrocystic) breast disease.

and not a tumour. It helps to move the patient's hand so that she can feel normal tissue variations. Palpate abnormal masses to determine location in relation to quadrants, diameter in centimetres, shape (e.g., round or discoid), consistency (soft, firm, or hard), tenderness, mobility, and discreteness (clear or unclear boundaries).

Cancerous lesions are hard, fixed, nontender, irregular in shape, and usually unilateral. A common benign condition of the breast is **benign (fibrocystic) breast disease**. Bilateral lumpy, painful breasts and sometimes nipple discharge characterize this condition. Symptoms are more apparent during the menstrual period. When palpated, the cysts (lumps) are soft, well differentiated, and movable. Deep cysts feel hard.

Give special attention when palpating the nipple and areola. Palpate the entire surface gently. Use the thumb and index finger to compress the nipple, and note any discharge. During the examination of the nipple and areola, the nipple sometimes becomes erect with wrinkling of the areola. These changes are normal.

After completing the examination, have the patient demonstrate self-palpation. Observe the patient's technique, and emphasize the importance of a consistent and systematic

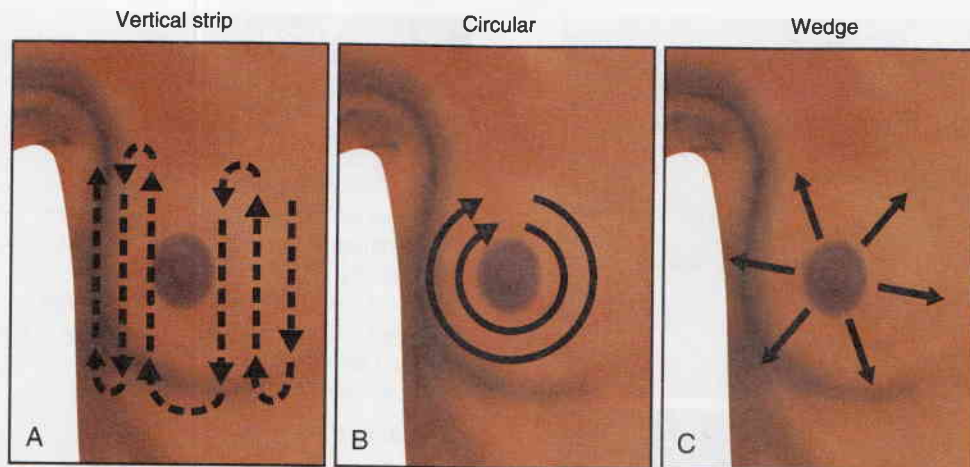


Figure 31-61 Various methods for palpation of the breast. **A**, Palpate from top to bottom in vertical strips. **B**, Palpate in concentric circles. **C**, Palpate out from the centre in wedge sections. **Source:** From Seidel, H. M., et al. (2011). *Mosby's guide to physical examination* (7th ed., p. 471). St Louis, MO: Mosby.

approach. Urge the patient to see her health care provider if she discovers an abnormal mass during self-examination. She also needs to know all of the signs and symptoms of breast cancer.

Male Breasts

Examination of the male breast is relatively easy. Inspect the nipple and areola for nodules, edema, and ulceration. An enlarged male breast results from obesity or glandular enlargement. Breast enlargement in young males results from steroid use. Fatty tissue feels soft, whereas glandular tissue is firm. Use the same techniques to palpate for masses used in examination of the female breast.

safety alert Men, especially men who have a first-degree relative (e.g., mother, sister) with breast cancer, are at risk for breast cancer and need to palpate their breasts at regular intervals. In discussion with their health care provider, these men may also be scheduled for routine mammograms.

Abdomen

The abdominal examination is complex because of the number of organs located within and near the abdominal cavity. A thorough nursing history (Table 31-27) helps interpret physical signs. The examination includes an assessment of structures of the lower GI tract in addition to the liver, stomach, uterus, ovaries, kidneys, and bladder. Abdominal pain is one of the most common symptoms that patients report when seeking medical care. An accurate assessment requires matching patient history data with a careful assessment of the location of physical symptoms.

Assess the organs anteriorly and posteriorly. A system of landmarks help map out the abdominal region. The xiphoid process (tip of the sternum) is the upper boundary of the anterior abdominal region. The symphysis pubis marks the lower boundary. Divide the abdomen into four imaginary quadrants (Figure 31-62, A), and refer to assessment findings and record them in relation to each quadrant. Posteriorly, the lower ribs and heavy back muscles protect the kidneys, which are located from the T12 to L3 vertebrae (Figure 31-62,

B). The costovertebral angle formed by the last rib and vertebral column is a landmark used during kidney and liver palpation.

During the abdominal examination, the patient needs to relax. A tightening of abdominal muscles hinders palpation. Ask the patient to void before beginning. Be sure the room is warm, and drape upper chest and legs. The patient lies supine or in a dorsal recumbent position with the arms at the sides and knees slightly bent. Place small pillows beneath the knees. If the patient places the arms under the head, the abdominal muscles tighten. Proceed calmly and slowly, being sure that there is adequate lighting. Expose the abdomen from just above the xiphoid process down to the symphysis pubis. Warm hands and stethoscope further promote relaxation. Ask the patient to report pain and point out tender areas. Assess tender areas last.

The order of an abdominal examination differs slightly from previous assessments. Begin with inspection and follow with auscultation. By using auscultation before palpation there is less chance of altering the frequency and character of bowel sounds. Be sure to have a tape measure and marking pen available during the examination.

Inspection

Make it a habit to observe the patient during routine care activities. Note the patient's posture and look for evidence of abdominal splinting: lying with the knees drawn up or moving restlessly in bed. A patient free from abdominal pain will not guard or splint the abdomen. To inspect the abdomen for abnormal movement or shadows, stand on the patient's right side and inspect from above the abdomen. By sitting down to look across the abdomen, assess abdominal contour. Direct the examination light over the abdomen.

Skin. Inspect the skin over the abdomen for colour, scars, venous patterns, lesions, and striae (stretch marks). The skin is subject to the same colour variations as the rest of the body. Venous patterns are normally faint, except in thin patients. Striae result from stretching of tissue by obesity or pregnancy. Artificial openings indicate drainage sites resulting from surgery (see Chapter 48) or an ostomy (see Chapters 43 and 44). Scars reveal evidence of past trauma or surgery that has

► TABLE 31-27 Nursing History for Abdominal Assessment

Assessment Category

If patient has abdominal or low back pain, assess character of pain in detail (location, onset, frequency, precipitating factors, aggravating factors, type of pain, severity, course).

Carefully observe patient's movement and position, including lying still with knees drawn up, moving restlessly to find comfortable position, and lying on one side or sitting with knees drawn to chest.

Assess normal bowel habits and stool character; ask if patient uses laxatives.

Determine if patient has had abdominal surgery, trauma, or diagnostic tests of gastrointestinal (GI) tract.

Assess if patient has had recent weight changes or intolerance to diet (e.g., nausea, vomiting, cramping, especially in last 24 hours).

Assess for difficulty in swallowing, belching, flatulence (gas), bloody emesis (hematemesis), black or tarry stools (melena), heartburn, diarrhea, or constipation.

Ask if patient takes anti-inflammatory medication (e.g., aspirin, ibuprofen, steroids) or antibiotics.

Ask patient to locate tender areas before examination begins.

Inquire about family history of cancer, kidney disease, alcoholism, hypertension, or heart disease.

Determine if female patient is pregnant; note last menstrual period.

Assess patient's usual intake of alcohol.

Review patient's history for the following: health care occupation, hemodialysis, intravenous drug user, household or sexual contact with hepatitis B virus (HBV) carrier, heterosexual person with more than one sex partner in previous 6 months, sexually active homosexual or bisexual male, international traveller in area of high HBV infection rate.

Rationale

Pattern of characteristics of pain helps determine its source.

Positions assumed by patient reveals nature and source of pain, including peritonitis, renal stone, and pancreatitis.

Data compared with physical findings help identify cause and nature of elimination problems.

Surgical or traumatic alterations of abdominal organs cause changes in expected findings (e.g., position of underlying organs). Diagnostic tests change character of stool.

Data possibly indicate alterations in upper GI tract (stomach or gallbladder) or lower colon.

These characteristic signs and symptoms indicate gastrointestinal alterations.

Pharmacological agents cause GI upset or bleeding.

Assess painful areas last to minimize discomfort and anxiety.

Data possibly reveal risk for alterations identifiable during examination.

Pregnancy causes changes in abdominal shape and contour.

Chronic alcohol ingestion causes gastrointestinal and liver problems.

Risk factors for HBV exposure.

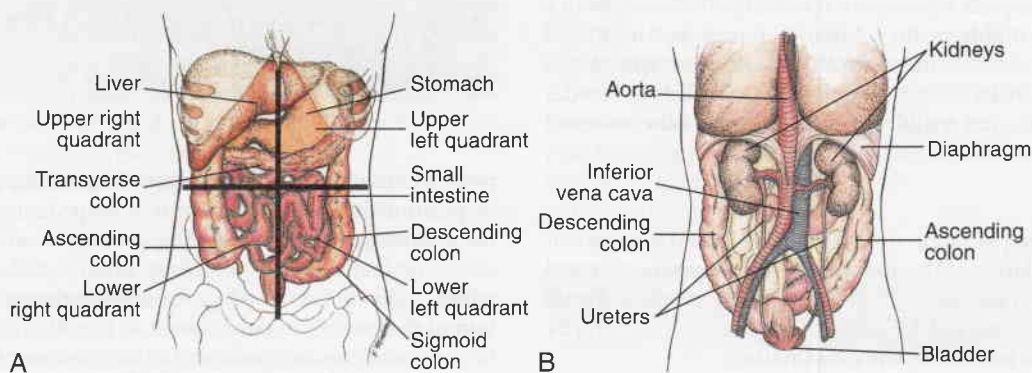


Figure 31-62 A, Anterior view of abdomen divided by quadrants. B, Posterior view of abdominal section.

created permanent changes in underlying organ anatomy. Bruising indicates accidental injury, physical abuse, or a type of bleeding disorder. Ask if the patient self-administers injections (e.g., low-molecular-weight heparin or insulin). Unexpected findings include generalized colour changes such as jaundice or cyanosis. A glistening, taut (tight) appearance indicates ascites.

Umbilicus. Note the position; shape; colour; and signs of inflammation, discharge, or protruding masses. A normal umbilicus is flat or concave with the colour the same as that of the surrounding skin. Underlying masses cause displacement of the umbilicus. An everted (pouched-out) umbilicus

usually indicates distension. **Hernias** (protrusion of abdominal organs through the muscle wall) cause upward protrusion of the umbilicus. Normally the umbilical area does not emit discharge.

Contour and Symmetry. Inspect for contour, symmetry, and surface motion of the abdomen, noting any masses, bulging, or distension. A flat abdomen forms a horizontal plane from the xiphoid process to the symphysis pubis. A round abdomen protrudes in a convex sphere from the horizontal plane. A concave abdomen appears to sink into the muscular wall. Each of these findings is normal if the abdomen's shape is symmetrical. In older adults, there is often an

overall increased distribution of adipose tissue. The presence of masses on only one side, or asymmetry, possibly indicates an underlying pathological condition.

Intestinal gas, a tumour, or fluid in the abdominal cavity causes distension. When distension is generalized, the entire abdomen protrudes. The skin often appears taut, as if it were stretched over the abdomen. When gas causes distension, the flanks do not bulge. However, if fluid is the source of the problem, the flanks bulge. Ask the patient to roll onto one side. A protuberance forms on the dependent side if fluid is the cause of the distension. Ask the patient if the abdomen feels unusually tight. Be careful not to confuse distension with obesity. In obesity, the abdomen is large, rolls of adipose tissue are often present along the flanks, and the patient does not complain of tightness in the abdomen. If abdominal distension is expected, measure the abdomen by placing a tape measure around the abdomen at the level of the umbilicus. Consecutive measurements will show any increase or decrease in distension. Use a marking pen to indicate the location of tape measure.

Enlarged Organs or Masses. Observe the contour of the abdomen while asking the patient to take a deep breath and hold it. Normally, the contour remains smooth and symmetrical. This manoeuvre forces the diaphragm downward and reduces the size of the abdominal cavity. Any enlarged organs in the upper abdominal cavity (e.g., liver or spleen) will descend below the rib cage to cause a bulge. Perform a closer examination with palpation.

To evaluate the abdominal musculature, have the patient raise his or her head off the examination table. This position causes superficial abdominal wall masses, hernias, and muscle separations to become more apparent.

Movement or Pulsations. Inspect for movement. Normally, men breathe abdominally and women breathe more costally. A patient with severe pain has diminished respiratory movement and tightens the abdominal muscles to guard against the pain. Closely inspect for peristaltic movement and aortic pulsation by looking across the abdomen from the side. These movements are visible in thin patients; otherwise no movement is present.

Auscultation

Auscultate before palpation during the abdominal assessment because manipulation of the abdomen alters the frequency and intensity of bowel sounds. Ask the patient not to talk. Patients with GI tubes connected to suction need them temporarily turned off before beginning the examination.

Bowel Motility. Peristalsis, or the movement of contents through the intestines, is a normal function of the small and large intestine. Bowel sounds are the audible passage of air and fluid that peristalsis creates. Place the warmed diaphragm of the stethoscope lightly over each of the four quadrants. Normally, air and fluid move through the intestines, creating soft gurgling or clicking sounds that occur irregularly 5 to 35 times per minute (Seidel et al., 2011). Sounds usually last from half a second to several seconds. It normally takes 5 to 20 seconds to hear a bowel sound. However, it takes 5 minutes of continuous listening before determining that bowel sounds are absent (Seidel et al., 2011). Auscultate all four quadrants to be sure that you do not miss any sounds. The best time to auscultate is between meals. Sounds are generally described as normal, audible, absent, hyperactive, or hypoactive. Absent sounds indicate a lack of peristalsis,

* BOX 31-25 PATIENT TEACHING

Abdominal Assessment

Objectives

- Patient will maintain normal bowel elimination.
- Patient will achieve pain relief.
- Patients at high risk for **hepatitis B virus (HBV)** will receive immunization.
- Patient will identify signs and symptoms of colon cancer.

Teaching Strategies

- Explain factors that promote normal bowel elimination, such as diet, regular exercise, limited use of over-the-counter drugs causing constipation, establishment of regular elimination schedule, and a good fluid intake (see Chapter 44). Stress importance for older adults.
- Caution patients about dangers of excessive use of laxatives or enemas.
- Instruct patient to have acute abdominal pain evaluated by a health care provider.
- If patient has chronic pain, explain measures used for pain relief (e.g., relaxation exercises, positioning) (see Chapter 41).
- If patient is a health care worker or has contact with blood or fluids of affected person, encourage patient to receive the series of three HBV vaccine doses.
- Instruct patient about warning signs of colon cancer, including rectal bleeding, cramping pain in lower abdomen, black or tarry stools, blood in stool, and a change in bowel habits (constipation or diarrhea).

Evaluation

- Reassess patient's bowel elimination pattern and stool character after therapies begin.
- Observe patient using pain-relief measures and reassess character of pain.
- During follow-up clinic or office visit, check patient's compliance with HBV vaccine schedule.
- Ask patient to state signs and symptoms of colon cancer.



possibly due to late-stage bowel obstruction, **paralytic ileus**, or **peritonitis**. Normally, absent or hypoactive bowel sounds occur postoperatively following general anesthesia. Hyperactive sounds are loud, "growling" sounds called **borborygmi**, which indicate increased gastrointestinal motility. Inflammation of the bowel, anxiety, diarrhea, bleeding, excessive ingestion of laxatives, and reaction of the intestines to certain foods cause increased motility (Box 31-25).

Vascular Sounds. Bruits indicate narrowing of the major blood vessels and disruption of blood flow. The presence of bruits in the abdominal area will possibly reveal aneurysms or stenotic vessels. Use the bell of the stethoscope to auscultate in the epigastric region and each of the four quadrants. Normally there are no vascular sounds over the aorta (midline through the abdomen) or femoral arteries (lower quadrants). Renal artery bruits are heard by placing the stethoscope over each upper quadrant anteriorly or over the costovertebral angle posteriorly. Report a bruit immediately to a health care provider.

Kidney Tenderness. With the patient sitting or standing erect, use direct or indirect percussion to assess for kidney inflammation. With the ulnar surface of the partially closed fist, percuss posteriorly the costovertebral angle at the scapular



Figure 31-63 Light palpation of abdomen.



Figure 31-64 Deep palpation of abdomen.

line. If the kidneys are inflamed, the patient feels tenderness during percussion.

Palpation

Palpation primarily detects areas of abdominal tenderness, distension, or masses. As skill base increases, learn to palpate for specific organs. Use light and deep palpation.

Use light palpation over each abdominal quadrant. Initially avoid areas previously identified as problem spots. Lay the palm of the hand with fingers extended and approximated lightly on the abdomen. Explain the manoeuvre to the patient, and then with the palmar surface of the fingers depress approximately 1.3 cm in a gentle dipping motion (Figure 31-63). Avoid quick jabs, and use smooth, coordinated movements. For ticklish patients, first place the patient's hand on the abdomen with your hand on the patient's; continue this until the patient tolerates palpation.

Use a systematic palpation approach for each quadrant and assess for muscular resistance, distension, tenderness, and superficial organs or masses. Observe the patient's face for signs of discomfort. The abdomen is normally smooth with consistent softness and nontender without masses. The older adult often lacks abdominal tone. Guarding or muscle tenseness sometimes occurs while palpating a sensitive area. If tightening remains after the patient relaxes, peritonitis, acute **cholecystitis**, or appendicitis is sometimes the cause. It is easy to detect a distended bladder with light palpation. Normally the bladder lies below the umbilicus and above the symphysis pubis. Routinely check for a distended bladder if a patient has been unable to void (e.g., because of anesthesia or sedation) or has been incontinent, or if an indwelling urinary catheter is not draining well.

With practice and experience, perform deep palpation to delineate abdominal organs and to detect less obvious masses. You will need short fingernails. It is important for the patient to be relaxed while the hands depress approximately 2.5 to 7.5 cm into the abdomen (Figure 31-64). Never use deep palpation over a surgical incision or over extremely tender organs. It is also unwise to use palpation on abnormal masses. Deep pressure causes tenderness in the healthy patient over the

cecum, sigmoid colon, aorta, and the midline near the xiphoid process (Seidel et al., 2011).

Survey each quadrant systematically. Palpate masses for size, location, shape, consistency, tenderness, pulsation, and mobility. Test for rebound tenderness by pressing a hand slowly and deeply into the involved area and then letting go quickly. The test is positive if the patient feels pain with the release of the hand. Rebound tenderness occurs in patients with peritoneal irritation such as occurs in appendicitis; **pancreatitis**; or any peritoneal injury causing bile, blood, or enzymes to enter the peritoneal cavity.

Aortic Pulsation. To assess aortic pulsation, palpate with the thumb and forefinger of one hand deeply into the upper abdomen, just left of the midline. Normally a pulsation is transmitted forward. If there is enlargement of the aorta from an **aneurysm** (localized dilation of a vessel wall), the pulsation expands laterally. Do not palpate a pulsating abdominal mass. In obese patients it is often necessary to palpate with both hands, one on each side of the aorta.

safety alert When enlargement from an aneurysm is present, only lightly palpate this area. In addition, only someone with advanced education and experience should perform palpation of this area.

Female Genitalia and Reproductive Tract

Examination of the female genitalia is embarrassing to the patient unless you use a calm, relaxed approach. The gynecological examination is one of the most difficult experiences for adolescents. Cultural background further adds to apprehension. In some cultures, a strong social value may exist where women do not expose their bodies to men or even to other women. In other cultures, the examination of genitalia may be considered offensive. Cultural expression of these values, and the level of emotional or physical comfort with the procedure, needs to be explored prior to any genital exam. The lithotomy position assumed during the examination is an added source of embarrassment. It is often the nurse's role to provide a thorough explanation as to the reason for the examination and

the procedures that will be used. Patient acceptance and comfort can be augmented through correct positioning and draping. Adolescents sometimes choose to have parents present in the examination room.

Sometimes a patient requires a complete examination of the female reproductive organs: assessment of the external genitalia and a vaginal examination. The nurse will examine external genitalia while performing routine hygiene measures or preparing to insert a urinary catheter. An internal examination is part of each woman's preventive health care because ovarian cancer causes more deaths than any other cancer of the female reproductive system (CCS Steering Committee, 2010).

Adolescents and young adults are examined because of the growing incidence of sexually transmitted infections (STIs). The average age of menarche among young girls has declined, and the majority of male and female teenagers are sexually active by age 19 (Hockenberry & Wilson, 2007). It is important to assess the patient's level of anxiety as you obtain the nursing history (Table 31-28). Rectal and anal assessment are combined with this examination because the patient assumes a lithotomy or dorsal recumbent position.

Preparation of the Patient

As a beginning nurse, your responsibility will be assisting the patient's health care provider with the examination. For a complete examination, you will need the following special equipment: examination table with stirrups, vaginal speculum of correct size, adjustable light source, sink, clean disposable gloves, sterile cotton swabs, glass slides, plastic or wooden spatula, cervical brush or broom device, cytologic fixative, and culture plates or media (Seidel et al., 2011).

Make sure the equipment is ready before the examination begins. Ask the patient to empty her bladder so that the uterus and ovaries are readily palpable. Often it is necessary to collect a urine specimen. Assist the patient to the lithotomy position, in bed or on an examination table for the external genitalia assessment. Assist the patient into stirrups for a speculum examination. Have the woman stabilize each foot in a stirrup and then have her slide the buttocks down to the edge of the examining table. Place a hand at the edge of the table and instruct the patient to move until touching the hand. The patient's arms should be at her sides or folded across the chest to prevent tightening of abdominal muscles.

► **TABLE 31-28** Nursing History for Female Genitalia and Reproductive Tract Assessment

Assessment Category

Determine if patient has had previous illness or surgery involving reproductive organs, including sexually transmitted infections (STIs).
Determine if patient has received a human papillomavirus (HPV) vaccine.

Review menstrual history, including age at menarche, frequency and duration of menstrual cycle, character of flow (e.g., amount, presence of clots), presence of dysmenorrhea (painful menstruation), pelvic pain, dates of last two menstrual periods, and premenstrual symptoms.

Ask patient to describe obstetrical history, including each pregnancy and history of abortions or miscarriages.

Ask patient to describe current and past contraceptive practices and problems encountered. Determine whether patient uses safe sex practices. Discuss risk of STIs and HIV infection.

Sexual history reveals risk for and understanding of STIs.

Assess if patient has signs and symptoms of vaginal discharge, painful or swollen perianal tissues, or genital lesions.

Determine if patient has symptoms or history of genitourinary problems, including burning during urination, frequency, urgency, nocturia, hematuria, incontinence, or stress incontinence (see Chapter 43).

Ask if patient has had signs of bleeding outside of normal menstrual period or after menopause or has had unusual vaginal discharge.

Determine if patient has history of HPV (condyloma acuminatum, herpes simplex, or cervical dysplasia); has multiple sex partners; smokes cigarettes; has had multiple pregnancies; or was young at first intercourse.

Determine if patient is older than 40, is obese, and has history of ovarian dysfunction, breast or endometrial cancer, irradiation of pelvic organs, or endometriosis; has family history of ovarian, breast, or colon cancer; has history of infertility or nulliparity; or uses estrogen (alone) hormone replacement therapy.

Determine if patient is postmenopausal, obese, or infertile; had early menarche; had late menopause; has history of hypertension, diabetes, gallbladder disease, or polycystic ovary disease; has family history of endometrial, breast, or colon cancer; or has a history of estrogen-related exposure (estrogen replacement therapy, tamoxifen use).

Rationale

Illness or surgery influences appearance and position of organs being examined.

HPV vaccine is recommended for females (ages 9–26) to prevent cervical cancer (Public Health Agency of Canada, 2006). HPV increases patient's risk for development of cervical cancer. This information helps to reveal level of reproductive health, including normalcy of menstrual cycle.

Observed physical findings will vary, depending on woman's history of pregnancy.

Use of certain types of contraceptives influence reproductive health (e.g., sensitivity reaction to spermicidal jelly).

These signs and symptoms may indicate STI or other pathological condition.

Urinary problems are associated with gynecological disorders, including STIs.

These are warning signs for cervical and endometrial cancer or vaginal infection.

These are risk factors for cervical cancer. Vaccines are available for HPV for females 9–26 years of age.

These are risk factors for ovarian cancer.

These are risk factors for endometrial cancer.

Some women suffering from pain or deformity of the joints are unable to assume a lithotomy position. In this situation, it is necessary to have the patient abduct only one leg or to have another assist in separating the patient's thighs. Also, use the side-lying position with the patient on the left side with the right thigh and knee drawn up to her chest.

Give a square drape or sheet to the patient. She holds one corner over her sternum, the adjacent corners fall over each knee, and the fourth corner covers the perineum. After the examination begins, lift the drape over the perineum. The male examiner always needs to have a female attendant present during the examination. A female examiner may prefer to work alone but should have a female attendant if the patient is particularly anxious or emotionally unstable.

External Genitalia

Make sure the perineal area is well illuminated. Wear clean gloves on both hands to prevent contact with infectious organisms. The perineum is extremely sensitive and tender; do not touch the area suddenly without warning the patient. It is best to touch the neighbouring thigh first before advancing to the perineum.

While sitting at the end of the examination table or bed, inspect the quantity and distribution of hair growth. Preadolescents have no pubic hair. During adolescence, hair grows along the labia, becoming darker, coarser, and curlier. In an adult, hair grows in a triangle over the female perineum and along the medial surfaces of the thighs. Hair is normally free of nits and lice. The underlying skin is free of inflammation, irritation, or lesions.

An increasingly common practice among younger women is the removal of genital hair by means of waxing or shaving. Assess the genital region in these patients with respect to abrasion, ingrown hair, irritation from clothing, and signs of infection. Patients who remove the hair in their genital region should be instructed regarding increased hygiene practices (Herbenick et al., 2010).

Inspect surface characteristics of the labia majora. The skin of the perineum is smooth, clean, and slightly darker than other skin. The mucous membranes appear dark pink and moist. The labia majora are gaping or closed and appear dry or moist. They are usually symmetrical. After childbirth, the labia majora separate, causing the labia minora to become more prominent. When a woman reaches menopause, the labia majora become thinned. With advancing age, they become **atrophied** (reduced in size). The labia majora are normally without inflammation, edema, lesions, or lacerations.

To inspect the remaining external structures, use your non-dominant hand and gently place the thumb and index finger inside the labia minora and retract the tissues outwardly (Figure 31-65). Be sure to have a firm hold to avoid repeated retraction against the sensitive tissues. Use the other hand to palpate the labia minora between the thumb and second finger. On inspection, the labia minora are normally thinner than the labia majora, and one side is sometimes larger. The tissue feels soft on palpation and without tenderness. The size of the clitoris is variable, but it normally does not exceed 2 cm in length and 0.5 cm in width. Look for atrophy, inflammation, or adhesions. If inflamed, the clitoris will be a bright cherry red. In young women, it is a common site for syphilitic lesions, or **chancres**, which appear as small open ulcers that drain serous material. Some older women have malignant changes that result in dry, scaly, nodular lesions.

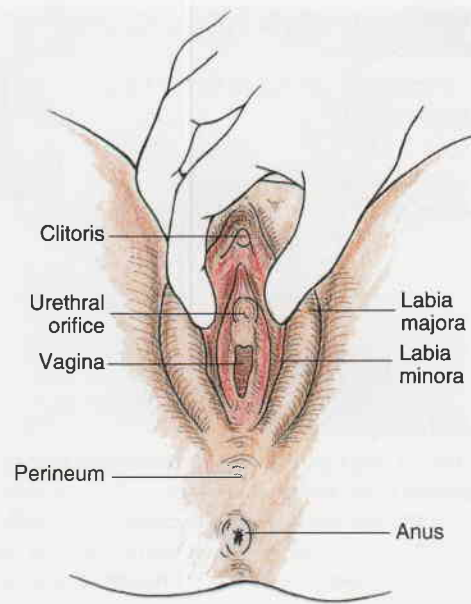


Figure 31-65 Female external genitalia.

Inspect the urethral orifice carefully for colour and position. It is normally intact without inflammation. The urethral meatus is anterior to the vaginal orifice and is pink. It appears as a small slit or pinhole opening just above the vaginal canal. Note any discharge, polyps, or fistulas.

Inspect the vaginal orifice (introitus), for inflammation, edema, discolouration, discharge, and lesions. Normally, the introitus is a thin, vertical slit or a large orifice. The tissue is moist. While inspecting the vaginal orifice, note the condition of the hymen, which is just inside the introitus. In the virgin, the hymen restricts the opening of the vagina. Only remnants of the hymen remain after sexual intercourse.

Inspect the anus, looking for lesions and hemorrhoids. After completion of the external examination, dispose of examination gloves and offer the patient perineal hygiene.

Patients who are at risk for contracting a sexually transmitted infection (STI) need to learn to perform a genital self-examination (GSE) (Box 31-26). The purpose of the examination is to detect any signs or symptoms of an STI. Many people do not know they have an STI (e.g., chlamydia), and some STIs (e.g., syphilis) remain undetected for years.

Speculum Examination of Internal Genitalia

An examination of the internal genitalia requires much skill and practice. Advanced nurse practitioners and primary care providers will perform this examination. Beginning students will more than likely only observe the procedure or assist the examiner by helping the patient with positioning, handing off specimen supplies, and comforting the patient. A detailed presentation of the internal genital exam can be found in *Physical Examination and Health Assessment*, First Canadian Edition (Jarvis et al., 2009). The examination involves use of a plastic or metal speculum, consisting of two blades and an adjustment device. The examiner inserts the speculum into the vagina to assess the internal genitalia for cancerous lesions and other abnormalities. During the examination, the examiner will collect a specimen for a Papanicolaou (Pap) test for cervical and vaginal cancer.

BOX 31-26 PATIENT TEACHING

Female Genitalia and Reproductive Tract Assessment

Objectives

- Patient will pursue routine gynecological examinations based on her level of risk for cervical cancer and other gynecological pathology.
- Patient with a sexually transmitted infection (STI) will follow safe sex practices.
- Patient will use measures to prevent acquisition and transmission of STIs.

Teaching Strategies

- Instruct patient about purpose and recommended frequency of **Papanicolaou (Pap) smears** and gynecological examinations. Explain that the Pap smear is relatively painless and needed annually with a pelvic examination for women who are sexually active or who are over the age of 21. Patients are screened more often if certain risk factors exist such as a weak immune system, multiple sex partners, smoking, and a history of infections (e.g., human papillomavirus [HPV]).
- Counsel patient with an STI about diagnosis and treatment.
- Instruct in genital self-examination (GSE): Using a mirror, position self in order to examine the area covered by the pubic hair. Spread the hair apart, looking for bumps, sores, or blisters. Also, look for any warts, which appear as small, bumpy spots and that enlarge to fleshy, cauliflower-like lesions. Next, spread the outer vaginal lips apart and look at the clitoris for bumps, blisters, sores, or warts. Also look at both sides of the inner vaginal lips. Inspect the area around the urinary and vaginal opening for bumps, blisters, sores, or warts.
- Explain warning signs of STIs: pain or burning on urination, pain during sex, pain in pelvic area, bleeding between menstruation, itchy rash around vagina, and abnormal vaginal discharge.
- Teach measures to prevent STIs: male partner's use of condoms, restricting number of sexual partners, avoiding sex with individuals who have several other partners, and perineal hygiene measures.
- Tell patients with an STI to inform sexual partners of the need for an examination and treatment.
- Reinforce the importance of performing perineal hygiene (as appropriate).

Evaluation

- Ask patient to explain when she should routinely have a gynecological examination and Pap test.
- Have patient describe ways to prevent transmission of STIs.
- For patient with an STI, determine during follow-up visit if patient has followed safe sexual practices (use nonthreatening inquiry).

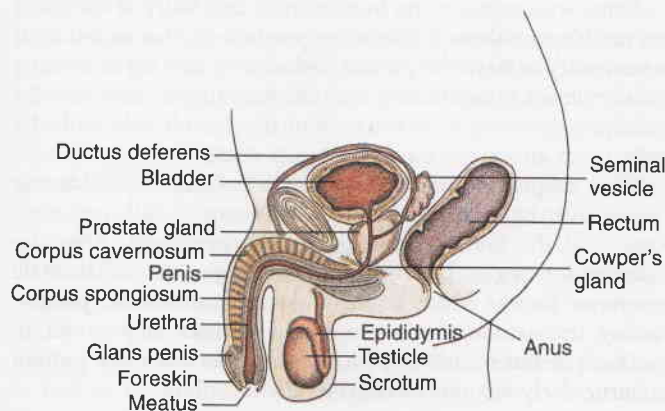


Figure 31-66 External and internal male sex organs.

BOX 31-27 PATIENT TEACHING

Male Genitalia Assessment

Objectives

- Patient will describe methods to prevent transmission of sexually transmitted infections (STIs).
- Patient will perform genital self-examination.
- Patient with an STI will follow safe sex practices.

Teaching Strategies

- Counsel patient with an STI about diagnosis and treatment.
- Explain warning signs of STIs: pain on urination and during sex, abnormal penile discharge (different from usual), swollen lymph nodes, or rash or ulcer on skin or genitalia.
- Teach measures to prevent STIs: use of condoms, avoiding sex with infected partner, restricting number of sexual partners, avoiding sex with individuals who have multiple partners, and using regular perineal hygiene.
- Tell patients with an STI to inform their sexual partners of the need to have an examination and treatment.
- Instruct patient to seek treatment as soon as possible if partner becomes infected with an STI.
- Instruct patient in how to perform genital self-examination (see Box 31-28).

Evaluation

- Ask patient to describe methods for preventing and treating STI.
- During a follow-up visit, determine whether patient with an STI has used safe sex practices.



Male Genitalia

An examination of the male genitalia assesses the integrity of the external genitalia, (Figure 31-66) inguinal ring, and canal. Because the incidence of STIs in adolescents and young adults is high, an assessment of the genitalia needs to be a routine part of any health maintenance examination for this age group (Box 31-27). The examination begins by having the patient

void. Make sure the examination room is warm. Have the patient lie supine with the chest, abdomen, and lower legs draped or stand during the examination. Wear clean gloves.

Use a calm, gentle approach to lessen the patient's anxiety. The position and exposure of the body during the examination is embarrassing for some. To minimize the patient's anxiety, it often helps to offer explanations of the steps of examination so the patient anticipates all actions. Manipulate the genitalia gently to avoid causing erection or discomfort. Obtain a thorough history (Table 31-29) before the examination, ensuring that the assessment is complete.

▶TABLE 31-29

Nursing History for Male Genitalia Assessment**Assessment Category**

Review normal urinary elimination pattern, including frequency of voiding; history of nocturia; character and volume of urine; daily fluid intake; symptoms of burning, urgency, and frequency; difficulty starting stream; and hematuria (see Chapter 43).

Assess patient's sexual history and use of safe sex habits (multiple partners, infection in partners, failure to use condom).

Determine if patient has had previous surgery or illness involving urinary or reproductive organs, including STI.

Ask if patient has noted penile pain or swelling, genital lesions, or urethral discharge.

Determine if patient has noticed heaviness or painless enlargement of testis or irregular lumps.

If patient reports an enlargement in inguinal area, assess if it is intermittent or constant, associated with straining or lifting, and painful, and whether pain is affected by coughing, lifting, or straining at stool.

Ask if patient has difficulty achieving erection or ejaculation; also review whether patient is taking diuretics, sedatives, antihypertensives, or tranquilizers.

Rationale

Urinary problems are directly associated with genitourinary problems because of anatomical structure of men's reproductive and urinary systems.

Sexual history reveals risk for and understanding of sexually transmitted infections (STIs) and human immunodeficiency virus (HIV).

Alterations resulting from disease or surgery are sometimes responsible for symptoms or changes in organ structure or function.

These signs and symptoms may indicate STI.

These signs and symptoms are early warning signs for testicular cancer.

Signs and symptoms reflect potential inguinal hernia.

These medications influence sexual performance.



Figure 31-67 Normal male genitalia (circumcised). **Source:** From Seidel, H. M., et al. (2011). *Mosby's guide to physical examination* (7th ed., p. 607). St Louis, MO: Mosby.

adult size and shape and scrotal skin darkens and becomes wrinkled. The penis has no hair, and the scrotum has very little hair (Figure 31-67). Also inspect the skin covering the genitalia for lice, rashes, excoriations, or lesions. Normally the skin is clear, without lesions.

Penis

To inspect penile surfaces thoroughly, manipulate the genitalia or have the patient assist. Inspect the shaft, corona, prepuce (foreskin), glans, and urethral meatus. The dorsal vein is apparent on inspection. In uncircumcised males, retract the foreskin to reveal the glans and urethral meatus. The foreskin usually retracts easily. A small amount of white, thick smegma sometimes collects under this foreskin. Obtain a culture if abnormal discharge is present. The urethral meatus is slitlike and is positioned on the ventral surface just millimetres from the tip of the glans. In some congenital conditions, the meatus is displaced along the penile shaft. The area between the foreskin and glans is a common site for venereal lesions. Gently compress the glans between thumb and index finger; this opens the urethral meatus for inspection of lesions, edema, and inflammation. Normally the opening is glistening and pink without discharge. Palpate any lesion gently to note tenderness, size, consistency, and shape. When inspection and palpation of the glans is complete, pull the foreskin down to its original position.

Continue by inspecting the entire shaft of the penis, including the undersurface, looking for lesions, scars, or edema. Palpate the shaft between the thumb and first two fingers to detect localized areas of hardness or tenderness. A patient who has lain in bed for a prolonged time sometimes develops dependent edema in the penis shaft.

It is important for any male patient to learn to perform a genital self-examination to detect signs or symptoms of STIs. Many people who have an STI do not know it. Self-examination is a routine part of self-care (Box 31-28).

Scrotum

Be particularly cautious while inspecting and palpating the scrotum because the structures lying within the scrotal sac are very sensitive. The scrotum is divided internally into two halves. Each half contains a testicle, epididymis, and the vas

Sexual Maturity

First, note the sexual maturity of the patient by observing the size and shape of the penis and testes; the size, colour, and texture of the scrotal skin; and the character and distribution of pubic hair. Use Tanner stages to assess and document sexual maturation (Jarvis et al., 2009). In stage 1, the penis and scrotum show no change in size and there is no evidence of pubic hair. In stage 2, the testes first increase in size during preadolescence. At this time there is little to no pubic hair. At stage 3, the scrotal hair becomes coarse and dark and the penis begins to enlarge. Further growth and coverage of the pubic area occurs in stage 4 and the glans penis matures and scrotum darkens. By the end of stage 5, the testes and penis enlarge to

► BOX 31-28 Male Genital Self-Examination

All men aged 15 years and older need to perform this examination on a regular basis using the following steps.

Genital Examination

Perform the examination after a warm bath or shower when the scrotal skin is less thick.

Stand naked in front of a mirror, and hold the penis in your hand and examine the head. Pull back the foreskin if uncircumcised to expose the glans.

Inspect and palpate the entire head of the penis in a clockwise motion, looking carefully for any bumps, sores, or blisters (bumps and blisters may be light coloured or red, resemble pimples). Look also for any genital warts (see illustration).



Male genital examination

Look at the opening (urethral meatus) at the end of the penis for discharge.

Look along the entire shaft of the penis for the same signs.

Be sure to separate pubic hair at the base of the penis and carefully examine the skin underneath.

Testicular Self-Examination

Look for swelling or lumps in the skin of the scrotum while looking in the mirror.

Use both hands, placing the index and middle fingers under the testicles and the thumb on top (see illustration).



Testicular self-examination

Gently roll the testicle, feeling for lumps, swelling, soreness, or a change in consistency (hardening).

Find the epididymis (a cordlike structure on the top and back of the testicle; it is not a lump).

Feel for small, pea-sized lumps on the front and side of the testicle. The lumps are usually painless and are abnormal.

Call your health care provider if you are uncertain whether you have detected any abnormal findings.

Photos from Seidel, H. M., Ball, J. W., Dains, J. E., Flynn, J. A., Solomon, B. S., & Stewart, R. W. (2011). *Mosby's guide to physical examination* (7th ed., p. 609). St Louis, MO: Mosby.

deferens, which travels upward into the inguinal ring. Normally the left testicle is lower than the right. Inspect the scrotum's size, shape, and symmetry while observing for lesions or edema. Gently lift the scrotum to view the posterior surface. The scrotal skin is usually loose, and the surface is coarse. The scrotal skin is more deeply pigmented than body skin. Tightening or loss or wrinkling reveal edema. The size of the scrotum normally changes with temperature variations because the dartos muscle contracts in cold and relaxes in warm temperatures. Lumps in the scrotal skin are commonly sebaceous cysts.

Testicular cancer is a solid tumour common in young men ages 18 to 34 years. Early detection is critical. Explain testicular self-examination (see Box 31-28) while examining the patient. The testes are normally sensitive but not tender. The underlying testicles are normally ovoid and approximately 2 to 4 cm in size. Gently palpate the testicles and epididymis between the thumb and first two fingers. The testes feel smooth, rubbery, and free of nodules. The epididymis is resilient. Note the size, shape, and consistency of the organs. The most common symptoms of testicular cancer are a painless enlargement of one testis and the appearance of a palpable, small, hard lump,

about the size of a pea, on the front or side of the testicle. In the older adult, the testicles decrease in size and are less firm during palpation. Continue to palpate the vas deferens separately as it forms the spermatic cord toward the inguinal ring, noting nodules or swelling. It normally feels smooth and discrete.

Inguinal Ring and Canal

The external inguinal ring provides the opening for the spermatic cord to pass into the inguinal canal. The canal forms a passage through the abdominal wall, a potential site for hernia formation. A hernia is a protrusion of a portion of intestine through the inguinal wall or canal. Sometimes an intestinal loop enters the scrotum. Have the patient stand during this portion of the examination.

During inspection, ask the patient to strain or bear down. The manoeuvre will help to make a hernia more visible. Look for obvious bulging in the inguinal area.

Complete the examination by palpating for inguinal lymph nodes. Normally, small, nontender, mobile horizontal nodes are palpable. Any abnormality indicates local or systemic infection or malignant disease.

Rectum and Anus

The rectal examination is usually performed after the genital examination. It is not commonly performed during the examination in young children or adolescents. The examination detects colorectal cancer in its early stages. In men, the rectal examination also detects prostatic tumours. Collect a thorough history (Table 31-30) to detect the patient's risk for bowel or rectal disease or prostatic disease. An examination of the rectum and anus requires much skill and practice. Advanced nurse practitioners and primary care providers will perform

► TABLE 31-30

Nursing History for Rectal and Anal Assessment

Assessment Category	Rationale
Determine whether patient has experienced bleeding from rectum, black or tarry stools (melena), rectal pain, or change in bowel habits (constipation or diarrhea).	These are warning signs of colorectal cancer* or other gastrointestinal alterations.
Determine whether patient has personal or strong family history of colorectal cancer, polyps, or chronic inflammatory bowel disease. Ask if patient is over age 40.	These are risk factors for colorectal cancer.*
Assess dietary habits, including high fat intake, diet high in processed or red meats, or deficient fibre content (inadequate fruits and vegetables).	Bowel cancer is often linked to dietary intake of fat or insufficient fibre intake.*
Determine if patient is obese, is physically inactive, smokes, or consumes alcohol.	Risk factors for colorectal cancer.
Determine whether patient has undergone screening for colorectal cancer (digital examination, fecal occult blood test, flexible sigmoidoscopy, and colonoscopy).	Undergoing this screening reflects understanding and compliance with preventive health care measures.
Assess medication history for use of laxatives or cathartic medications.	Repeated use causes diarrhea and eventual loss of intestinal muscle tone.
Assess for use of codeine or iron preparations.	Codeine causes constipation. Iron turns the color of feces black and tarry.
Ask male patient if he has experienced weak or interrupted urine flow, inability to urinate, difficulty in starting or stopping urine flow, polyuria, nocturia, hematuria, or dysuria. Does patient have continuing pain in lower back, pelvis, or upper thighs?	These are warning signs of prostatic cancer.* Symptoms also suggest infection or prostate enlargement.

*Data from Canadian Cancer Society. (2012). *What is colorectal cancer*. Toronto: Author. Retrieved from <http://www.cancer.ca/Canada-wide/About%20cancer/Types%20of%20cancer/What%20is%20colorectal%20cancer.aspx>.

this examination. Beginning students will more than likely only observe the procedure or assist the examiner by helping the patient with positioning, handing off specimen supplies, and comforting the patient. A detailed presentation of the rectum and anus exam can be found in *Physical Examination and Health Assessment*, First Canadian Edition (Jarvis et al., 2009).

The rectal examination is uncomfortable, so explaining all steps helps the patient relax. Use a calm, slow-paced, gentle approach during the examination. Female patients remain in the dorsal recumbent position following genitalia examination or they assume a side-lying (Sims') position. The best way to examine men is to have the patient stand and bend over forward with hips flexed and upper body resting across the examination table. Examine a nonambulatory patient in Sims' position. Use disposable gloves.

Inspection

Using the nondominant hand, gently retract the buttocks to view the perianal and sacrococcygeal areas. Perianal skin is smooth and more pigmented and coarser than skin over the buttocks. Inspect anal tissue for skin characteristics, lesions, external **hemorrhoids** (dilated veins that appear as reddened protrusions), ulcers, fissures and fistulas, inflammation, rashes, or excoriation. Anal tissues are moist and hairless and the voluntary external muscle sphincter holds the anus closed. Next, ask the patient to bear down as though having a bowel movement. Any internal hemorrhoids or fissures will appear at this time. Use clock reference (e.g., 3 o'clock, 8 o'clock) to describe location of findings. Normally there is no protrusion of tissue.

Digital Palpation

Examine the anal canal and sphincters with digital palpation, and in male patients, palpate the prostate gland to rule out enlargement (Box 31-29). Usually advanced practitioners perform this portion of the examination. This technique will not be discussed here.

Musculoskeletal System

The musculoskeletal assessment can be conducted as a separate examination or integrated into other portions of the total physical examination. Assessment can be performed during other nursing care measures such as bathing or positioning. The assessment of musculoskeletal function focuses on determining range of joint motion, muscle strength and tone, and joint and muscle condition. The assessment of musculoskeletal integrity is especially important when the patient reports pain or loss of function in a joint or muscle. Frequently, muscular disorders are the result of neurological disease. For this reason, health care providers often conduct a neurological assessment simultaneously.

While examining the patient's musculoskeletal function, visualize the anatomy of bone and muscle placement and joint structure (see Chapter 45). Joints vary in their degree of mobility. The spinal vertebrae are examples of slightly movable joints in comparison to the hinge joint movement of the knee or elbow.

For a complete examination, expose the muscles and joints so they are able to move without restriction from clothing and so that they are easy to visualize. Have the patient assume a sitting, supine, prone, or standing position while assessing

BOX 31-29 PATIENT TEACHING

Rectal and Anal Assessment

Objectives

- Patient will have a regular digital examination performed appropriate to age.
- Patient will be able to identify symptoms of colorectal and prostatic cancer.
- Patient will follow a nutritiously sound diet.

Teaching Strategies

- Discuss the Canadian Cancer Society's guidelines presented in the Canadian Cancer Encyclopedia (2011) (see <http://info.cancer.ca/ccce-eccl/default.aspx?cceid=627&Lang=E&toc=13>) for early detection of colorectal cancer with one of the following examination schedules beginning at age 50:
 - Digital rectal examination yearly
 - Fecal occult blood test (FOBT) yearly
 - Flexible sigmoidoscopy (FSIG): visual inspection of the rectum and lower colon with a hollow, lighted tube, performed by a physician every five years
 - Annual FOBT and FSIG every five years (preferred)
- Double-contrast barium enema every five years
- Colonoscopy every 10 years
- Individuals at increased risk should discuss options with their health care provider
- Discuss warning signs of colorectal cancer (see Table 31-30).
- Discuss dietary planning and healthy lifestyle choices to maintain or improve colon health.
- Warn patient against problems caused by overuse of laxatives, cathartic medications, codeine, or enemas.
- Discuss with male patient the Canadian Cancer Society's guidelines presented in the Canadian Cancer Encyclopedia (2011) for early detection of prostatic cancer (<http://info.cancer.ca/ccce-eccl/default.aspx?cceid=1173&toc=41&Lang=E>):
 - Digital rectal examination performed annually after age 50
 - Annual prostate-specific antigen (PSA) blood test for men age 50 and over
 - Prostate ultrasound testing if results of either digital rectal examination or PSA test are suspicious
- Men with a first-degree relative diagnosed with prostate cancer need to begin testing at age 45.
- Discuss the warning signs of prostatic cancer.

Evaluation

- During follow-up visits, determine whether patient has had a rectal examination performed.
- Have patient explain warning signs of colorectal and prostatic cancer.
- Ask patient to describe appropriate lifestyle and food choices for healthy colon.



swinging freely at the sides and the head leading the body. Older adults often walk with smaller steps and a wider base of support. Note foot dragging, limping, shuffling, and the position of the trunk in relation to the legs.

Observe the patient from the side in a standing position. The normal standing posture is upright with parallel alignment of the hips and shoulders (Figure 31-68). There is an even contour of the shoulders, level scapulae and iliac crests, alignment of the head over the gluteal folds, and symmetry of extremities. Looking sideways at the patient, note the normal cervical, thoracic, and lumbar curves. Holding the head erect is normal. As the patient sits, some degree of rounding of the shoulders is normal. Older adults tend to assume a stooped, forward-bent posture with the hips and knees somewhat flexed and arms bent at the elbows, raising the level of the arms.

Common postural abnormalities include lordosis, kyphosis, and scoliosis (Figure 31-69). **Kyphosis**, or hunchback, is an exaggeration of the posterior curvature of the thoracic spine. This postural abnormality is common in the older adult. **Lordosis**, or swayback, is an increased lumbar curvature. A lateral spinal curvature is called **scoliosis**. Loss of height is frequently the first clinical sign of osteoporosis, in which height loss occurs in the trunk as a result of vertebral fracture and collapse. **Osteoporosis** is a metabolic bone disease that causes a decrease in quality and quantity of bone. This disease affects 2 million Canadians, one in every four women and one in every eight men (Osteoporosis Canada, 2010). Osteoporosis affects not only adults; it strikes any age group, including children. Although a small amount of height loss is to be expected with aging, if the amount of loss is great, osteoporosis is likely (Box 31-30). As men and women age, they are more likely to have osteoporotic fractures of the forearm or wrists, hips, and vertebrae (Osteoporosis Canada, 2010).

During general inspection, look at the extremities for overall size, gross deformity, bony enlargement, alignment, and symmetry. Normally, there is bilateral symmetry in length, circumference, alignment, and position and in the number of skin folds (Seidel et al., 2011). A general review pinpoints areas requiring specialized assessment.

Palpation

Apply gentle palpation to all bones, joints, and surrounding muscles during a complete examination. In the case of a focused assessment, examine the involved area and adjacent muscle groups or joints. Note any heat, tenderness, edema, or resistance to pressure. The patient should not feel any discomfort when you palpate. Muscles should be firm.

Range of Joint Motion

The examination includes comparison of both active and passive range of motion (ROM). Ask the patient to put each major joint through active and passive full ROM (see Chapter 45). Learn the correct terminology for the movements that the joints are capable of making (Table 31-32), and instruct the patient in how to move through each range of motion. Demonstrate range of motion to the patient when possible. To assess ROM passively, ask the patient to relax and then passively move the extremities through their range of motion. Compare the same body parts for bilateral equality and symmetry in movement. Figure 31-70 shows an example of range-of-motion positions for the hand and wrist. Do not force a joint into a painful position. Know the normal range of each joint

certain muscle groups. Table 31-31 lists the information gathered in the nursing history.

General Inspection

Observe the patient's gait when he or she enters the examination room. When a patient is unaware of the nature of the observation, gait is more natural. Later, a more formal test has the patient walk in a straight line away and then return to point of origin. Note how the patient walks, sits, and rises from a sitting position. Normally, patients walk with the arms

► **TABLE 31-31** Nursing History for Musculoskeletal Assessment**Assessment Category**

Determine if patient is involved in competitive sports (particularly involving collision and contact), fails to warm up adequately, is in poor physical condition, or had had a rapid growth spurt (adolescents).

Review patient history for use of alcohol and/or caffeine; cigarette smoking; constant dieting; calcium intake less than 500 mg daily; thin and light body frame; nulliparous status; menopause before age 45; estrogen deficiency; postmenopause status; family history of osteoporosis; advanced age; history of fractures/falls; sedentary lifestyle; chronic diseases (Cushing's hyperthyroidism and hypothyroidism, malabsorption/malnutrition disorders, neoplasm); long-term use of corticosteroids, methotrexate, phenytoin, aluminum-containing antacids; lack of weight-bearing exercise; lack of exposure to sunlight or inadequate vitamin D intake (Holcomb, 2005).

Ask patient to describe history of problems in bone, muscle, or joint function (e.g., recent fall, trauma, lifting of heavy objects, history of bone or joint disease with sudden or gradual onset, location of alteration).

Assess nature and extent of pain, including location, duration, severity, predisposing and aggravating factors, relieving factors, and type.

Assess patient's normal activity pattern, including type of exercise routinely performed.

Determine how alteration influences ability to perform activities of daily living (e.g., bathing, feeding, dressing, toileting, ambulating) and social functions (e.g., household chores, work, recreation, sexual activities).

Assess height loss of women over age 50 by subtracting current height from recall of maximum adult height.

Rationale

These are risk factors for sports injury.

These are risk factors for osteoporosis.

History assists in assessing nature of musculoskeletal problem.

Pain frequently accompanies alterations in bone, joints, or muscle. This has implications for not only comfort, but also ability to perform activities of daily living.

Provides baseline in assessment. Sedentary lifestyle and lack of appropriate exercise increases bone loss and risk of fractures.

The extent to which patient is able to perform self-care will determine the level of nursing care. Type and degree of restriction in continuing social activities influence topics for patient education and ability of nurse to identify alternative ways to maintain function.

Measurement is useful screening tool to predict osteoporosis.

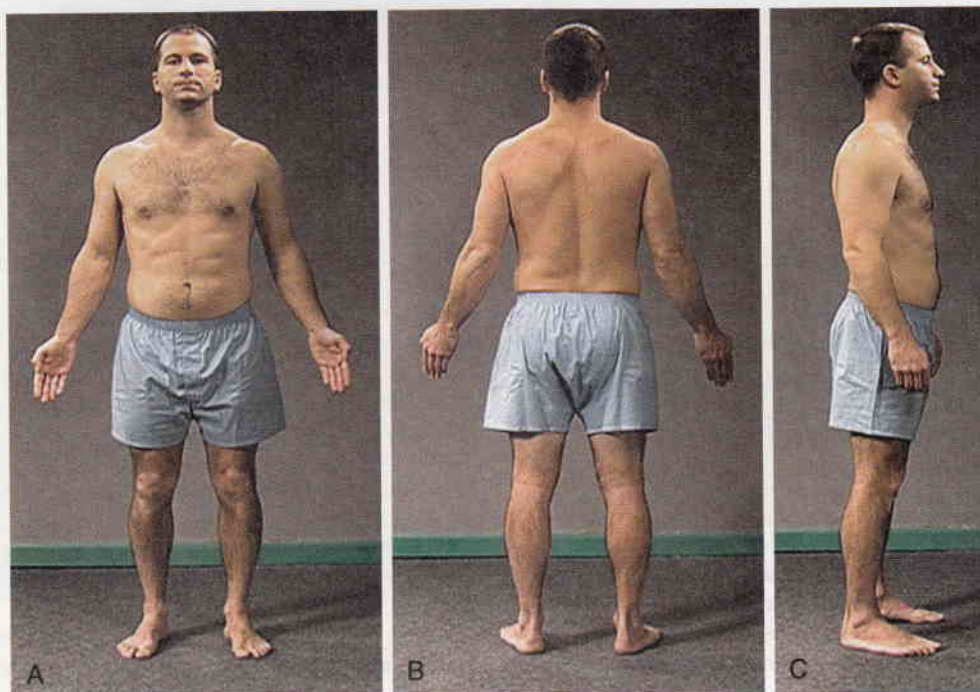


Figure 31-68 Inspection of overall body posture. **A**, Anterior view. **B**, Posterior view. **C**, Lateral view. **Source:** From Seidel, H. M., et al. (2011). *Mosby's guide to physical examination* (7th ed., p. 661). St Louis, MO: Mosby.

BOX 31-30 PATIENT TEACHING

Musculoskeletal Assessment

Objectives

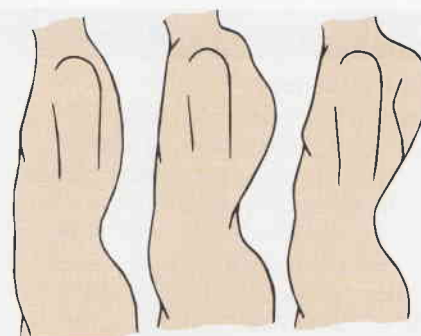
- Patient will follow measures to prevent or minimize osteoporosis.
- Patient will assume proper body posture.
- Patient will be able to perform self-care measures.

Teaching Strategies

- Instruct patient in correct postural alignment. Consult with physical therapist to provide patient with exercises for improving posture.
- Recommend women and men age 50 and older for routine screening for osteoporosis (Papaioannou et al., 2010).
- To reduce bone demineralization, instruct older adults in a proper exercise program (e.g., weight-bearing, muscle-strengthening, and balance-training exercise) to be followed three or more times a week.
- Encourage intake of calcium to meet the recommended daily allowance. Increased vitamin D will aid calcium absorption.
- Recommendation for daily calcium intake for children 4 to 8 years (800mg), 9 to 18 years (1300 mg), adults 19 to 50 years (1000 mg), and older adults 50+ years (1200 mg) (Osteoporosis Canada, 2010). If supplementing to achieve recommended calcium intake, instruct patient to take no more than 600 mg of calcium at one time.
- Recommended vitamin D supplementation is 400 to 1000 IU for low-risk adults and 800 to 1200 IU for high-risk older adults (Hanley et al., 2010).
- Explain to patients with low back pain that they will benefit from modification of worker risk factors (e.g., lifting heavy weights, use of protective equipment), regular aerobic exercise, exercises that strengthen the back and increase trunk flexibility, and learning how to lift properly.
- Instruct older adults and those with osteoporosis in proper body mechanics and range-of-motion and moderate weight-bearing exercises (e.g., swimming and walking) to minimize trauma and subsequent fracture of bones.
- Instruct patient in use of assistive devices (e.g., zippers on clothing instead of buttons; elevation of chairs to minimize bending of knees and hips) when patient is unable to perform activities of daily living.
- Instruct older patients to pace activities to compensate for loss in muscle strength and to avoid falls.

Evaluation

- Observe patient's posture.
- Ask patient to describe therapies for preventing osteoporosis.
- Observe patient perform range-of-motion exercises.
- Have patient keep log of regular weight-training exercises.
- Ask patient or family members to describe patient's use of self-care aids.



Lordosis Kyphosis Scoliosis
A B C

Figure 31-69 Common postural abnormalities. A, Lordosis. B, Kyphosis. C, Scoliosis.

TABLE 31-32

Terminology for Normal Range-of-Motion Positions

Term	Range of Motion	Examples of Joints
Flexion	Movement decreasing angle between two adjoining bones; bending of limb	Elbow, fingers, knee
Extension	Movement increasing angle between two adjoining bones	Elbow, knee, fingers
Hyperextension	Movement of body part beyond its normal resting extended position	Head
Pronation	Movement of body part so that front or ventral surface faces downward	Hand, forearm
Supination	Movement of body part so that the front or ventral surface faces upward	Hand, forearm
Abduction	Movement of extremity away from midline of body	Leg, arm, fingers
Adduction	Movement of extremity toward midline of body	Leg, arm, fingers
Internal rotation	Rotation of joint inward	Knee, hip
External rotation	Rotation of joint outward	Knee, hip
Eversion	Turning of body part away from midline	Foot
Inversion	Turning of body part toward midline	Foot
Dorsiflexion	Flexion of toes and foot upward	Foot
Plantar flexion	Bending of toes and foot downward	Foot

and the extent to which you can move the patient's joints. Range of motion is equal between contralateral joints. Ideally, assess the patient's normal range to determine a baseline for assessing later change.

A **goniometer**, frequently used by physical and occupational therapists, measures the precise degree of motion in a particular joint and is mainly for patients who have a suspected reduction in joint movement. The instrument has two

flexible arms with a 180-degree protractor in the centre. Position the centre of the protractor at the centre of the joint you are measuring (Figure 31-71). The arms extend along the body parts on each side of the protractor. You take a measurement of the joint angle before moving the joint. After taking the joint

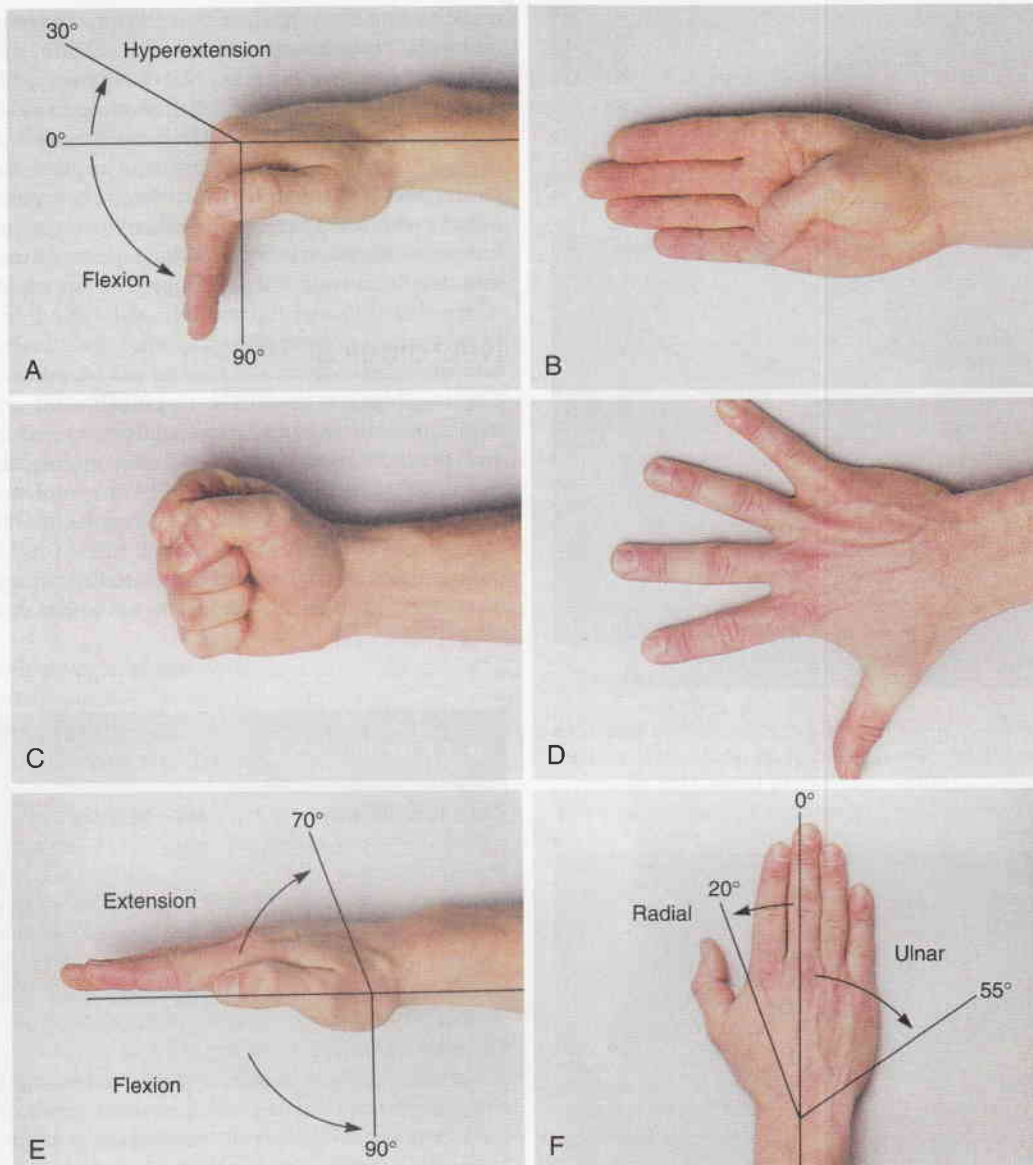


Figure 31-70 Range of motion of the hand and wrist. **A**, Metacarpophalangeal flexion and hyperextension. **B**, Finger flexion: thumb to each fingertip and to the base of the little finger. **C**, Finger flexion, fist formation. **D**, Finger abduction. **E**, Wrist flexion and hyperextension. **F**, Wrist radial and ulnar movement. **Source:** From Seidel, H. M., et al. (2011). *Mosby's guide to physical examination* (7th ed., p. 665). St Louis, MO: Mosby.

through a full ROM, measure the angle again to determine the degree of movement. Compare the reading with the normal degree of joint movement.

Joints are typically free from stiffness, instability, swelling, or inflammation. There should be no discomfort when applying pressure to bones and joints. In older adults, joints often become swollen and stiff with reduced ROM resulting from cartilage erosion and fibrosis of synovial membranes (see Chapter 45). If a joint appears swollen and inflamed, palpate it for warmth.

Muscle Tone and Strength

Assess muscle strength and tone during ROM measurement. Integrate these findings with those from the neurological assessment. Note muscle tone, the slight muscular resistance felt as you move the relaxed extremity passively through its ROM.

Ask the patient to allow an extremity to relax or hang limp. This is often difficult, particularly if the patient feels pain in the extremity. Support the extremity, and grasp each limb, moving it through the normal ROM (Figure 31-72). Normal tone causes a mild, even resistance to movement through the entire range.

If a muscle has increased tone, or **hypertonicity**, you will meet considerable resistance with any sudden passive movement of a joint. Continued movement eventually causes the muscle to relax. A muscle that has little tone (**hypotonicity**) feels flabby. The involved extremity hangs loosely in a position determined by gravity.

For assessment of muscle strength, the patient assumes a stable position. The patient performs manoeuvres demonstrating strength of major muscle groups (Table 31-33). Compare symmetrical muscle pairs for strength based on a grading scale of 0 to 5 (Table 31-34). The arm on the dominant side is

normally stronger than the arm on the nondominant side. In the older adult, a loss of muscle mass causes bilateral weakness, but muscle strength remains greater in the dominant arm or leg.

Examine each muscle group. Ask the patient to first flex the muscle you are examining and then to resist when you apply

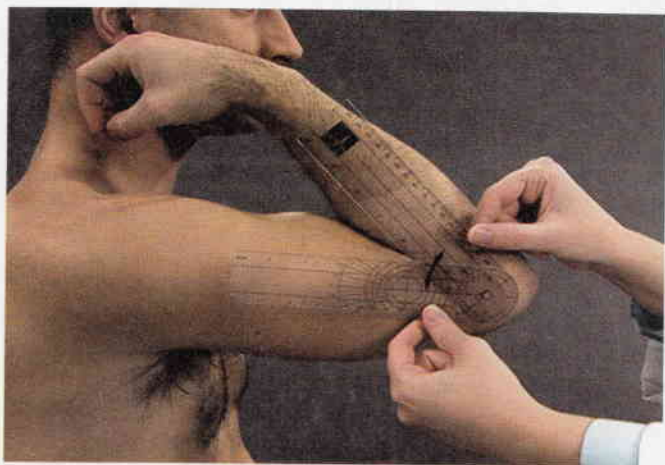


Figure 31-71 The patient flexes the arm; the goniometer measures joint range of motion. **Source:** From Seidel, H. M., et al. (2011). *Mosby's guide to physical examination* (7th ed., p. 662). St Louis, MO: Mosby.



Figure 31-72 Assessing muscle tone.

an opposing force against that flexion. It is important to not allow the patient to move the joint. Gradually increase pressure to a muscle group (e.g., elbow extension). Have the patient resist the pressure applied by attempting to move against resistance (e.g., elbow flexion). The patient resists until instructed to stop. Vary the amount of pressure applied, then observe the joint move. If you identify a weakness, compare the size of the muscle with its opposite counterpart by measuring the circumference of the muscle body with a tape measure. A muscle that has atrophied feels soft and boggy when palpated.

Neurological System

The neurological system is responsible for many functions, including initiation and coordination of movement, reception and perception of sensory stimuli, organization of thought processes, control of speech, and storage of memory. A close integration exists between the neurological system and all other body systems. For example, urine production relies in part on the adequacy of blood flow to the kidneys, and the size of arterioles supplying the kidneys is under neural control.

TABLE 31-33

Manoeuvres to Assess Muscle Strength

Muscle Group	Manoeuvre
Neck (sternocleidomastoid)	Place hand firmly against patient's upper jaw. Ask patient to turn head laterally against resistance.
Shoulder (trapezius)	Place hand over midline of patient's shoulder, exerting firm pressure. Have patient raise shoulders against resistance.
Elbow	
Biceps	Pull down on forearm as patient attempts to flex arm.
Triceps	As you flex patient's arm, apply pressure against forearm. Ask patient to straighten arm.
Hip	
Quadriceps	When patient is sitting, apply downward pressure to thigh. Ask patient to raise leg up from table.
Gastrocnemius	Patient sits, while examiner holds shin of flexed leg. Ask patient to straighten leg against resistance.

TABLE 31-34 Muscle Strength

Muscle Function Level	SCALES		
	Grade	% Normal	Lovett Scale
No evidence of contractility	0	0	0 (zero)
Slight contractility, no movement	1	10	T (trace)
Full range of motion, gravity eliminated*	2	25	P (poor)
Full range of motion with gravity	3	50	F (fair)
Full range of motion against gravity, some resistance	4	75	G (good)
Full range of motion against gravity, full resistance	5	100	N (normal)

From Barkauskas, V. H., et al. (2002). *Health and physical assessment* (3rd ed.). St Louis, MO: Mosby.

*Passive movement.

An assessment of neurological function alone is quite time consuming. For efficiency, integrate neurological measurements with other parts of the physical examination. For example, test cranial nerve function during the survey of the head and neck. Observe mental and emotional status during the initial interview.

Consider many variables when deciding the extent of the examination. A patient's level of consciousness influences the ability to follow directions. General physical status influences tolerance to assessment. The patient's chief complaint also helps determine the need for a thorough neurological assessment. If the patient complains of headache or a recent loss of function in an extremity, the patient will need a complete neurological review. Table 31-35 reviews the data collected in the nursing history. For a complete examination, you will need the following special equipment:

- Reading material
- Vials containing aromatic substances (e.g., vanilla extract and coffee)
- Opposite tip of cotton swab or tongue blade broken in half
- Snellen eye chart
- Penlight
- Vials containing sugar or salt
- Tongue blade
- Two test tubes, one filled with hot water and the other with cold water
- Cotton balls or cotton-tipped applicators
- Tuning fork
- Reflex hammer

Mental and Emotional Status

You learn a great deal about mental capacities and emotional state by simply interacting with the patient. Ask questions during an examination to gather data and observe the appropriateness of emotions and thoughts. There are special screening tools designed to assess a patient's mental status. A widely used tool in the screening for cognitive impairment is the Montreal Cognitive Assessment, which is focused on the assessment of mild cognitive impairment (Nasreddine et al., 2005); available at <http://www.mocatest.org/>. The Mini-Mental State Examination (MMSE) is another screening instrument developed by Folstein et al. (1975) that measures orientation and cognitive function. The sample questions in Box 31-31 offer examples of questions found on the MMSE. A maximum score on the MMSE is 30. Patients with scores of 21 or less generally reveal cognitive impairment requiring further evaluation.

To ensure an objective assessment, consider the patient's cultural and educational background, values, beliefs, and previous experiences. Such factors influence responses to questions. An alteration in mental or emotional status reflects a disturbance in cerebral functioning. The cerebral cortex controls and integrates intellectual and emotional functioning. Primary brain disorders, medication, and metabolic changes are examples of factors that change cerebral function.

Delirium is a common mental disorder among older adults. It is an acute mental disorder characterized by confusion, disorientation, and restlessness. The acute condition is often misdiagnosed as a form of dementia, a more progressive, organic mental disorder such as Alzheimer's disease. Thus many health care providers miss the underlying cause of the condition. When it occurs, many think it is common older adult behaviour. Delirium is often overlooked in older adults because of a failure to adequately assess mental status. Fortunately, the

► TABLE 31-35

Nursing History for Neurological Assessment

Assessment Category

Rationale

Determine patient use of analgesics, alcohol, sedatives, hypnotics, antipsychotics, antidepressants, nervous system stimulants, or recreational drugs.	These medications alter level of consciousness or cause behavioural changes. Abuse sometimes causes tremors, ataxia, and changes in peripheral nerve function.
Determine if patient has recent history of seizures/convulsions: clarify sequence of events (aura, fall to ground, motor activity, loss of consciousness); character of any symptoms; and relationship of seizure to time of day, fatigue, or emotional stress.	Seizure activity often originates from central nervous system alteration. Characteristics of seizure help determine its origin.
Screen patient for symptoms of headache, tremors, dizziness, vertigo, numbness or tingling of body part, visual changes, weakness, pain, or changes in speech. Presence of any symptom requires more detailed review (onset, severity, precipitating factors or sequence of events).	These symptoms frequently originate from alterations in central nervous system or peripheral nervous system function. Identification of specific patterns aids in diagnosis of pathological condition.
Discuss with patient's family any recent changes in patient's behaviour (e.g., increased irritability, mood swings, memory loss, change in energy level).	Behavioural changes sometimes result from intracranial pathological states.
Assess patient for history of change in vision, hearing, smell, taste, or touch.	Major sensory nerves originate from brain stem. These symptoms help to localize nature of problem.
If an older patient displays sudden acute confusion (delirium), review history for drug toxicity (anticholinergics, diuretics, digoxin, cimetidine, sedatives, antihypertensives, antiarrhythmics), serious infections, metabolic disturbances, heart failure, and severe anemia.	This is one of the most common mental disorders in older people. Condition is always potentially reversible (see Box 31-32).
Review past history for head or spinal cord injury, meningitis, congenital anomalies, neurological disease, or psychiatric counselling.	Factors cause neurological symptoms or behavioural changes to develop, focusing assessment on possible cause.

condition often reverses when it is correctly assessed and the underlying cause is treated (central nervous system [CNS], metabolic, and cardiopulmonary disorders; systemic illnesses; and sensory deprivation or overload) (Stuart & Laraia, 2005). Frequently, patients who develop delirium are labelled with sundown syndrome because the delirium frequently worsens

► BOX 31-31 MMSE Sample Questions

- Orientation to time
"What is the date?"
- Registration
"Listen carefully. I am going to say three words. You say them back after I stop. Ready? Here they are ...
"HOUSE (pause), CAR (pause), LAKE (pause). Now repeat those words back to me."
[Repeat up to five times, but score only the first trial.]
- Naming
"What is this?" [Point to a pencil or pen.]
- Reading
"Please read this and do what it says." [Show examinee the words on the stimulus form.]
CLOSE YOUR EYES

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► BOX 31-32 Clinical Criteria for Delirium

- **Definition:** An acute disturbance of consciousness that is accompanied by a change in cognition. It is not due to a preexisting or evolving dementia. Delirium develops over a short period of time, usually hours to days, and tends to fluctuate during the course of the day. It is usually a direct physiological consequence of a general medical condition. It is most common in older adults, but occurs occasionally in younger patients.
- There is reduced clarity of awareness of the environment.
- Ability to focus, sustain, or shift attention is impaired (questions must be repeated).
- Irrelevant stimuli easily distract the person.
- There is an accompanying change in cognition (memory impairment, disorientation, or language disturbance).
- Commonly affects recent memory.
- Disorientation usually occurs, with patient disoriented to time, place, or person.
- Language disturbance involves impaired ability to name objects or ability to write; speech is sometimes rambling.
- Perceptual disturbances include misinterpretations, delusions, or visual and auditory hallucinations. Neurological signs include tremor, unsteady gait, asterixis, or myoclonus.

Modified from American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders (DSM-IV-TR)*. Washington, DC: Author; Stuart, G., & Lauria, M. (2005). *Principles and practice of psychiatric nursing* (8th ed.). St Louis, MO: Mosby.

► TABLE 31-36 Glasgow Coma Scale

Action	Response	Score
Eyes open	Spontaneously	4
	To speech	3
	To pain	2
	None	1
Best verbal response	Oriented	5
	Confused	4
	Inappropriate words	3
	Incomprehensible sounds	2
Best motor response	None	1
	Obeys commands	6
	Localized pain	5
	Flexion withdrawal	4
	Abnormal flexion	3
	Abnormal extension	2
	Flaccid	1
TOTAL SCORE		15

and cooperation to unresponsiveness to any form of external stimuli. Talk with the patient, asking questions about events involving the patient or concerns about any health problems. A fully conscious patient responds to questions quickly and expresses ideas logically. With a lowering of the patient's consciousness, use the Glasgow Coma Scale (GCS) for an objective measurement of consciousness on a numerical scale (Table 31-36). The patient needs to be as alert as possible before testing. Use caution when using the scale if a patient has sensory losses (e.g., vision, hearing). The GCS allows evaluation of a patient's neurological status over time. The higher the score, the better the patient's neurological function. Ask short, simple questions such as "What is your name?" "Where are you?" and "What day is this?" Also ask the patient to follow simple commands, such as "Move your toes."

If a patient is not conscious enough to follow commands, try to elicit the pain response. Apply firm pressure with the thumb over the root of the patient's fingernail. The normal response to the painful stimuli is withdrawal of the body part from the stimulus. A patient with serious neurological impairment exhibits abnormal posturing in response to pain. A flaccid response indicates the absence of muscle tone in the extremities and severe injury to brain tissue.

Behaviour and Appearance. Behaviour, moods, hygiene, grooming, and choice of dress reveal pertinent information about mental status. Remain perceptive of the patient's mannerisms and actions during the entire physical assessment. Note nonverbal and verbal behaviours. Does the patient respond appropriately to directions? Does the patient's mood vary with no apparent cause? Does the patient show concern about appearance? Is the patient's hair clean and neatly groomed, and are the nails trim and clean? The patient should behave in a manner expressing concern and interest in the examination. The patient should make eye contact with the nurse and express appropriate feelings that correspond to the situation. Normally, the patient will show some degree of personal hygiene.

Choice and fit of clothing reflect socioeconomic background or personal taste rather than deficiency in self-concept or self-care. Avoid being judgemental, and focus assessment on the appropriateness of clothing for the weather. Older adults

at night. Many practitioners mistake this as being common with old age. Be aware that delirium has occurred in children having surgery (20%) and hospitalized children (8%) (Stuart & Laraia, 2005). Obtain a good history of the patient's behaviour before delirium develops so as to recognize the condition early. Family members are usually a good resource. Box 31-32 summarizes clinical criteria for delirium.

Level of Consciousness. A person's level of consciousness exists along a continuum from full awakening, alertness,

sometimes neglect their appearance because of a lack of energy, finances, or reduced vision.

Language. Normal cerebral function allows a person to understand spoken or written words and to express the self through written words or gestures. Assess the patient's voice inflection, tone, and manner of speech. Normally, the patient's voice has inflections, is clear and strong, and increases in volume appropriately. Speech is fluent. When communication is clearly ineffective (e.g., omission or addition of letters and words, misuse of words, or hesitations), assess for **aphasia**. Injury to the cerebral cortex results in aphasia.

The two types of aphasia are sensory (or receptive) and motor (or expressive). With receptive aphasia, a person cannot understand written or verbal speech. With expressive aphasia, a person understands written and verbal speech but cannot write or speak appropriately when attempting to communicate. A patient sometimes suffers a combination of receptive and expressive aphasia. Assess language capabilities when it is clear that ineffective communication with the patient exists. Some simple assessment techniques are the following:

- Point to a familiar object, and ask the patient to name it.
- Ask the patient to respond to simple verbal and written commands, such as "Stand up" or "Sit down."
- Ask the patient to read simple sentences out loud.

Normally, a patient names objects correctly, follows commands, and reads sentences correctly.

Intellectual Function

Intellectual function includes memory (recent, immediate, and past), knowledge, abstract thinking, association, and judgement. Testing each aspect of function involves a specific technique. However, because cultural and educational background influences the ability to respond to test questions, do not ask questions related to concepts or ideas with which the patient is unfamiliar.

Memory. Assess immediate recall and recent and remote memory. Patients demonstrate immediate recall by repeating a series of numbers (e.g., 7, 4, 1) in the order they are presented or in reverse order. Patients normally recall a series of five to eight digits forward and four to six digits backward.

First ask to test the patient's memory. Then state clearly and slowly the name of three unrelated objects. After mentioning all three, ask the patient to repeat each. Continue until the patient is successful. Then, later in the assessment, ask the patient to repeat the three words again. The patient should be able to identify the three words. Another test for recent memory involves asking the patient to recall events occurring during the same day (e.g., what was eaten for breakfast). Validate information with a family member.

To assess past memory, ask the patient to recall the maiden name of the patient's mother, a birthday, or a special date in history. It is best to ask open-ended questions rather than simple yes/no questions. A patient usually has immediate recall of such information. With older adults, do not interpret a hearing loss as confusion. Good communication techniques are essential throughout the examination to ensure that the patient clearly understands all directions and testing.

Knowledge. Assess knowledge by asking how much the patient knows about his or her illness or the reason for seeking health care. By assessing a patient's knowledge, you can determine a patient's ability to learn or understand. If there is an opportunity to teach, test the patient's mental status by asking for feedback during a follow-up visit.

Abstract Thinking. Interpreting abstract ideas or concepts reflects the capacity for abstract thinking. For an individual to explain common phrases such as "A stitch in time saves nine" or "Don't count your chickens before they're hatched" requires a higher level of intellectual function. Note whether the patient's explanations are relevant and concrete. The patient with altered mental status will probably interpret the phrase literally or merely rephrase the words.

Association. Another higher level of intellectual functioning involves finding similarities or associations between concepts: a dog is to a beagle as a cat is to a Siamese. Name related concepts, and ask the patient to identify their associations. Questions are appropriate to the patient's level of intelligence. Using simple concepts is sufficient.

Judgement. Judgement requires a comparison and evaluation of facts and ideas to understand their relationships and to form appropriate conclusions. Attempt to measure the patient's ability to make logical decisions with questions such as "Why did you seek health care?" or "What would you do if you became ill at home?" Normally a patient makes logical decisions.

Cranial Nerve Function

A physical examination can involve the assessment of all 12 cranial nerves or a single nerve or related group of nerves. A dysfunction in one nerve reflects an alteration at some point along the distribution of the cranial nerve. Measurements used to assess the integrity of organs within the head and neck also assess cranial nerve function. A complete assessment involves testing the 12 cranial nerves in order of their numbers. To remember the order of the nerves, use this simple phrase: "On old Olympus' towering tops, a Finn and German viewed some hops." The first letter of each word in the phrase is the same as the first letter of the names of the cranial nerves listed in order (Table 31-37).

Sensory Function

The sensory pathways of the central nervous system conduct sensations of pain, temperature, position, vibration, and crude and finely localized touch. Different nerve pathways relay the sensations. Most patients require only a quick screening of sensory function unless there are symptoms of reduced sensation, motor impairment, or paralysis.

safety alert The risk of skin breakdown is greater in a patient with impaired sensation. When assessing decreased sensation, complete a skin and tissue assessment of the area affected by the sensory loss. In addition, teach the patient to avoid pressure, thermal, and/or chemical trauma to the area.

Normally a patient has sensory responses to all stimuli that are tested. A patient feels sensations equally on both sides of the body in all areas. Assess the major sensory nerves by knowing the sensory dermatome zones (Figure 31-73). Some areas of the skin are innervated by specific dorsal root cutaneous nerves. For example, if assessment reveals reduced sensation when checking for light touch along an area of the skin (e.g., the lower neck), this determines, in general, where a neurological lesion exists (e.g., fourth cervical spinal cord segment).

Perform all sensory testing with the patient's eyes closed so that the patient is unable to see when or where a stimulus strikes the skin (Table 31-38). Then apply stimuli in a random,

► TABLE 31-37 Cranial Nerve Function and Assessment

Number	Name	Type	Function	Method
I	Olfactory	Sensory	Sense of smell	Ask patient to identify different nonirritating aromas such as coffee and vanilla.
II	Optic	Sensory	Visual acuity	Use Snellen chart, or ask patient to read printed material while wearing glasses.
III	Oculomotor	Motor	Extraocular eye movement	Assess directions of gaze.
IV	Trochlear	Motor	Pupil constriction and dilation Upward and downward movement of eyeball	Measure pupillary reaction to light reflex and accommodation. Assess directions of gaze.
V	Trigeminal	Sensory and motor	Sensory nerve to skin of face	Lightly touch cornea with wisp of cotton. Assess corneal reflex. Measure sensation of light pain and touch across skin of face.
VI	Abducens	Motor	Motor nerve to muscles of jaw	Palpate temples as patient clenches teeth.
VII	Facial	Sensory and motor	Lateral movement of eyeballs Facial expression	Assess directions of gaze. As patient smiles, frowns, puffs out cheeks, and raises and lowers eyebrows, look for asymmetry.
VIII	Auditory	Sensory	Taste	Have patient identify salty or sweet taste on front of tongue.
IX	Glossopharyngeal	Sensory and motor	Hearing Taste	Assess ability to hear spoken word. Ask patient to identify sour or sweet taste on back of tongue.
X	Vagus	Sensory and motor	Ability to swallow Sensation of pharynx	Use tongue blade to elicit gag reflex. Ask patient to say "ah." Observe movement of palate and pharynx.
XI	Spinal accessory	Motor	Movement of vocal cords Movement of head and shoulders	Assess speech for hoarseness. Ask patient to shrug shoulders and turn head against passive resistance.
XII	Hypoglossal	Motor	Position of tongue	Ask patient to stick out tongue to midline and move it from side to side.

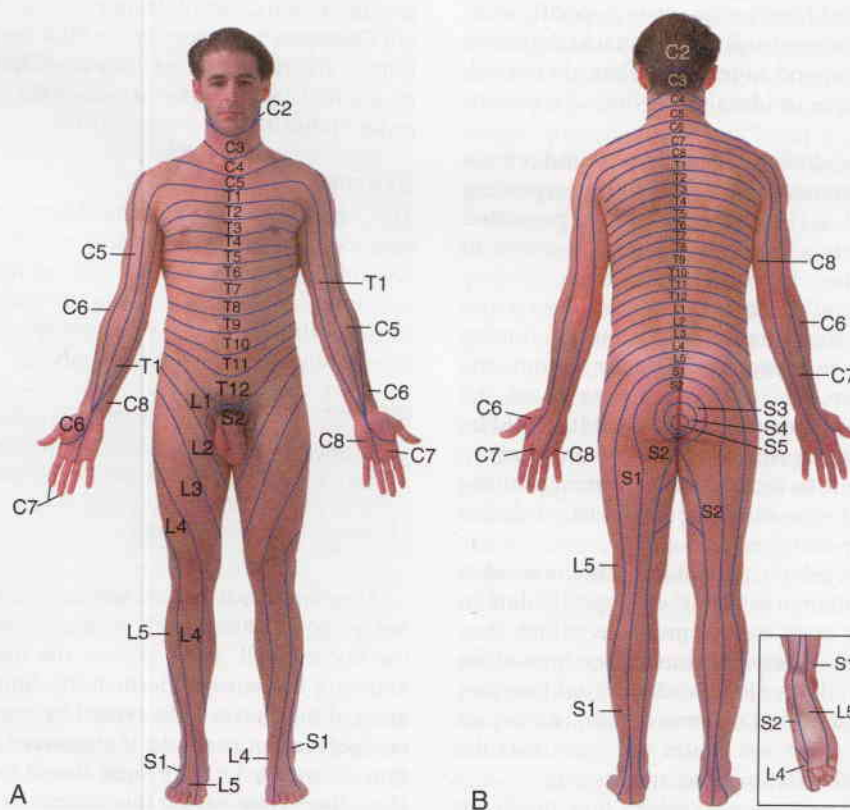


Figure 31-73 Dermatomes of the body, the body surface areas innervated by particular spinal nerves; C1 usually has no cutaneous distribution. **A**, Anterior view. **B**, Posterior view. It appears that there is a distinct separation of surface area controlled by each dermatome, but there is almost always overlap between spinal nerves. **Source:** From Seidel, H. M., et al. (2011). *Mosby's guide to physical examination* (7th ed., p. 708). St Louis, MO: Mosby.

► TABLE 31-38 Assessment of Sensory Nerve Function

Function	Equipment	Method	Precautions
Pain	Broken tongue blade or wooden end of cotton applicator	Ask patients to voice when they feel dull or sharp sensation. Alternately apply sharp and blunt ends of tongue blade to skin's surface. Note areas of numbness or increased sensitivity.	Remember that areas where skin is thick, such as heel or sole of foot, are less sensitive to pain.
 			
		Assessing sensory nerve function in foot	Assessing sensory nerve function in face
Temperature	Two test tubes, one filled with hot water and other with cold	Touch skin with tube. Ask patient to identify hot or cold sensation.	Omit test if pain sensation is normal.
Light touch	Cotton ball or cotton-tip applicator	Apply light wisp of cotton to different points along skin's surface. Ask patients to voice when they feel a sensation.	Apply at areas where skin is thin or more sensitive (e.g., face, neck, inner aspect of arms, top of feet and hands).
Vibration	Tuning fork	Apply stem of vibrating fork to distal interphalangeal joint of fingers and interphalangeal joint of great toe, elbow, and wrist. Have patients voice when and where they feel vibration.	Be sure patient feels vibration and not merely pressure.
Position		Grasp finger or toe, holding it by its sides with thumb and index finger. Alternate moving finger or toe up and down. Ask patient to state when finger is up or down. Repeat with toes.	Avoid rubbing adjacent appendages as you move finger or toe. Do not move joint laterally; return to neutral position before moving again.
Two-point discrimination	Two broken tongue blades	Lightly apply one or both tongue blade tips simultaneously to the skin's surface. Ask patients whether they feel one or two pricks. Find the distance at which patient can no longer distinguish two points.	Apply blade tips to same anatomical site (e.g., fingertips, palm of hand, or upper arms). Minimum distance at which patient discriminates two points varies (2 to 8 mm on fingertips).

unpredictable order to maintain the patient's attention and prevent detection of a predictable pattern. Ask the patient to describe when, what, and where he or she feels each stimulus. Compare symmetrical areas of the body while applying stimuli to the patient's arms, trunk, and legs.

Motor Function

An assessment of motor function includes measurements made during the musculoskeletal examination. In addition, you assess cerebellar function. The cerebellum coordinates muscular activity, maintains balance and equilibrium, and controls posture.

Coordination. To avoid confusion, demonstrate each manoeuvre and then have the patient repeat it, observing for

smoothness and balance in the patient's movements (Box 31-33). In older adults, normally slow reaction time causes movements to be less rhythmical.

To assess fine motor function, have the patient extend the arms out to the sides and touch each forefinger alternately to the nose (first with eyes open, then with eyes closed). Normally the patient alternately touches the nose smoothly. Performing rapid, rhythmical, alternating movements demonstrates coordination in the upper extremities. While sitting, the patient begins by patting the knees with both hands. Then the patient alternately turns up the palm and back of the hands while continuously patting the knees. Normally patients perform the manoeuvre smoothly and regularly with increasing speed.

BOX 31-33 PATIENT TEACHING

Neurological Assessment

Objectives

- Patient's family will understand relationship of patient's behavioural and mental changes to physical status.
- Patient with sensory or motor impairment will select safety measures for self-care.
- Older adult will routinely inspect skin for injuries.

Teaching Strategies

- Explain to family or friends the implications of any behavioural or mental impairment shown by patient.
- If patient has sensory or motor impairments, explain measures to ensure safety (e.g., use of ambulation aids or safety bars in bathrooms or stairways).
- Teach older adult to plan enough time to complete tasks because reaction time is slow.
- Teach older adult to observe skin surfaces for areas of trauma, because perception of pain is reduced.

Evaluation

- Ask family to discuss patient behaviours that result from neurological impairments.
- Have patient explain safety measures used to avoid injury from sensory and motor limitations.
- Have older patient explain reason for inspecting skin surface routinely.

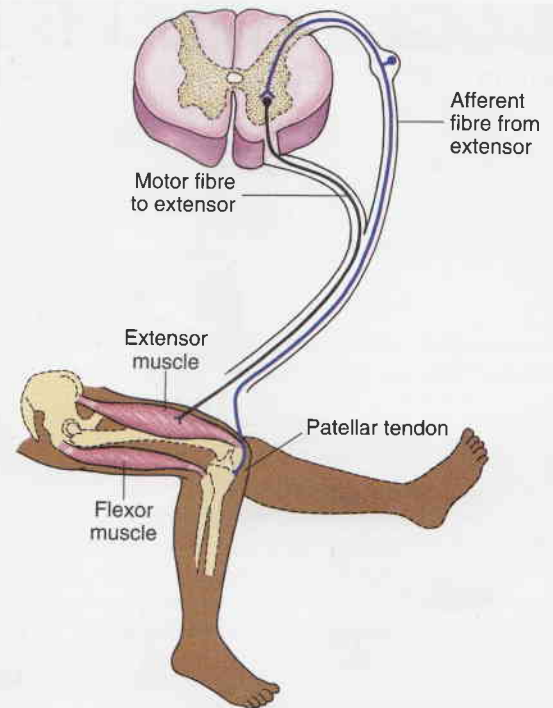


Figure 31-74 Pathway of the reflex arc.

An additional manoeuvre for upper extremity coordination involves touching each finger with the thumb of the same hand in rapid sequence. The patient moves from the index finger to the little finger and back, with one hand tested at a time. The patient's dominant hand is slightly less awkward when performing this movement. Movement is smooth and in succession.

Test lower extremity coordination with the patient lying supine, legs extended. Place a hand at the ball of the patient's foot. The patient taps the hand with the foot as quickly as possible. Test each foot for speed and smoothness. The feet do not move as rapidly or evenly as the hands.

Balance. Use one or two of the following tests to assess balance and gross motor function:

- Have the patient perform a Romberg test by standing with feet together, arms at the sides, both with eyes open and eyes closed. Protect the patient's safety by standing at the side, observe for swaying. Expect slight swaying of the body in the Romberg test. A loss of balance (positive Romberg) causes a patient to fall to the side. Normally the patient does not break the stance.
- Have the patient close the eyes, with arms held straight at the sides, and stand on one foot and then the other. Normally patients are able to maintain balance for five seconds with slight swaying.
- Ask the patient to walk a straight line by placing the heel of one foot directly in front of the toes of the other foot.

safety alert When examining the older adult patient's gait, be aware of the risk for falls. Some older adult patients need assistance with this portion of the examination.

Reflexes

Eliciting reflex reactions provides data about the integrity of sensory and motor pathways of the reflex arc and specific spinal cord segments. Assessment of reflexes does not determine higher neural centre functioning. Figure 31-74 traces the pathway of the reflex arc. Each muscle contains a small sensory unit called a muscle spindle, which controls muscle tone and detects changes in the length of muscle fibres. Tapping a tendon with a reflex hammer stretches the muscle and tendon, lengthening the spindle. The spindle sends nerve impulses along afferent nerve pathways to the dorsal horn of the spinal cord segment. Within milliseconds, the impulses reach the spinal cord and synapse to travel to the efferent motor neuron in the spinal cord. A motor nerve sends the impulses back to the muscle, causing the reflex response.

The two categories of normal reflexes are deep tendon reflexes, elicited by mildly stretching a muscle and tapping a tendon, and cutaneous reflexes, elicited by stimulating the skin superficially. Grade reflexes are as follows (Jarvis et al., 2009):

- 0 No response
- 1+ Sluggish or diminished
- 2+ Active or expected response
- 3+ More brisk than expected, slightly hyperactive
- 4+ Brisk and hyperactive with intermittent or transient clonus

When assessing reflexes, have the patient relax as much as possible to avoid voluntary movement or tensing of muscles. Position the limbs to slightly stretch the muscle being tested. Hold the reflex hammer loosely between the thumb and fingers so that it is able to swing freely and tap the tendon briskly (Figure 31-75). Compare the responses on corresponding sides. Normally the older adult presents with diminished reflexes. Reflexes are hyperactive in patients with alcohol, cocaine, or opioid intoxication (Caulker-Burnett, 1994). Stick figures are

► TABLE 31-39 Assessment of Common Reflexes

Type	Procedure	Normal Reflex
Deep Tendon Reflexes		
Biceps	Flex patient's arm up to 45 degrees at elbow with palms down. Place your thumb in antecubital fossa at base of biceps tendon and your fingers over biceps muscle. Strike triceps tendon with reflex hammer.	Flexion of arm at elbow
Triceps	Flex patient's arm at elbow, holding arm across chest, or hold upper arm horizontally and allow lower arm to go limp. Strike triceps tendon just above elbow.	Extension at elbow
Patellar	Have patient sit with legs hanging freely over side of table or chair, or have patient lie supine and support knee in a flexed 90-degree position. Briskly tap patellar tendon just below patella.	Extension of lower leg
Achilles	Have patient assume same position as for patellar reflex. Slightly dorsiflex patient's ankle by grasping toes in palm of your hand. Strike Achilles tendon just above heel at ankle malleolus.	Plantar flexion of foot
Cutaneous Reflexes		
Plantar	Have patient lie supine with legs straight and feet relaxed. Take handle end of reflex hammer and stroke lateral aspect of sole from heel to ball of foot, curving across ball of foot toward big toe.	Plantar flexion of all toes
Gluteal	Have patient assume side-lying position. Spread buttocks apart and lightly stimulate perineal area with cotton applicator.	Contraction of anal sphincter
Abdominal	Have patient stand or lie supine. Stroke abdominal skin with base of cotton applicator over lateral borders of rectus abdominis muscle toward midline. Repeat test in each abdominal quadrant.	Contraction of rectus abdominis muscle with pulling of umbilicus toward stimulated side



Figure 31-75 Position for eliciting the patellar tendon reflex. The lower leg normally extends.

sometimes used to record reflexes. Table 31-39 summarizes common deep tendon and cutaneous reflexes.

After the Examination

Record findings from the physical assessment during the examination or at the end. Special forms are available to record data. Review all findings before assisting the patient with dressing, in case of a need to recheck any information or gather additional data. Integrate physical assessment findings into the plan of care.

After completing the assessment, give the patient time to dress. The hospitalized patient sometimes needs help with hygiene and returning to bed. When the patient is

comfortable, it helps to share a summary of the assessment findings. If the findings have revealed serious abnormalities, such as a mass or highly irregular heart rate, consult the patient's health care provider before revealing any findings. It is the health care provider's responsibility to make definitive medical diagnoses. Explain the type of abnormality found and the need for the health care provider to conduct an additional examination.

When cleaning the examination area, use infection-control practices in removing materials or instruments soiled with potentially infectious wastes. If the patient's bedside was the examination site, clear away soiled items from the bedside table, and make sure that the bed linen is dry and clean. The patient will appreciate a clean gown and the opportunity to wash the face and hands. Afterward, be sure to perform hand hygiene.

Be sure to record a complete assessment. If you delayed entering any items into the assessment form, record them at this time to avoid forgetting any important information. If you made entries periodically during the examination, review them for accuracy and thoroughness. Communicate significant findings to appropriate medical and nursing personnel, either verbally or in the patient's written care plan.

The patient often needs a number of ancillary examinations, such as X-ray examinations, laboratory tests, or ultrasonography, after a physical examination. The tests provide additional screening information to rule out the presence of abnormalities and help in the diagnosis of specific abnormalities found during the examination. Explain the purpose of these tests and the sensations that the patient will experience.

Integration of Physical Assessment With Nursing Care

Learn to integrate an examination during routine patient care. For example, assess the condition of the skin during a

bed bath, or observe a patient's gait, ROM, and balance as the patient ambulates. Assisting with activities of daily living offers an additional opportunity to obtain cognitive assessment data. This practice makes more efficient use of time and decreases anxiety involved in formal physical assessment examinations.

❖ KEY CONCEPTS

- Baseline assessment findings reflect the patient's functional abilities and serve as the basis for comparison with subsequent assessment findings.
- Physical assessment of a child or infant requires the application of the principles of growth and development.
- Recognize that the normal process of aging affects physical findings collected from an older adult.
- Integrate patient teaching throughout the examination to help patients learn about health promotion and disease prevention.
- Inspection requires good lighting, full exposure of the body part, and a careful comparison of the part with its counterpart on the opposite side of the body.
- Palpation involves the use of parts of the hand to detect different types of physical characteristics.
- Use auscultation to assess the character of sounds created in various body organs.
- Perform a physical examination only after proper preparation of the environment and equipment and after preparing the patient physically and psychologically.
- Throughout the examination keep the patient warm, comfortable, and informed of each step of the process.
- A competent examiner is systematic while combining assessment of different body systems simultaneously.
- Information from the history helps to focus on body systems likely to be affected.
- When assessing a seriously ill patient, concentrate on the body systems most likely to be affected.
- Creating a mental image of internal organs in relation to external anatomical landmarks enhances accuracy in assessing the thorax, heart, and abdomen.
- When assessing heart sounds, imagine events occurring during the cardiac cycle.
- Never palpate the carotid arteries simultaneously.
- When examining a woman's breasts, explain the techniques for breast self-examination.
- The abdominal assessment differs from other portions of the examination in that auscultation follows inspection.
- During assessment of the genitalia, explain the technique for genital self-examination.
- Conduct an assessment of musculoskeletal function when observing the patient ambulate or participate in other active movements.
- Assess mental and emotional status by interacting with the patient throughout the examination.
- At the end of the examination, provide for the patient's comfort, and then document a detailed summary of physical assessment findings.

❖ CRITICAL THINKING EXERCISES

You are caring for Mrs. Brown, a 75-year-old woman of First Nations ancestry who underwent repair of right fractured femur attributed to osteoporosis. Mrs. Brown was transferred to your hospital from the health centre in her small rural home community. This is her first postoperative day on your clinical unit. The

night nurse reported that the patient had an "uneventful" night. She has an intravenous line (IV) for fluids and medication, a right hip dressing, a Jackson-Pratt drain, a Foley (urethral) catheter to gravity and is on bed rest.

1. What body systems would you assess for this patient?
 - a. Describe the key elements in these assessments.
2. Upon entrance to the room, you observe that Mrs. Brown appears agitated and confused. How do you further evaluate her mental status? What condition may these symptoms indicate?
3. After you reorient Mrs. Brown, she allows you to continue with your assessment. On auscultation of her posterior lung field bases, you hear a crackling noise on inspiration. What is this sound, and what does it indicate?
4. You next assess her cardiac status. Her apical heart rate is 72 beats per minute, rhythm regular. You interpret this finding as
 - a. Abnormal
 - b. Bradycardia
 - c. Normal
 - d. Tachycardia
5. You are performing neurovascular checks of the lower extremities. Describe how you would evaluate for capillary refill.
6. How will you demonstrate cultural competency in your care and assessment of Mrs. Brown?

❖ REVIEW QUESTIONS

1. The nurse conducts a general survey on an adult patient, which includes
 1. Appearance and behaviour
 2. Measurement of vital signs
 3. Observing specific body systems
 4. Conducting a detailed health history
2. To correctly palpate the patient's skin for temperature, the nurse uses the
 1. Base of the hands
 2. Fingertips of the hands
 3. Dorsal surface of the hands
 4. Palmar surface of the hands
3. To assess a patient's superficial lymph nodes, the nurse
 1. Deeply palpates using the entire hand
 2. Lightly palpates using a bimanual technique
 3. Deeply palpates using a bimanual technique
 4. Gently palpates using the pads of the index and middle fingers
4. The nurse is teaching the patient to inspect all skin surfaces and to report pigmented skin lesions that
 1. Are symmetrical
 2. Are uniform in colour
 3. Have irregular borders
 4. Are less than 6 mm in diameter
5. To auscultate the patient's lung fields, the nurse uses a systematic pattern comparing
 1. Top to bottom
 2. Anterior to posterior
 3. Side to side
 4. Interspace to interspace

6. The patient's respiratory assessment reveals a loud, low-pitched, rumbling coarse sound heard during inspiration and expiration. The nurse interprets these sounds as
 1. Crackles
 2. Normal
 3. Rhonchi
 4. Wheezes
7. While auscultating heart sounds, the nurse documents that S_2 is best heard at the base. This sound (S_2) correlates with closure of the
 1. Aortic and mitral valves
 2. Mitral and tricuspid valves
 3. Aortic and pulmonic valves
 4. Tricuspid and pulmonic valves
8. To assess the patient's dorsalis pedis pulse, the nurse palpates
 1. Behind the knee
 2. Over the lateral malleolus
 3. In the groove behind the medial malleolus
 4. Lateral to the extensor tendon of the great toe
9. To spread breast tissue evenly over the chest wall during an examination, the nurse asks the patient to lie supine with
 1. Both arms overhead with palms upward
 2. Hands clasped just above the umbilicus
 3. The dominant arm straight alongside the body
 4. The ipsilateral arm overhead with a small pillow under the shoulder
10. Place in order the assessment techniques employed during an abdominal examination.
 1. Palpation
 2. Inspection
 3. Percussion
 4. Auscultation
11. The nurse is teaching a patient how to perform a testicular self-examination. The nurse informs the patient:
 1. "The testes are normally round, movable, and have a lumpy consistency."
 2. "Contact your health care provider if you feel a painless pea-sized nodule."
 3. "The best time to do a testicular self-examination is before your bath or shower."
 4. "Perform a testicular self-examination weekly to detect signs of testicular cancer."
12. The patient is being assessed for range of joint movement. You ask the patient to move the arm toward the body, evaluating the movement of
 1. Flexion
 2. Extension
 3. Abduction
 4. Adduction
13. The nurse asks the patient to interpret the saying "Don't count your chickens before they're hatched." The patient's response reveals
 1. Judgement
 2. Knowledge
 3. Association
 4. Abstract reasoning
14. The nurse asks the patient to shrug the shoulders and turn the head side to side against the resistance of the examiner's hand; these actions evaluate cranial nerve number
 1. VII-facial
 2. V-trigeminal
 3. XII-hypoglossal
 4. XI-spinal accessory
15. The nurse recognizes all of the following as common biocultural variations of normal physical exam findings except
 1. Darker skin creases on the body of a patient with a dark complexion
 2. Dry, flaky cerumen in the ear canal of a child of First Nations descent
 3. Elevated blood pressure in an individual of African ancestry
 4. Dark brown areolae in a fair-complexioned woman aged 45 years
16. When positioning a patient who has had a left total hip replacement, the nurse is aware that extra care must be taken if placing the patient in the _____ position.
 1. Lateral recumbent
 2. Lithotomy
 3. Dorsal recumbent
 4. Sims'

✦ RECOMMENDED WEB SITES

Canadian Cancer Society: <http://www.cancer.ca/>

This web site is a source of general information about all types of cancers, including Canadian statistics on the prevalence, mortality and survival rates for specific cancers. Canadian Diabetes Association: <http://www.diabetes.ca/>

The Canadian Diabetes Association web site contains a wealth of resources on diabetes and evidenced-informed guidelines for patient care. The site contains information about risk factors and associated disease processes and conditions.

Canadian Task Force on Preventive Health Care: <http://www.canadiantaskforce.ca/>

The site provides information on health prevention and evidence-informed recommendations. Montreal Cognitive Assessment (Nasreddine 2003-2011): <http://www.mocatest.org/>

This site provides access to the Montreal Cognitive Assessment and research on cognitive impairment.

NurseONE: <http://www.nurseone.ca/>

This web site is a good resource for information about nursing practice in Canada. NurseONE also provides a broad range of resource materials for nurses looking to expand their practice knowledge. Information on nursing student access to NurseONE can be found at the following link: <http://www.cnsa.ca/english/aboutus/faq/what-is-nurseone-and-how-do-i-register>.

Rourke Baby Record: <http://www.rourkebabyrecord.ca/>

The Rourke Baby Record provides information about children's first five years of life. Literature and research that contributed to the development of this tool is linked to the web site. This tool and the web site offer information about pediatric assessment.

Review Question Answers

12. 4; 13. 4; 14. 4; 15. 3; 16. 2
1. 1; 2. 3; 3. 4; 4. 3; 5. 3; 6. 3; 7. 3; 8. 4; 9. 4; 10. 2; 4; 3; 1; 11. 2;

Rationales for the Review Questions appear at the end of the book.

Infection Control

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objectives

Mastery of content in this chapter will enable you to:

- Define the key terms listed.
- Explain the relationship between the chain of infection and the transmission of infection.
- Identify the body's normal defences against infection.
- Discuss the events in the inflammatory response.
- Describe the signs and symptoms of a localized and a systemic infection.
- Identify patients most at risk for infection.
- Explain conditions that promote the transmission of health care-associated infection.
- Explain the difference between medical and surgical asepsis.
- Give an example of preventing infection for each element of the infection chain.
- Perform proper procedures for hand hygiene.
- Explain the rationale and components of routine practices.
- Explain the rationale and practices for additional (isolation) precautions.
- Explain how infection-control measures in the home may differ from those in the hospital.
- Properly don a surgical mask, sterile gown, and sterile gloves.

key terms

- | | |
|--|-------------------------------|
| Aerobic, p. 620 | Isolation precautions, p. 640 |
| Anaerobic, p. 620 | Leukocytosis, p. 624 |
| Asepsis, p. 632 | Localized, p. 622 |
| Broad-spectrum antibiotics, p. 623 | Medical asepsis, p. 632 |
| Carriers, p. 619 | Microorganisms, p. 618 |
| Colonizing, p. 619 | Necrotic, p. 623 |
| Communicable, p. 619 | Normal flora, p. 622 |
| Disinfection, p. 633 | Nosocomial infection, p. 624 |
| Edema, p. 624 | Pathogens, p. 619 |
| Endogenous infection, p. 624 | Pathogenicity, p. 622 |
| Epidemiology, p. 646 | Phagocytosis, p. 624 |
| Exogenous infection, p. 624 | Purulent, p. 624 |
| Exudates, p. 639 | Routine practices, p. 640 |
| Hand hygiene, p. 635 | Sanguineous, p. 624 |
| Handwashing, p. 635 | Serosanguineous, p. 624 |
| Health care-associated infection, p. 624 | Serous, p. 624 |
| Immune response, p. 622 | Sterile field, p. 650 |
| Immunocompromised, p. 619 | Sterilization, p. 633 |
| Inflammatory response, p. 624 | Superinfection, p. 623 |
| Invasive, p. 618 | Surgical asepsis, p. 646 |
| | Susceptibility, p. 622 |
| | Systemic, p. 622 |
| | Virulence, p. 619 |

media resources

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Good health depends in part on a safe environment. Practices or techniques that control or prevent transmission of infection help to create an environment that protects patients and health care workers from disease. Patients in all health care settings are at risk for acquiring infections because they often have lower resistance to infectious **microorganisms** and increased exposure to numbers and types of disease-causing microorganisms, and they sometimes undergo **invasive** procedures wherein a body cavity or organ is entered by either puncture or incision. Microorganisms can only be seen with the aid of a microscope and are typically a single cell. They include bacteria, protozoans, certain types of algae, and fungi. In acute care or ambulatory care facilities,

patients can be exposed to pathogens, some of which may be resistant to most antibiotics. By practising infection prevention and control techniques, you can avoid spreading microorganisms to patients.

In all settings, patients and their families must be able to recognize sources of infections and be able to institute protective measures. Patient teaching should include information concerning infections, modes of transmission, and methods of prevention.

Health care workers can protect themselves from contact with infectious materials or exposure to communicable diseases by having knowledge of the infectious process and appropriate barrier protections. The spread of diseases such as hepatitis B and C, acquired immune deficiency syndrome (AIDS), sudden acute respiratory syndrome (SARS), and tuberculosis have resulted in a greater emphasis on infection control techniques. Infection control has two purposes: (1) protecting patients from acquiring infections and (2) protecting health care workers from becoming infected. Many of the techniques used to protect patients also provide effective protection for nurses. You must remain constantly vigilant to prevent the spread of infection while providing care.

Scientific Knowledge Base

Microorganisms live and grow on inanimate objects and in air, water, food, soil, plants, and animals. They also live and grow in and on people. Most microorganisms are nonpathogens, meaning that they do not cause a person to be ill; however, some are **pathogens**, meaning that they are capable of causing disease. An infection is a disease state resulting from the entry and multiplication of a pathogen in the tissues of a host causing the body to manifest clinical signs and symptoms. If the infection can be transmitted from one person to another, it is a **communicable** (infectious, contagious) disease. Resident skin microorganisms are usually nonpathogenic. However, they can cause serious infection when surgery or other invasive procedures allow them to enter deep tissues, or when a patient is severely **immunocompromised** (has an impaired immune system).

Chain of Infection

The presence of a pathogen does not mean that an infection will begin. The development of an infection occurs in a cycle that depends on the presence of all the following elements:

- An infectious agent (pathogen)
- A reservoir (source for pathogen growth)
- A portal of exit from the reservoir
- A mode of transmission
- A portal of entry to a host
- A susceptible host

An infection develops if this chain remains intact (Figure 32-1). You will follow infection prevention and control practices to break the chain so that infections do not develop.

Infectious Agents. Microorganisms include bacteria, viruses, fungi, and protozoa (Table 32-1). Microorganisms on the skin are called resident or *transient flora*. Resident organisms are considered permanent residents of the skin, where they survive and multiply without causing harm. They are not easily removed by handwashing with plain soaps unless considerable friction is used. Resident microorganisms in deep skin layers are usually killed only by performing hand hygiene with products containing antimicrobial ingredients.

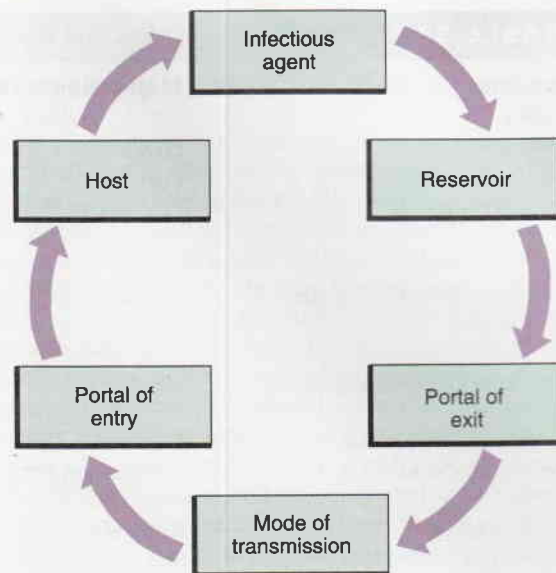


Figure 32-1 Chain of infection.

Transient microorganisms attach to the skin when a person has contact with another person or object. For example, when you touch a bedpan or a contaminated dressing, transient bacteria adhere to your skin. The organisms attach loosely to the skin in dirt and grease and under fingernails. These organisms may be readily transmitted unless removed by handwashing/hand hygiene (Centers for Disease Control and Prevention [CDC], 2007; Wilson, 2006, p. 75).

The potential for microorganisms to cause disease depends on the following factors:

- A sufficient number of organisms
- **Virulence**, or the ability to produce disease
- The ability to enter and survive in the host
- The susceptibility of the host

Reservoir. A reservoir is a place where a pathogen can survive but may or may not multiply. For example, hepatitis A virus survives in shellfish but does not multiply; *Pseudomonas* organisms can survive and multiply in nebulizer reservoirs used in the care of patients with respiratory problems. The most common reservoir is the human body. A variety of microorganisms live on the skin and within body cavities, fluids, and discharges. When a pathogen is present on or in the body but does not cause harm, the pathogen is **colonizing** the site. **Carriers** are animals or persons who show no symptoms of illness but who have pathogens on or in their bodies that can be transferred to others. For example, a person can be a carrier of hepatitis B virus without having any signs or symptoms of infection. Animals, food, water, insects, and even inanimate objects can also be reservoirs for infectious organisms. For example, the bacterium *Legionella pneumophila*, which causes legionnaires' disease, lives in contaminated water and water systems. To thrive, pathogens require a reservoir that provides food, oxygen (or no oxygen, depending on the pathogen), water, an appropriate temperature and pH, and minimal light.

Food. Microorganisms require nourishment. Some—such as *Clostridium perfringens*, the microbe that causes gas gangrene—thrive on organic matter. Others, such as *Escherichia coli*, consume undigested food in the bowel. Carbon dioxide and inorganic materials such as soil provide nourishment for other organisms.

► TABLE 32-1 Common Pathogens and Resulting Major Infections

Organism	Major Reservoir(s)	Major Infections
Bacteria		
<i>Clostridium difficile</i>	Colon	Colitis, diarrhea
<i>Escherichia coli</i>	Colon	Gastroenteritis, urinary tract infection
<i>Staphylococcus aureus</i>	Skin, hair, anterior nares	Wound infection, pneumonia, food poisoning, cellulitis, bacteremia, meningitis, osteomyelitis, septic arthritis
<i>Streptococcus</i> (β -hemolytic group A) organisms	Oropharynx, skin, perianal area	"Strep throat," rheumatic fever, scarlet fever, impetigo, wound infection, glomerulonephritis (Gladwin & Trattler, 2003, p. 23)
<i>Streptococcus</i> (β -hemolytic group B) organisms	Adult genitalia	Urinary tract infection, wound infection, postpartum sepsis, neonatal sepsis
<i>Mycobacterium tuberculosis</i>	Droplet nuclei from lungs	Tuberculosis
<i>Neisseria gonorrhoeae</i>	Genitourinary tract, rectum, mouth	Gonorrhea, pelvic inflammatory disease, infectious arthritis, conjunctivitis
<i>Rickettsia rickettsii</i>	Wood tick	Rocky Mountain spotted fever
<i>Staphylococcus epidermidis</i>	Skin	Wound infection, bacteremia
Viruses		
Hepatitis A virus	Feces	Hepatitis A
Hepatitis B virus	Blood and body fluids	Hepatitis B
Hepatitis C virus	Blood	Hepatitis C
Herpes simplex virus (type 1)	Lesions of mouth or skin, saliva, genitalia	Cold sores, aseptic meningitis, genital herpes, herpetic whitlow
Human immunodeficiency virus	Blood, semen, vaginal secretions, breast milk (has also been isolated in saliva, tears, and urine, but these have not proved to be sources of transmission)	Acquired immune deficiency syndrome
Fungi		
<i>Aspergillus</i> organisms	Soil, dust, construction dust, decaying or organic matter	Sinusitis or skin, lung, wound, or central nervous system infection (Wilson, 2006)
<i>Candida albicans</i>	Mouth, skin, colon, genital tract	Candidiasis, pneumonia, sepsis
Protozoan		
<i>Plasmodium falciparum</i>	Blood	Malaria

Oxygen. Aerobic bacteria require oxygen to survive and to multiply sufficiently to cause disease. Aerobic organisms cause more infections than do **anaerobic** organisms (i.e., organisms that can survive only in the absence of oxygen). Examples of aerobic organisms are *Staphylococcus aureus* and strains of *Streptococcus* organisms.

The gastrointestinal tract is colonized by large numbers of anaerobic bacteria that can cause infections if the bowel is damaged. Infections deep within the pleural cavity, in a joint, or in a deep sinus tract are typically caused by anaerobes. Bacteria that cause tetanus, gas gangrene, and botulism are anaerobes.

Water. Most organisms require water or moisture for survival. For example, microorganisms thrive in the moist drainage from a surgical wound. However, some bacteria assume a form called a *spore*. Spores remain viable even when deprived of water and are resistant to drying. Spore-forming bacteria, such as those that cause anthrax, botulism, and tetanus, can live without water.

Temperature. Microorganisms can live only in certain temperature ranges. The ideal temperature for most pathogens in humans is 35 to 37°C; however, some can survive temperature extremes that would be fatal to humans (Wilson, 2006,

p. 12). Cold temperatures tend to prevent the growth and reproduction of bacteria.

pH. The acidity of an environment determines the viability of microorganisms. Most microorganisms prefer an environment within a pH range of 5 to 8. Bacteria, in particular, thrive in urine with an alkaline pH. Most organisms cannot survive the acidic environment of the stomach. In patients receiving acid-reducing medications (e.g., antacids and histamine 2 blockers), these can cause an overgrowth of gastrointestinal organisms, which can contribute to nosocomial pneumonia (CDC, 2004).

Minimal Light. Microorganisms thrive in dark environments such as those under dressings and within body cavities. Ultraviolet light may be effective in killing certain forms of bacteria (e.g., *Mycobacterium tuberculosis*).

Portal of Exit. After microorganisms find a site in which to grow and multiply, they must find a portal of exit if they are to enter another host and cause disease. A *portal of exit* is the path by which the pathogen leaves the reservoir (Sorrentino, 2009). Exits in the human body include body openings (mouth, nose, rectal, vaginal, and urethral openings; and artificial openings such as those resulting from ostomies), breaks in the skin (a scrape, cut, or other wound), and breaks in the mucous

membranes (the skin in the mouth, eyes, nose, vagina, and rectum). Pathogens are carried through portals of exit by blood, body fluids, excretions, and secretions (e.g., urine, stool, vomitus, saliva, mucus, pus, vaginal discharge, semen, wound drainage, bile, and sputum). For example, pathogens that infect the respiratory tract, such as *M. tuberculosis*, can be released from the body through the mouth and nose when an infected person sneezes, coughs, talks, or even breathes. In patients with artificial airways such as tracheostomy or endotracheal tubes (see Chapter 38), organisms easily exit the respiratory tract through these devices. Similarly, when a patient has a urinary tract infection, microorganisms exit during urination or through urinary diversions such as ileal conduits, urostomies, and suprapubic drains (see Chapter 43).

Modes of Transmission. Microorganisms can be transmitted from the reservoir to the host in many ways. Certain infectious diseases tend to be transmitted more commonly by specific modes (Table 32-2). However, a microorganism may be transmitted by more than one mode. For example, human

chicken pox virus may be spread by the airborne route or through direct contact.

Indirect contact is a major mode of transmission in health care facilities. The health care worker's hands can easily pick up microbes from one person, place, or thing and then transmit them to other people, places, or things. However, almost any object within the environment (e.g., a stethoscope or thermometer) can be a mode of indirect transmission of pathogens. Some organisms, such as *Clostridium difficile*, which can produce spores, can live in hospital environments for months. *C. difficile* can be spread by direct or indirect contact. All health care workers providing direct care (e.g., nurses, physiotherapists, and physicians) or performing diagnostic and support services (e.g., laboratory technicians, respiratory therapists, and dietary workers) must follow practices to minimize the spread of infection. Each group follows procedures for handling equipment and supplies used by a patient. For example, respiratory therapists perform hand hygiene before working with each patient and dispose of contaminated

► TABLE 32-2 Modes of Transmission

Mode of Transmission

Contact Transmission

The transfer of microbes by physical touch; may be by direct contact, indirect contact, or droplet

Direct Contact

Physical skin-to-skin contact between an infected or colonized individual and a susceptible host (e.g., via touching patient)

Indirect Contact

Contact between a susceptible host and a contaminated intermediate object (e.g., via touching soiled linen, equipment, or dressings; transferring pathogens to a patient via hands that are not washed between handling patients)

Droplet Transmission

Large particles (droplets) from the respiratory system of an infected source propelled up to 1 m through the air and deposited onto a susceptible host (e.g., droplets produced via coughing, sneezing, or talking)

Airborne Transmission

Small airborne particles (droplet nuclei) containing microbes remain suspended in the air for long periods of time (e.g., droplets and aerosolized airborne particles produced via coughing and sneezing); air currents transmit these particles long distances (>1 m); susceptible host inhales them

Vehicle Transmission

A single contaminated source (e.g., water, drugs, intravenous fluid, food, equipment) transmits infection to multiple hosts, possibly resulting in an outbreak

Vectorborne Transmission

Insects (fleas, mites, ticks, mosquitoes) or pests (e.g., mice) transmit microbes to humans

Examples of Organisms

Direct: *Clostridium difficile*; methicillin-resistant

Staphylococcus aureus (MRSA); vancomycin-resistant enterococci (VRE)

Indirect: MRSA, VRE; *Pseudomonas*; multidrug-resistant *Acinetobacter*

Droplet: Influenza virus, rubella virus, sudden acute respiratory syndrome

Clostridium difficile; *Staphylococcus*, herpes simplex virus, MRSA, VRE, multidrug-resistant *Acinetobacter*

Clostridium difficile; *Staphylococcus*, respiratory syncytial virus, *Pseudomonas*, MRSA, VRE, multidrug-resistant *Acinetobacter*

Influenza virus, rubella virus, sudden acute respiratory syndrome virus (RSV)

Mycobacterium tuberculosis (causes tuberculosis), varicella-zoster virus; causes chicken pox), measles virus

Pseudomonas (via water, drugs), *Escherichia coli* (via food, water), *Enterobacter cloacae* (via IV fluid), *Salmonella* (via food)

Vibrio cholerae, *Plasmodium falciparum* (causes malaria), West Nile virus, Lyme disease

therapy equipment in a prescribed manner. Certain medical devices and diagnostic procedures provide avenues for the spread of pathogens. Invasive procedures such as cystoscopy (the use of an endoscope to visualize the bladder) facilitate the diagnosis of problems but also increase the risk of infection transmission. Because so many factors can promote the spread of infection to a patient, all health care workers must be conscientious about using infection control practices, such as proper handwashing and ensuring that equipment has been adequately disinfected or sterilized.

Portal of Entry. Organisms can enter the body through the same routes they use to exit (i.e., body openings and breaks in the skin or mucous membranes). For example, organisms enter the body when a needle pierces the skin. As long as the device is in place, more organisms are able to enter the body. In patients with a urinary catheter, any obstruction to the flow of urine allows organisms to travel up the urethra. Factors that reduce the body's defences enhance the chances of pathogens entering the body.

Susceptible Host. Whether a person acquires an infection is related to his or her susceptibility to an infectious agent—**susceptibility** depends on the individual's degree of resistance to a pathogen. Although everyone is constantly in contact with large numbers of microorganisms, an infection does not develop until an individual becomes susceptible to the strength and numbers of microorganisms capable of producing infection. The more virulent an organism is, the greater the likelihood that a person will be susceptible to it. Organisms with resistance to antibiotics are becoming more common in acute care settings—this is believed to be associated with the frequent and sometimes inappropriate use of antibiotics. A person's resistance to an infectious agent may be enhanced by receiving an appropriate vaccine or actually contracting the disease.

Infectious Process

By understanding the chain of infection, you can intervene to prevent infections from developing. If a patient is at risk for acquiring an infection, you should observe for signs and symptoms of infection and take appropriate actions to prevent its spread. Infections follow a progressive course (Box 32-1). The severity of a patient's illness depends on the extent of the infection, the ability of the microorganism to cause disease (**pathogenicity** of the microorganisms), and the susceptibility of the host (patient).

If infection is **localized**, or restricted to a limited area (e.g., a wound infection), proper care controls the spread and minimizes the illness. The patient may experience localized symptoms such as pain and tenderness at the wound site. An infection that affects the entire body instead of just a single organ or part is **systemic** and can be fatal.

The course of an infection influences the level of nursing care provided. You are responsible for properly administering antibiotics and monitoring the response to drug therapy (see Chapter 33). Supportive therapy includes providing adequate nutrition and rest to bolster the patient's defences against the infectious process. The complexity of care depends on body systems affected by the infection.

Regardless of whether an infection is localized or systemic, you play a critical role in minimizing its spread. For example, an organism causing a simple wound infection can spread to involve an intravenous needle-insertion site if you use an improper technique when changing a dressing at this site.

► BOX 32-1 Course of Infection by Stage

Incubation Period

- Interval between the entrance of pathogen into body and the appearance of first symptoms (e.g., in chickenpox, 2 to 3 weeks; in the common cold, 1 to 2 days; in influenza, 1 to 3 days; in mumps, 15 to 18 days).

Prodromal Stage

- Interval from the onset of nonspecific signs and symptoms (malaise, low-grade fever, and fatigue) to more specific symptoms (during this time, microorganisms grow and multiply and the patient may be more capable of spreading disease to others).

Illness Stage

- Interval when the patient manifests signs and symptoms specific to type of infection (e.g., the common cold is manifested by a sore throat, sinus congestion, and rhinitis; mumps is manifested by an earache, a high fever, and parotid and salivary gland swelling).

Convalescence

- Interval when the acute symptoms of infection disappear and the body tries to replenish its resources and return to a state of homeostasis; the length of recovery depends on the severity of the infection and the patient's general state of health (may take several days to months).

Nurses who have breaks in their own skin can also acquire infections from patients if their techniques for controlling infection transmission are inadequate.

Defences Against Infection

The body has several mechanisms that protect it against infection. Normal body flora that reside inside and outside the body protect a person from several pathogens. Each organ system has defence mechanisms that fight infectious microorganisms. The **immune response** is a protective reaction that neutralizes pathogens and repairs body cells. The immune system is composed of cells and molecules that help the body resist disease; certain responses of the immune system are nonspecific and protect against microorganisms regardless of prior exposure (e.g., normal flora, body system defences, and inflammation), whereas others are specific defences against particular pathogens. If any of the body's defences fail, an infection can quickly progress to a serious health problem.

Normal Flora. The body normally contains microorganisms that reside on the surface and in deep layers of skin, in the saliva and oral mucosa, and in the gastrointestinal and genitourinary tracts. A person normally excretes trillions of microbes daily through the intestines. The skin also has a large population of resident flora—these **normal flora** do not typically cause disease when residing in their usual area of the body but, instead, participate in maintaining health.

Normal flora of the large intestine exist in great numbers without causing injury. They also secrete antibacterial substances within the intestine's walls. The skin's normal flora exert a protective action by inhibiting the multiplication of organisms landing on the skin. The mouth and pharynx are also protected by flora that impair the growth of invading microbes. The mass of normal flora maintains a sensitive balance with other microorganisms to prevent infection. Any

factor that disrupts this balance places a person at increased risk for acquiring an infectious disease. For example, according to studies, when a patient acquires microorganisms within the hospital, the person's resident flora change, which may lead to an infection (Bryant & Nix, 2007, pp. 45–48).

In addition, the use of **broad-spectrum antibiotics** for the treatment of infection can lead to a **superinfection**, which develops when broad-spectrum antibiotics eliminate a wide range of microorganisms, not just those causing infection. Normal bacterial flora are eliminated, reducing the body's defences and, thus, allowing disease-producing microorganisms to multiply (Siegel et al., 2007).

Body System Defences. A number of the body's organ systems have unique defences against infection (Table 32-3). The skin, respiratory tract, and gastrointestinal tract are easily accessible to microorganisms: pathogenic organisms easily adhere to the skin's surface, are inhaled into the lungs, or are ingested with food. Each organ system has defence mechanisms

physiologically suited to its structure and function. For example, the lungs cannot completely control the entrance of microorganisms; however, the airways are lined with hairlike projections (cilia) that rhythmically beat to move a blanket of mucus and adherent or trapped organisms up to the pharynx to be removed. Conditions that impair an organ's specialized defences increase the person's susceptibility to infection.

Inflammation. Inflammation is the body's cellular response to injury or infection. Inflammation is a protective vascular reaction that delivers fluid, blood products, and nutrients to interstitial tissues in an area of injury. The process neutralizes and eliminates pathogens or **necrotic** (dead) tissues and establishes a means of repairing body cells and tissues. Signs of localized inflammation are swelling, redness, heat, pain or tenderness, and loss of function in the affected body part. When infection becomes systemic, other signs and symptoms develop, including fever, leukocytosis, malaise, anorexia, nausea, vomiting, and lymph node enlargement.

► **TABLE 32-3** Normal Defence Mechanisms Against Infection

Defence Mechanisms	Action	Factors That May Alter Defence
Skin		
Intact multilayered surface (body's first line of defence against infection)	Provides barrier to microorganisms and antibacterial activity	Cuts, abrasions, wounds, areas of maceration (softening of the skin due to moisture), burns, or penetration by invasive devices
Shedding of outer layer of skin cells	Removes organisms that adhere to skin's outer layers	Failure to bathe regularly
Sebum	Contains fatty acid that kills some bacteria	Excessive bathing
Mouth		
Intact multilayered mucosa	Provides mechanical barrier to microorganisms	Lacerations, trauma, extracted teeth
Saliva	Washes away particles containing microorganisms, contains microbial inhibitors (e.g., lysozyme)	Poor oral hygiene, dehydration
Eye		
Tearing and blinking	Blinking prevents entry of particles containing pathogens, and tearing helps to wash particles away	Injury
Respiratory Tract		
Cilia lining upper airway, coated with mucus	Trap inhaled microbes and sweep them outward in mucus to be expectorated or swallowed	Smoking, high concentration of oxygen and carbon dioxide, decreased humidity, cold air
Macrophages	Engulf and destroy microorganisms that reach the lung's alveoli	Smoking
Urinary Tract		
Flushing action of urine flow	Washes away microorganisms on lining of bladder and urethra	Obstruction to normal flow by urinary catheter placement, obstruction from growth or tumour, delayed micturition
Intact multilayered epithelium	Provides barrier to microorganisms	Introduction of urinary catheter, continual movement of catheter in urethra
Gastrointestinal Tract		
Acidity of gastric secretions	Acids destroy some microorganisms	Administration of antacids to neutralize acids
Increased peristalsis in small intestine	Prevents retention of bacterial contents	Delayed motility resulting from impaction of fecal contents in large bowel or mechanical obstruction by masses
Vagina		
At puberty, normal flora causing vaginal secretions to achieve low pH	Inhibit growth of many microorganisms	Use of antibiotics or oral contraceptives, which disrupt normal flora

The **inflammatory response** may be triggered by physical agents, chemical agents, or microorganisms. Mechanical trauma, temperature extremes, and radiation are examples of physical agents. Chemical agents include external and internal irritants such as harsh poisons and gastric acid.

After tissues are injured, the inflammatory response, a series of well-coordinated events, occurs:

- Vascular and cellular responses
- The formation of inflammatory **exudates** (fluid and cells that are discharged from cells or blood vessels, e.g., pus or serum)
- Tissue repair

Vascular and Cellular Responses. Acute inflammation is an immediate response to cellular injury. Arterioles supplying the infected or injured area dilate, allowing more blood into the local circulation. The increase in local blood flow causes the characteristic redness of inflammation. The symptom of localized warmth results from a greater volume of blood at the inflammatory site. Local vasodilation enables blood and white blood cells (WBCs) to travel to the injured tissues.

Injury causes tissue necrosis, and, as a result, the body releases histamine, bradykinin, prostaglandin, and serotonin. These chemical mediators increase the permeability of small blood vessels, allowing fluid, protein, and cells to enter interstitial spaces. Accumulated fluid appears as localized swelling (**edema**).

Another symptom of inflammation is pain—the swelling of inflamed tissues increases the pressure on nerve endings, causing pain. Chemical substances such as histamine stimulate nerve endings. As a result of physiological changes occurring with inflammation, the involved body part usually undergoes a temporary loss of function. For example, a localized infection of the hand causes the fingers to become swollen, painful, and discoloured. Joints may become stiff as a result of the swelling, but the function of the fingers returns when inflammation subsides.

The cellular response of inflammation involves WBCs arriving at the site. These cells pass through the blood vessels and into the tissues. Through the process of **phagocytosis**, specialized WBCs, called *neutrophils* and *monocytes*, ingest and destroy microorganisms and other small particles. As inflammation becomes systemic, other signs and symptoms develop. **Leukocytosis**, or an increase in the number of circulating WBCs, is the body's response to WBCs leaving blood vessels. A serum WBC count is normally 5000/mm³ to 10,000/mm³ but may rise to 15,000/mm³ or even higher during inflammation. Fever is caused by the phagocytic release of pyrogens from bacterial cells that cause a rise in the hypothalamic set point (see Chapter 30).

Inflammatory Exudates. The accumulation of fluid, dead tissue cells, and WBCs forms an exudate at the site of inflammation (see Chapter 46). The exudate may be **serous** (clear, watery plasma), **sanguineous** (bloody drainage), **serosanguineous** (thin, watery drainage that is blood tinged), or **purulent** (thick drainage that contains pus). Eventually, the exudate is cleared away through lymphatic drainage. Platelets and plasma proteins such as fibrinogen form a mesh-like matrix at the site of inflammation to prevent the spread of infection.

Tissue Repair. When tissues are injured, healing involves the inflammation, proliferation, and remodelling stages (see Chapter 46). Damaged cells are eventually replaced with healthy new ones, which undergo a gradual maturation until

they take on the same structural characteristics and appearance as the previous cells. However, unless a wound is minor, the healed wound does not usually have the tensile strength of the tissue it replaces and scarring may occur.

Health Care-Associated Infections

Patients in health care settings have an increased risk of acquiring infections. A **health care-associated infection** (HAI), also known as **nosocomial infection** or *iatrogenic infection*, is an infection acquired after admission to a health care facility that was not present or incubating at the time of admission. Patients in hospitals are at risk for infections because they may have a high acuity of illness and frequently undergo aggressive treatments, many of which compromise immunity (CDC, 2007). Transmission of antibiotic-resistant organisms also can occur in health care facilities because a large population of susceptible people who frequently receive antibiotics are in close proximity to each other.

Clostridium difficile infection (CDI) is one of the most common and costly HAIs. *C. difficile* is a Gram positive, spore-forming, anaerobic bacillus that produces two toxins, A and B, which cause diarrhea and colitis in patients whose bacterial flora have been disrupted by prior antibiotic use. Pseudomembranous colitis (PMC) is a more severe form of CDI, in which patients have a colitis characterized by the presence of pseudomembranes on the colon surface seen during endoscopy. Infection control measures to prevent transmission of *C. difficile* to patients include placing the patient on contact isolation, good hand hygiene (usually with soap and water for patients who have diarrhea), gloves and gowns, as well as thorough environmental cleaning. Another important preventative measure is good antibiotic stewardship.

Health care-associated infections can result from a diagnostic or therapeutic procedure, such as a urinary tract infection that develops after catheter insertion. The incidence of nosocomial infections can be reduced if you use critical thinking when practising aseptic techniques. You should always consider the patient's risks for infection and anticipate how the approach to care may increase or decrease the chances of infection transmission (Box 32-2).

HAIs may be exogenous or endogenous. An **exogenous infection** arises from microorganisms external to the individual that do not exist as normal flora; examples are *Salmonella* organisms and *Clostridium tetani*. An **endogenous infection** can occur when some of the patient's flora become altered and overgrowth results. Examples are infections caused by enterococci, yeasts, and streptococci. When sufficient numbers of microorganisms normally found in one body cavity or lining are transferred to another body site, an endogenous infection develops. For example, the transmission of enterococci, normally found in fecal material, from the hands to the skin is a common cause of wound infections. The number of microorganisms needed to cause an infection depends on the virulence of the organism, the host's susceptibility, and the site affected.

A patient's risk of infection is influenced by the number of health care workers having direct contact with the patient, the type and number of invasive procedures, the therapy received, and the length of hospitalization. Major sites for HAI are surgical and traumatic wounds, urinary and respiratory tracts, and the bloodstream (Box 32-3).

Older adults have an increased susceptibility to HAIs because they are more likely to have a chronic disease and

► BOX 32-2 NURSING CARE PLAN

Perils of Central Venous Catheters

Assessment

Susan Serious is a 48-year-old woman in end-stage renal failure secondary to focal segmental glomerulosclerosis, diagnosed two months previously. She is dialysis dependent, which required the insertion of a central venous catheter. Susan was admitted to the nephrology service on Friday evening from the emergency department with complaints of chills, nausea, vomiting, headache, and fatigue. She stated that she had felt well until the end of her dialysis treatment that day.

Susan related that she is allergic to co-trimoxazole (Bactrim). Her medication list is composed of amlodipine (Norvasc), ramipril (Altace), furosemide (Lasix), prednisone, calcium carbonate, multivitamins (Replavite), iron dextran, and darbepoetin alpha (Aranesp).

Assessment Activities

Review signs and symptoms of localized and systemic infections.

Findings and Defining Characteristics

Signs of localized infection include swelling, redness, heat, pain, or tenderness and loss of function in the affected body part.

Signs and symptoms of systemic infection include fever, leukocytosis, malaise, anorexia, nausea, vomiting, and lymph node enlargement.

Research susceptibility to infection in patients with end-stage renal failure.

The literature shows that infections are a significant cause of morbidity and mortality in patients with end-stage renal failure in part due to the clinical setting where treatment is received, the type of dialysis access, and the use of immunosuppressive medications (Berman et al., 2004). Susan has been taking prednisone 30 mg daily.

Review effects of medications.

Prednisone suppresses the body's response to infection.

Nursing Diagnosis: Risk for infection related to disease, immunosuppressive medications, and the use of a central venous catheter.

Planning

Goals

Susan will be treated for infection and will remain free of future infections.

Expected Outcomes

Follow up results of chest radiographs, complete blood count with differential, and blood cultures with attending nephrologist to diagnose and treat existing infection.

Initiate IV antibiotics, as ordered, to treat existing infection.

Arrange to have the tunneled central venous catheter removed for 48 hours while receiving antibiotics as ordered, to eliminate the source of infection. After 48 hours, the catheter may be reinserted using sterile technique.

Susan will recover from existing infection and will not develop signs or symptoms of new infections.

Susan will become knowledgeable of infection risks.

Susan will self-monitor for signs and symptoms of infection, report these to health care providers, and will observe for good aseptic technique during catheter care by the health care providers. Review the use and dosage of prednisone with Susan to increase her understanding of immunosuppressive medications.

Interventions

Prevention and Early Detection

Monitor Susan's temperature and vital signs, and inspect the central venous catheter exit site for evidence of infection.

Rationale

Interventions are designed to prevent and ensure early detection of infection.

Practise hand hygiene before and after catheter care.

Handwashing reduces bacterial counts on hands (CDC, 2007; Health Canada, 2007).

Teach Susan to perform hand hygiene.

Teach Susan about her catheter: aseptic technique, infection rates, care, and indications of infection.

Increased knowledge will aid in the early detection of infection.

Teach Susan about her medications, indications, side effects, and dosages.

Increased knowledge will increase adherence to the medication regimen and reporting of any related issues.

Evaluation

Nursing Actions

Compare Susan's temperature, vital signs, and physical findings with baseline data.

Patient Response and Finding

Susan remains afebrile, free of signs and symptoms of infection.

Achievement of Outcome

Susan has no active infection at this time.

Ask Susan to review knowledge of catheter-related infections.

Susan is able to identify signs and symptoms of catheter-related infections.

Susan has demonstrated a good knowledge base of catheter-related infections.

Continued

► BOX 32-2 NURSING CARE PLAN—cont'd

Nursing Actions	Patient Response and Finding	Achievement of Outcome
Ask Susan to explain the importance of hand hygiene related to catheter care.	Susan is able to relate that hand hygiene eliminates microorganisms that may contribute to infections.	Susan understands the principles and rationale of hand hygiene.
Ask Susan to discuss central venous catheters and the use of aseptic technique during care of the catheters.	Susan is able to describe aseptic technique during catheter care.	Susan has demonstrated knowledge of catheter care.
Ask Susan to review the medications she is currently using.	Susan is able to list and explain the use of her current medications.	Susan has demonstrated an understanding of her medications regarding their use, effects, and potential concerns.

► BOX 32-3

Sites for and Causes of Health Care-Associated Infections

Surgical and Traumatic Wounds

Improper skin preparation (shaving and bathing) before surgery
 Failure to cleanse skin surface properly
 Failure to use aseptic technique during dressing changes
 The use of contaminated antiseptic solutions
 Improper hand hygiene

Urinary Tract

Inappropriate and unsterile catheterization techniques
 Inadequate monitoring of in-dwelling urinary catheters
 Obstruction or blockages in tubing
 An improper specimen-collection technique
 Urine in the catheter or drainage tube being allowed to re-enter bladder (reflux)
 Improper hand hygiene

Respiratory Tract

Contaminated respiratory therapy equipment
 Failure to use aseptic technique while suctioning airway
 Improper disposal of secretions
 Improper hand hygiene

Bloodstream

Contamination of intravenous fluids by tubing or needle changes
 The insertion of drug additives to intravenous fluid
 The addition of a connecting tube or stopcocks to an intravenous system
 Improper care of a needle-insertion site
 Improper insertion technique
 Contaminated needles or catheters
 Failure to change the intravenous access site when inflammation first appears
 Improper technique during the administration of multiple blood products
 Improper care of peritoneal or hemodialysis catheters
 Improper handwashing and hand hygiene

* BOX 32-4

FOCUS ON OLDER ADULTS

- An age-related decline in immune system function, termed *immune senescence*, increases the body's susceptibility to infection and lessens the strength of the overall immune response (Freid, 2009).
- Age-related changes alter the response to infection resulting in atypical signs and symptoms.
- Chronic disease, prevalent among older adults, allows infectious agents to readily invade; hospitalization and institutionalization as a result of chronic disease also increase older adults' exposure to pathogens (Freid, 2009).
- Risks associated with the development of infections in older patients include poor nutrition, unintentional weight loss, and low serum albumin levels (Wells & Dumbrell, 2006).
- Age-related changes in immunity contribute to the increased risk for acquiring pneumonia and influenza in older adulthood, both of which have significant age-related increases in mortality rates (Freid, 2009).
- Older adults present with an altered response to infection with atypical signs and symptoms such as confusion.



Data from Freid, L. P. (2009). Epidemiology of aging: Implications of the aging society. In Goldman, L., & Ausiello, D. (Eds.), *Cecil essentials of medicine* (23rd ed., pp. 112–136). Philadelphia, PA: Lippincott; Saunders.

Nursing Process in Infection Control

◆ Assessment

When considering infection prevention, you must assess a patient's defence mechanisms, susceptibility, and knowledge of infections. A review of disease history with the patient and family may reveal an exposure to a communicable disease. A thorough review of the patient's clinical condition may allow you to detect signs and symptoms of an infection or a risk for infection. Information about the patient's defences against infection can be determined by an analysis of laboratory findings. By knowing the factors that increase susceptibility or risk for infection, you are better able to plan preventive therapy that includes aseptic techniques. Recognizing early signs and symptoms of infection allows you to alert others on the health care team to the potential need for therapy and to initiate supportive nursing measures.

because of the effects of the aging process itself (Box 32-4). Extended stays in health care institutions, increased disability, and prolonged recovery times are all potential outcomes of HAIs. HAIs decrease the patient's quality of life and increase costs to the health care system. Therefore, their prevention is an important part of managed care.

► BOX 32-5 Risk Factors for Infection

Inadequate Primary Defences

- Broken skin or mucosa
- Traumatized tissue
- Decreased ciliary action
- Obstructed urine outflow
- Altered peristalsis
- A change in the pH of secretions
- Decreased mobility

Inadequate Secondary Defences

- A reduced hemoglobin level
- The suppression of WBCs (drug or disease related)
- A suppressed inflammatory response (drug or disease related)
- A low WBC count (leukopenia)

Status of Defence Mechanisms

You can determine the status of the patient's normal defence mechanisms against infection through a review of the physical assessment findings and the patient's medical condition. For example, any break in the skin or mucosa is a potential site for infection. Similarly, a chronic smoker is at greater risk for acquiring a respiratory tract infection after general surgery because the cilia of the lung are less likely to propel retained mucus from the lung's airways. Any reduction in the body's primary or secondary defences against infection places a patient at risk (Box 32-5).

Patient Susceptibility

Many factors influence susceptibility to infection. You will gather information about each factor through the patient's and family's history.

Age. Throughout the lifespan, susceptibility to infection changes. An infant has immature defences against infection. Born with only the antibodies provided by the mother, the infant's immune system is incapable of producing the necessary immunoglobulins and WBCs to adequately fight some infections. However, breastfed infants have greater immunity than do bottle-fed infants because they receive the mother's antibodies through the breast milk. As the child grows, the immune system matures; however, the child is still susceptible to organisms that cause the common cold, intestinal infections, and, if the child is not vaccinated, infectious diseases such as mumps and measles.

The young or middle-aged adult has refined defences against infection. Normal flora, body system defences, inflammation, and the immune response provide protection against invading microorganisms. Viruses are the most common cause of infectious illness in young and middle-aged adults.

Defences against infection change with aging (Freid, 2009). The immune response, particularly cell-mediated immunity, declines. Older adults also undergo alterations in the structure and function of the skin, urinary tract, and lungs. For example, the skin loses its turgor and the epithelium thins; as a result, the skin is more easily abraded or torn. This increases the potential for invasion by pathogens (Table 32-4).

Nutritional Status. When protein intake is inadequate as a result of poor diet or debilitating disease, the rate of protein breakdown exceeds that of tissue synthesis (see Chapter 42). A reduction in the intake of protein and other

nutrients such as carbohydrates and fats reduces the body's defences against infection and impairs wound healing (see Chapter 42). Patients with illnesses or problems that increase protein requirements are at further risk. These problems include traumatic injury, extensive burns, and conditions causing fever. Patients who have had surgery also require increased protein.

You need to assess patients' dietary intake and ability to tolerate solid foods. Patients who have difficulty with swallowing, who experience alterations in digestion, or who are too confused or weak to feed themselves are at risk for inadequate dietary intake. A dietitian may be called in to assess the nutritional adequacy of a patient's diet. When preparing a patient for discharge, you should evaluate the patient's and family's understanding of nutritional needs.

Stress. The general adaptation syndrome is the body's response to emotional or physical stress (see Chapter 29). During the alarm stage, the basal metabolic rate increases as the body uses energy stores. Adrenocorticotrophic hormone acts to increase serum glucose levels and decrease unnecessary anti-inflammatory responses through the release of cortisone. If stress continues or becomes intense, elevated cortisone levels result in a decreased resistance to infection. Continued stress leads to exhaustion, wherein energy stores are depleted and the body has no resistance to invading organisms. The same conditions that increase nutritional requirements, such as surgery or trauma, also increase physiological stress.

Disease Process. Patients with diseases of the immune system are at particular risk for infection. Leukemia, AIDS, lymphoma, and aplastic anemia are conditions that compromise a host by weakening defences against infectious organisms. Patients with leukemia, for example, are unable to produce normal WBCs to effectively ward off infection.

Patients with chronic diseases such as diabetes mellitus and multiple sclerosis are also more susceptible to infection because of general debilitation and nutritional impairment. Cancer (which alters the immune response), peripheral vascular disease (which reduces blood flow to injured tissues), and diseases that impair body system defences, such as emphysema and bronchitis (which impair ciliary action and thicken mucus), increase susceptibility to infection. Patients with burns have a very high susceptibility to infection because of the damage to skin surfaces. The greater the depth and extent of the burns, the higher the risk for infection.

Medical Therapy. Some drugs and medical therapies compromise immunity to infection. You will need to assess your patients' history to determine whether they take medications at home that increase infection susceptibility. A review of therapies received within the health care setting may further reveal risks. Adrenal corticosteroids, prescribed for several conditions, are anti-inflammatory drugs that cause protein breakdown and impair the inflammatory response against bacteria and other pathogens. Cytotoxic or antineoplastic drugs attack cancer cells but cause side effects such as depression of bone marrow activity and normal cell toxicity. When bone marrow activity is depressed, the body is unable to produce lymphocytes and sufficient WBCs. When normal cells become altered by antineoplastic agents, cellular defences against infection fail. Cyclosporine and other immunosuppressant drugs, which decrease the body's immune response, are commonly taken by organ transplant recipients. The immunosuppressants prevent organ and tissue rejection, but they also increase the recipients' susceptibility to infection.

► **TABLE 32-4** Assessing the Risk of Infection in Older Adults

Component	Possible Changes With Age	Possible Outcomes
Skin	Thinner dermal and epidermal layers, decreased collagen strength, decreased skin elasticity, decreased sweating	Pressure ulcers
Peripheral nerves	Reduced sensitivity, particularly in patients with a history of alcohol abuse, vitamin B ₁₂ deficiency, and diabetes mellitus	Pressure ulcers, patients unaware of trauma to skin, leading to infection
Circulation	Heart failure, calcified mitral and aortic valves	Pneumonia, bacterial endocarditis
Peripheral circulation	Loss of elasticity of veins (prone to distension), less effective venous valves, blood pooling in lower extremities	Venous stasis ulcers
Mouth	Dehydration, reduction in saliva production, functional inability to maintain oral hygiene	Parotid gland infection, periodontal disease, localized abscess, bacteremia (i.e., bacteria in the blood)
Gastrointestinal tract	Loss of ability to secrete stomach acid in 30% of persons older than 70 years	<i>Salmonella</i> diarrhea
Pulmonary system	Increased colonization of oropharynx, impaired mucociliary clearance, decreased macrophage function, decreased cough reflex	Viral and bacterial pneumonia
Genitourinary tract	Prostatic hypertrophy or hyperplasia, urethral strictures, age-related hormonal changes in vaginal wall, pelvic floor relaxation, ureterocele or cystocele, degeneration of nerves leading to neurogenic bladder, use of tricyclic antidepressants result in urinary retention, dehydration	Asymptomatic bacteriuria (i.e., bacteria in the urine), cystitis, pyelonephritis
Nutrition	Malnutrition, vitamin deficiency (vitamin A, vitamin C, pyridoxine, and riboflavin), protein and caloric deficiencies	Impaired immune response to infection
Drug therapy	Corticosteroid and cytotoxic drugs	Impaired immune response to infection in patients already at risk for decline in immune system function
Long-term care residency	Surveys indicate as many as 15% of residents living in long-term care facilities have an infection at any one time. The elderly population and the health care setting may provide a setting that promotes the development and spread of infections. Preventive measures should be instituted such as increased hand hygiene, reduced use of indwelling catheters, increased efforts to reduce aspiration, increased administration of vaccines, and prudent use of antibiotics	Frequent serious infection, increased risk of pneumonia and urinary tract infections. Increased risk of acquiring a multidrug-resistant organism

Reference: Carrico, R. (Ed.). (2009). *APIC text of infection control and epidemiology* (3rd edition, pp. 401–406). Washington, DC: Association for Professionals in Infection Control and Epidemiology (APIC).

Patients with cancer who are receiving radiotherapy are at risk for infection. The massive doses of radiation that destroy cancerous cells can also depress bone marrow activity and destroy normal cells.

Clinical Appearance

The signs and symptoms of infection may be local or systemic. Localized infections are most common in areas of skin or mucous membrane breakdown, such as surgical and traumatic wounds, pressure ulcers, and mouth lesions. Infections also develop locally in cavities beneath the skin; an example is an abscess.

To assess an area for localized infection, you should first inspect the area for redness and swelling caused by inflammation. Because drainage from open lesions or wounds may occur, you must wear disposable gloves. Infected drainage may be yellow, green, or brown, depending on the pathogen. Ask the patient about pain or tenderness around the site. The patient may complain of tightness and pain caused by edema. If the infected area is large enough, movement of a body part may be restricted. Gentle palpation of an infected area usually results in some degree of tenderness.

Systemic infections cause more generalized symptoms than do local infections. Systemic infections usually result in fever, fatigue, and malaise. Lymph nodes that drain the area of

infection often become enlarged, swollen, and tender during palpation. For example, an abscess in the peritoneal cavity may cause the enlargement of the lymph nodes in the groin. An infection of the upper respiratory tract may cause cervical lymph node enlargement. If an infection is serious and widespread, all major lymph nodes may enlarge. Systemic infections commonly cause a loss of appetite, nausea, and vomiting.

Systemic infections may develop after treatment for a localized infection has failed. You should be alert for changes in a patient's level of activity and responsiveness. As systemic infections develop, the patient may become lethargic and complain of a loss of energy. An elevation in body temperature may lead to episodes of increased heart and respiratory rates and low blood pressure. The involvement of major body systems may produce specific signs. For example, a pulmonary infection may result in a productive cough with purulent sputum. A urinary tract infection may result in cloudy, foul-smelling urine.

In older adults, infection may not present with typical signs and symptoms. Fever, pain, and swelling are often absent in older adults because they tend to have lower body temperatures, decreased pain sensation, and less immune response to infection. As a result, in older adults, infection is often advanced before it is identified. Atypical symptoms such as a change in

behaviour (e.g., new or increased confusion, incontinence, or agitation) may be the only symptoms of an infectious illness (Freid, 2009). For example, as many as 20% of older adults with pneumonia do not have the typical signs and symptoms of fever, shaking, chills, and “rusty” productive sputum. The only symptoms present may be an increased heart rate with no apparent reason, confusion, or generalized fatigue.

Laboratory Data

A review of laboratory test results may confirm infection (Table 32-5). However, laboratory values alone are not sufficient to detect infection; other clinical signs must be assessed. Factors other than infection may alter test values. For example, trauma and physical stress can cause an elevation in the number of neutrophils. A culture may show the growth of an organism in the absence of overt signs of infection.

Patients With Infection

A patient with infection may have a variety of health problems. You need to assess ways that the infection affects the patient’s and family’s needs—these may be physical, psychological, social, or economic. For example, a patient with a chronic

disease such as AIDS may experience serious psychological problems as a result of self-imposed isolation or rejection by family and friends. Using a case-management approach, you can determine the patient’s and family’s ability to adjust to the disease and the resources available to help them manage health care challenges (Cheever, 2007).

❖ Nursing Diagnosis

During assessment, you gather objective findings, such as an open incision or a reduced caloric intake, and subjective data, such as a patient’s complaint of tenderness over a surgical wound site (Box 32-6). You then interpret the data carefully, looking for clusters of defining characteristics or risk factors that create a pattern suggesting a specific nursing diagnosis. The following are examples of nursing diagnoses that may apply:

- *Disturbed body image*
- *Risk for infection*
- *Risk for injury*
- *Imbalanced nutrition—less than body requirements*
- *Impaired oral mucous membrane*

► **TABLE 32-5** Laboratory Tests to Screen for Infection

Laboratory Value	Normal (Adult) Values	Indication of Infection
White blood cell (WBC) count	5–10 × 10 ⁹ /L	Increased in acute infection, neoplasm, allergy, neoplasm, or immunosuppression, decreased in certain viral or overwhelming infections
Erythrocyte sedimentation rate (ESR) Westergren method	Up to 15 mm/hour for men and 20 mm/hour for women	Elevated in presence of inflammatory process, acute and chronic infection, tissue necrosis or infarction
Iron level	8–25 mcml/L	Decreased in chronic infection
C-reactive protein	<10 mg/L	An acute phase reactant protein that is elevated in the presence of an acute inflammatory process
Cultures of urine and blood	Normally sterile, without microorganism growth	Presence of infectious microorganism growth
Cultures and Gram stain of wound, sputum, and throat	No WBCs on Gram stain, possible normal flora	Presence of infectious microorganism growth and WBCs on Gram stain
WBC	Differential Count (Percentage of Each Type of WBC)	Indication of Infection
Neutrophils	55%–70%	Increased in acute suppurative infection, decreased in overwhelming bacterial infection (older adult)
Lymphocytes	20%–40%	Increased in chronic bacterial and viral infection, decreased in sepsis
Monocytes	2%–8%	Increased in protozoal, rickettsial, and tuberculosis infections
Eosinophils	1%–4%	Increased in parasitic infection
Basophils	0.5%–1%	Normal during infection

Data from Pagana, K. D., & Pagana, T. J. (2010). *Mosby’s manual of diagnostics and laboratory tests* (4th ed.) St Louis, MO: Mosby/Elsevier.

► BOX 32-6 NURSING DIAGNOSTIC PROCESS

Assessment Activities	Defining Characteristics	Nursing Diagnosis
Check results of laboratory tests.	WBC count 3.9 × 10 ⁹ /L	<i>Risk for infection related to neutropenia.</i>
Review current medications.	Patient receiving azathioprine (Imuran), an immunosuppressant	
Identify potential sites of infection.	Intravenous catheter in right forearm in place for 3 days Foley catheter draining amber-coloured urine	

- Risk for impaired skin integrity
- Social isolation
- Impaired tissue integrity

It may be necessary for you to validate data (e.g., by inspecting the integrity of a wound more carefully). Likewise, additional data such as laboratory findings may be helpful. The proper selection of appropriate nursing diagnoses depends on the correct analysis and organization of data.

The diagnosis must have the correct etiological factor for you to establish an appropriate and well-thought-out plan. For example, minimizing the risk for infection related to broken skin requires good hygiene measures and wound care; minimizing the risk for infection related to malnutrition requires good nutritional support and fluid balance.

You may diagnose a risk for infection or make diagnoses that result from the effects of infection on the patient's health status. Your success in planning appropriate nursing interventions depends on the accuracy of the diagnosis and your ability to meet the patient's needs.

❖ Planning

Goals and Outcomes

The patient's care plan is based on each nursing diagnosis and related factors (Box 32-7). You develop a plan that sets attainable outcomes so that interventions are purposeful and directed. If you are caring for a patient with the nursing diagnosis *risk for infection related to broken skin*, you must implement skin and wound care measures to promote healing. The expected outcomes "reduction in wound size by 1 cm" and "absence of drainage" represent targets for measuring the patient's improvement. Once outcomes are met, the goal of "skin intact and without drainage" can be reached. Interventions are selected in collaboration with the patient, the family, and others on the health care team. You direct the care in the acute care setting; care may also involve other professionals in assisting with instructions on post-discharge procedures. Common goals of care relating to infection include the following:

► BOX 32-7 NURSING CARE PLAN

Risk for Infection

Assessment

Mrs. Spicer was admitted to the medical nursing unit three days ago with a diagnosis of lymphoma. She received her first dose of multiagent chemotherapy yesterday. Jess Ralston is the student nurse caring for Mrs. Spicer. He begins his shift by conducting a focused assessment.

Assessment Activities

Review patient's chart for laboratory data reflecting immune function.

Findings and Defining Characteristics

Data show a reduction in number of WBCs (leukopenia).

Ask patient to describe appetite and review food intake for past 24 hours. Weigh patient. Measure height.

Mrs. Spicer reports she has not had an interest in eating for a couple of weeks. She has lost approximately 2.5 kg. Her current weight is 57 kg, and her height is 170 cm. Her food intake yesterday consisted of a small cup of applesauce, a half bowl of soup, some crackers, and two glasses of juice. Mrs. Spicer states, "I get full easily and lose interest in food."

Palpate patient's cervical and clavicular lymph nodes.

Lymph nodes are enlarged and painless.

Review effects of chemotherapy in drug reference.

Multiagent chemotherapy causes drug-induced pancytopenia.

Nursing Diagnosis: Risk for infection related to immunosuppression and reduced food intake.

Planning

Goals (Nursing Outcomes Classification)*

Patient will remain free of infection.

Expected Outcomes

Risk Detection

Patient will remain afebrile.

Patient will develop no signs or symptoms of local infection (e.g., will remain free of cough, cloudy or foul-smelling urine, and purulent drainage from open wound or normal body opening).

Patient will become knowledgeable of infection risks.

Knowledge: Infection Control

Patient will identify routines to follow in the home that reduce the transmission of microorganisms.

Patient will identify signs and symptoms indicating infection to report to her health care provider.

*Outcome classification labels from Moorhead, S., Johnson, M., Maas, M. L. & Swanson, E. (Eds.). (2008). *Nursing outcomes classification (NOC)* (4th ed.). St Louis, MO: Mosby.

► BOX 32-7 NURSING CARE PLAN—cont'd

Interventions (Nursing Intervention Classification)[†]

Prevention and Early Detection

Monitor patient's body temperature routinely, inspect oral cavity for lesions, inspect urethral and vaginal orifices for drainage or discharge, inspect intravenous access site for drainage, and observe patient for evidence of cough.

Rationale

Interventions are designed to prevent and ensure early detection of infection in a patient at risk (Bulechek et al., 2008).

Practise hand hygiene routinely before caring for a patient, between patients, and before any invasive procedures.

Rigorous hand hygiene reduces bacterial counts on the hands (Health Canada, 2007).

Teach patient how to perform hand hygiene correctly.

Patient can easily come in contact with infectious agents that can cause infection.

Consult with dietitian about providing a high-calorie, high-protein, low-bacteria diet. Minimize the intake of salads, undercooked meat, pepper, paprika, and raw fruits and vegetables. Offer small, frequent meals.

Maintaining calorie and protein intake will prevent weight loss. Foods high in bacteria should be avoided because they increase the risk for gastrointestinal infection (Ignatavicius & Workman, 2002).

Infection Control

Instruct patient to report the following to the physician: temperature $>38^{\circ}\text{C}$, persistent cough with or without sputum, pus or foul-smelling drainage from the body site, the presence of an abscess, urine that is cloudy or foul smelling, or burning on urination.

Signs and symptoms are indicative of local or systemic infection.

Teach patient to follow these activities at home:

- Avoid crowds and large gatherings of persons.
- Bathe daily.
- Do not share personal hygiene items with family members (e.g., toothbrush, washcloth, and deodorant stick).
- Take your temperature twice daily.
- Do not drink water that has been standing for >15 minutes.
- Do not reuse cups or glasses without washing.

These measures are designed to prevent infection in patients with impaired immune function (Ignatavicius & Workman, 2002).

[†]Intervention classification labels from Bulechek, G. M., Butcher, H. K., & Dochterman, J. M. (Eds.). (2008). *Nursing interventions classification (NIC)* (5th ed.). St Louis, MO: Mosby.

Evaluation

Nursing Actions

Compare patient's body temperature and other physical findings with baseline data.

Patient Response and Finding

Mrs. Spicer remains afebrile and denies having cough or burning on urination. No signs of drainage or discharge from body site are evident.

Achievement of Outcome

Mrs. Spicer has no active infection at this time.

Ask patient to describe signs and symptoms to report to health care provider.

Mrs. Spicer is able to identify the temperature range to report. She is able to describe cough. She is unable to identify signs of urinary infection or local discharge.

Mrs. Spicer has a partial understanding of signs and symptoms to report. I will require additional instruction and information sheet.

Ask patient to explain the measures to take at home to reduce exposure to infectious agents.

Mrs. Spicer is able to discuss need to avoid sharing personal hygiene articles. She has asked for a list of other precautions and requested that her husband be included in discussion.

Mrs. Spicer has a partial understanding of restrictions. I will obtain printed guidelines and include her husband in discussion this evening.

- Preventing exposure to infectious organisms
- Controlling or reducing the extent of the infection
- Maintaining resistance to infection
- Educating the patient and family about infection control techniques

Setting Priorities

In collaboration with the patient, you establish priorities for the goals of care. For example, for a patient who has an open wound and cancer and cannot tolerate solid foods, the priority of administering therapies that promote wound healing

exceeds the goal of educating the patient to assume self-care therapies at home. When the patient's condition improves, the priorities will change, and patient education will become an essential intervention.

Continuity of Care

The development of a care plan includes infection prevention practices. You may initiate appropriate referrals, such as to a dietitian, infection control professional, or home care nurse, to collaborate in a patient's care. When care is being administered in the home, you should ensure that the environment supports

good infection control practices. For example, if a patient does not have running water, you need to bring a waterless antimicrobial solution during visits to ensure adequate handwashing and hand hygiene. Educating patients and families is also an important aspect of prevention.

❖ Implementation

By recognizing and assessing a patient's risk factors and implementing appropriate measures, you can reduce the risk of infection.

Health Promotion

You may prevent an infection from developing or spreading by minimizing the numbers and kinds of organisms transmitted to potential infection sites. Eliminating reservoirs of infection, controlling portals of exit and entry, and avoiding actions that transmit microorganisms prevent pathogens from finding a new site in which to grow. The proper use of sterile supplies, barrier protection, and proper handwashing and hand hygiene are examples of methods that nurses use to control the spread of microorganisms. A further preventive measure is to strengthen a potential host's defences against infection. Nutritional support, rest, maintenance of physiological protective mechanisms, and receipt of recommended immunizations (Box 32-8) protect a patient from invasion by pathogens.

Being vigilant about infection control helps you to apply good medical–surgical aseptic practices at the right time and in the right clinical situation. When a patient develops an

infection, you need to continue preventive care so that health care personnel and other patients are not exposed to the infection. Isolation precautions may be necessary for patients with communicable diseases; the environment is controlled by barriers against the transmission of infection (see Isolation Guidelines section).

Acute Care Measures

Treatment of an infectious process includes eliminating the infectious organisms and supporting the patient's defences. To identify the causative organism, you may collect specimens of body fluids or drainage from infected body sites for cultures. When the disease process or causative organism has been identified, the physician prescribes the treatment that is most effective for the situation. You properly administer antibiotics and other treatments, watch for adverse reactions, and assess the progress of the infection.

Systemic infections necessitate measures to prevent complications of fever (see Chapter 30). Maintaining the patient's intake of fluids prevents dehydration resulting from diaphoresis. Because of the patient's increased metabolic rate, adequate nutritional intake must be ensured. Rest preserves energy for the healing process.

Localized infections often necessitate measures to remove debris to promote healing. You will need to apply the principles of wound care to remove any infected drainage from the wound site and support the integrity of healing wounds. Special dressings can be applied to facilitate the removal of infectious drainage and promote healing of wound margins. Drainage tubes may be inserted to remove infected drainage from body cavities. You must use medical and surgical aseptic techniques to manage wounds and ensure correct handling of all drainage or body fluids (see Chapter 46).

During the course of infection, you can support the patient's body defence mechanisms. For example, if a patient has infectious diarrhea, you must maintain skin integrity to prevent breakdown and the entrance of microorganisms. Other routine hygiene measures such as bathing and oral care protect the skin and mucous membranes from invasion and overgrowth of microorganisms.

Asepsis

Your efforts to minimize the onset and spread of infection are based on the principles of aseptic technique. **Asepsis** is the absence of pathogenic (disease-producing) microorganisms. *Aseptic technique* refers to practices that keep a patient as free from pathogens as possible. The two types of aseptic technique are medical asepsis and surgical asepsis.

Medical asepsis, or clean technique, includes procedures used to reduce and prevent the spread of microorganisms. Hand hygiene, using clean gloves (i.e., disposable gloves) to prevent direct contact with blood or body fluids, and cleaning the environment routinely are examples of medical asepsis. The principles of medical asepsis are commonly followed in the home, as in washing hands before preparing food.

After an object becomes unsterile or unclean, it is considered *contaminated*. In medical asepsis, an area or object is considered contaminated if it contains or is suspected of containing pathogens. For example, a used bedpan, the floor, and a used dressing are contaminated.

You need to follow certain principles and procedures, including routine practices, to prevent infection and control its spread (see Isolation Guidelines section). During your daily

BOX 32-8

FOCUS ON PRIMARY HEALTH CARE

Immunizations

Immunizations are an essential component of disease prevention. You should encourage proper immunization of infants, children, those at risk, and older adults. In Canada, most provinces provide free-of-charge immunization to infants against measles, mumps, rubella, diphtheria, tetanus, acellular pertussis, and poliomyelitis. Parents may be required to pay to have their infant or child vaccinated against *Haemophilus influenzae* type b (Hib), human papillomavirus (HPV), varicella, and hepatitis B. The HPV vaccine is available in Canada for female patients 9 to 26 years of age. For maximum benefit, it should be given before the patient becomes sexually active.

Older adults and those who have underlying medical conditions are at risk for influenza and pneumonia and are therefore offered influenza vaccines each year and pneumococcal vaccines as per the recommended schedule, which varies according to the recipient's age. You should remind patients of the importance of having a tetanus–diphtheria booster vaccination every 10 years. Health care workers who care for persons at high risk for complications from influenza should be immunized for influenza yearly as well.

In most provinces and territories, public health nurses or community nurses hold free immunization clinics for patients at risk during an outbreak of a potentially deadly infection such as bacterial meningitis.

Source: Health Canada. (2006). *Canadian immunization guide* (7th ed.). Ottawa: Public Health Agency of Canada. Retrieved from http://www.phac-aspc.gc.ca/publicat/cig-gci/pdf/cig-gci-2006_e.pdf.



routine care, use basic medical aseptic techniques to break the infection chain. Because infections are readily transmitted between patients and caregivers, it may become necessary for you to follow isolation precautions as appropriate (see Isolation Guide lines section).

You are responsible for providing the patient with a safe environment. The effectiveness of infection control practices depends on your and your colleagues' conscientiousness and consistency in using effective aseptic technique. It is easy to forget key procedural steps or, in a hurry, to take shortcuts that break aseptic procedures. However, your failure to be meticulous places the patient at risk for an infection that can seriously impair recovery or lead to death.

Control or Elimination of Infectious Agents. Proper cleaning, disinfection, and sterilization of contaminated objects significantly reduce and often eliminate microorganisms. In health care centres, a sterile processing department disinfects and sterilizes reusable supplies. However, you also may be required to perform these functions. Many principles of cleaning and disinfection also apply to the home.

Cleaning. Cleaning is the physical removal of foreign material (e.g., dust, soil, and organic material such as blood, secretions, excretions, and microorganisms) from objects and surfaces (CDC, 2008; Health Canada, 2007). In general, cleaning involves the use of water and mechanical action with detergents or enzymatic products. When an object comes in contact with infectious or potentially infectious material, the object is contaminated. Reusable objects must be cleaned thoroughly before reuse and then either disinfected or sterilized according to the manufacturer's recommendations.

When cleaning equipment that is soiled by organic material such as blood, fecal matter, mucus, or pus, you should take appropriate measures to protect yourself against contamination. These may include wearing a mask and protective eyewear (or a face shield) and waterproof gloves. These barriers provide protection from infectious organisms. A brush and detergent or soap are needed for cleaning.

The following steps ensure that an object is clean:

1. Rinse a contaminated object or article with cold running water to remove organic material. Hot water causes the protein in organic material to coagulate and stick to objects, making removal difficult.
2. After rinsing, wash the object with soap and warm water. Soap or detergent reduces the surface tension of water and emulsifies the dirt or remaining material. Rinse the object thoroughly to remove the emulsified dirt.
3. Use a brush to remove dirt or material in grooves or seams. Friction dislodges the contaminated material for easy removal. Open any hinged items for cleaning.
4. Rinse the object in warm water.
5. Dry the object and prepare it for disinfection or sterilization if indicated by the intended use of the item.
6. The brush, gloves, and sink in which the equipment is cleaned should be considered contaminated and should be cleaned and dried.

Disinfection and Sterilization. Disinfection is the elimination of all pathogens except bacterial spores (CDC, 2008). Disinfectants are used on inanimate objects; antiseptics are used on living tissue. Disinfection usually involves chemicals, heat, or ultraviolet light. An item must be thoroughly cleaned before it is disinfected. Examples of disinfectants are alcohols, chlorines, glutaraldehydes, phenols, and quaternary ammonium compounds. These chemicals can be caustic and

► BOX 32-9

Categories for Sterilization, Disinfection, and Cleaning

Critical Items

Critical items are instruments and devices that enter sterile tissue or the vascular system. They present a high risk of infection if the items are contaminated with microorganisms, including bacterial spores. Critical items must be thoroughly cleaned and sterilized. Examples of these items follow:

- Surgical instruments
- Intravascular catheters
- Urinary catheters
- Needles

Semicritical Items

Semicritical items are devices that come in contact with mucous membranes or nonintact skin but do not penetrate them. These items also present a risk of infection and must be free of all microorganisms (except bacterial spores). Semicritical items must be thoroughly cleaned and disinfected.

The following are examples of these items:

- Electronic thermometers
- Respiratory therapy equipment
- Endotracheal tubes
- Gastrointestinal endoscopes
- Vaginal and nasal specula

Noncritical Items

Noncritical items are items that either touch only intact skin but not mucous membranes or do not directly touch the patient. Noncritical items must be cleaned or cleaned and disinfected. Examples of these items follow:

- Bedpans, urinals, and commodes
- Blood pressure cuffs
- Linens
- Stethoscopes
- Some eating utensils

toxic to tissues. Some disinfectants are indicated for use only on noncritical items; you should read the label and follow the manufacturer's recommendations for use.

Sterilization is the destruction of all microorganisms, including spores. Steam under pressure, ethylene oxide gas, hydrogen peroxide plasma, and chemicals are the most common sterilizing agents. Items must be cleaned thoroughly before they can be sterilized.

Whether an item is to be simply cleaned, or cleaned and disinfected or sterilized, depends on the intended use of the item. Devices are classified in three categories (Box 32-9). You should be familiar with your agency's policy and procedures for cleaning, handling, and delivering care items for eventual disinfection and sterilization. Workers especially trained in disinfection and sterilization should perform most of the procedures. Efficacy of the disinfecting or sterilizing method is influenced by the following factors:

- *Concentration of solution and duration of contact.* A weakened concentration or shortened exposure time may lessen effectiveness.
- *Type and number of pathogens.* Certain organisms are killed more easily than others by disruption. Higher numbers of pathogens on an object necessitate longer disinfecting time.

► TABLE 32-6

Examples of Disinfection and Sterilization Processes**Characteristics****Moist Heat**

Steam is moist heat under pressure. When exposed to high pressure, water vapour can attain a temperature above boiling point to kill pathogens and spores.

Examples of Use

An autoclave is used to sterilize surgical instruments and dressings.

Chemicals

A number of chemical disinfectants are used in health care, including alcohols, chlorines, formaldehyde, glutaraldehydes, hydrogen peroxide, iodophors, phenolics, and quaternary ammonium compounds. Each product performs in a unique manner and is used for a specific purpose.

Chemicals are used for the disinfection of instruments and equipment such as thermometers and endoscopes. Use the appropriate facility-approved disinfectant in a safe manner (e.g., with gloves, proper ventilation) for the approved purpose.

Ethylene Oxide Gas

Ethylene oxide gas destroys spores and microorganisms by altering cells' metabolic processes. Fumes are released within an autoclave-like chamber. This gas is toxic to humans, and aeration time varies with products.

This gas sterilizes some rubber and plastic items.

Boiling Water

Boiling is the least expensive method of sterilization for use in the home. Bacterial spores and some viruses resist boiling. It is not used in hospitals.

The items (e.g., glass baby bottles) should be boiled for at least 15 minutes.

- **Surface areas to treat.** All dirty surfaces and areas must be fully exposed to disinfecting and sterilizing agents.
- **Temperature of the environment.** Disinfectants tend to work best at room temperature.
- **Presence of soap.** Soap may cause certain disinfectants to be ineffective. Thorough rinsing of an object is necessary before disinfecting.
- **Presence of organic materials.** Disinfectants can become inactivated unless blood, saliva, pus, or body excretions are already washed off.

Table 32-6 lists processes for disinfection and sterilization and their characteristics. Selection of the method for disinfecting or sterilizing an item depends on the intended use and nature of the item (e.g., some delicate instruments cannot tolerate steam and must be sterilized with gas or plasma).

Control or Elimination of Reservoirs. To control or eliminate reservoir sites for infection, you need to eliminate or control sources of body fluids, drainage, or solutions that

► BOX 32-10

Infection Control to Reduce Reservoir Sites**Bathing**

Use soap and water to remove drainage, dried secretions, or excess perspiration.

Dressing Changes

Change dressings that become wet or soiled (see Chapter 46).

Contaminated Articles

Place tissues, soiled dressings, and soiled linen in moisture-resistant bags for proper disposal.

Contaminated Needles

Engage the safety features of all sharp devices and dispose of them in a puncture-proof container. Place syringes, uncapped hypodermic needles, and intravenous needles in puncture-proof containers, which should be located in patient rooms or treatment areas so that exposed, contaminated equipment need not be carried a distance (see Chapter 33). *Do not recap needles or attempt to break them.*

Bedside Unit

Keep table surfaces clean and dry.

Bottled Solutions

Do not leave bottled solutions open for prolonged periods. Keep solutions tightly capped. Date bottles when opened and discard according to your facility's policy.

Surgical Wounds

Keep drainage tubes and collection bags patent to prevent the accumulation of serous fluid under the skin surface.

Drainage Bottles and Bags

Empty and dispose of drainage suction bottles according to your health agency's policy. Empty all drainage systems on each shift unless otherwise ordered by a physician. Never raise a drainage system (e.g., urinary drainage bag) above the level of the site being drained unless the drainage system is clamped off.

might harbour microorganisms. You must also carefully discard articles that become contaminated with infectious material (Box 32-10). All health care institutions must have guidelines for the disposal of infectious waste according to provincial or territorial laws.

Control of Portals of Exit. You will need to follow several measures to minimize or prevent infectious organisms from exiting the body. To control organisms exiting via the respiratory tract, you should wear a mask as needed, avoid talking directly into patients' faces, and never talk, sneeze, or cough directly over surgical wounds or sterile dressing fields. You should cover your mouth or nose when sneezing or coughing. You are also responsible for teaching patients to protect others when they sneeze or cough and for providing patients with disposable wipes or tissues to control the spread of microorganisms.

If you have an upper respiratory tract infection, you should consider not working; you may be required to remain at home. If you continue to work with patients, you should wear a mask when working closely with a patient and pay special attention to hand hygiene. You should not be caring for patients who are highly susceptible to infection (e.g., an immunosuppressed patient or a neonate).

Another way of controlling the exit of microorganisms is through the careful handling of blood, body fluids, secretions, or excretions (e.g., urine, feces, vomitus, and exudate). Contaminated fluids can easily splash while being discarded or cleaned up. You should always wear disposable gloves when handling blood, body fluids, secretions, or excretions. Masks, gowns, and protective eyewear should be worn if splashing or contact with any fluids is possible. You should appropriately dispose of disposable soiled items in impervious plastic bags. Laboratory specimens from all patients are handled as if they were infectious.

Control of Transmission. Effective control of infection requires you to remain aware of the modes of transmission and ways to control them. In the hospital, home, or long-term care facility, a patient should have a personal set of care items. The sharing of bedpans, urinals, bath basins, and eating utensils can easily lead to transmission of infection. Thermometers, even when individually used, warrant special care. Because the patient's own mucus can become a source of microorganism growth, the electronic thermometer is used with a disposable sheath over the probe; the sheath is discarded after each use. Single-use chemical strip thermometers present less risk of infection than do other thermometers. Use of electronic thermometers for rectal temperatures has been associated with nosocomial diarrhea (Jernigan et al., 1998). The organism *C. difficile* is able to survive on inanimate surfaces such as a thermometer probe for weeks to months. In institutions where nosocomial diarrhea occurs, electronic thermometers are not recommended for rectal temperatures.

To prevent transmission of microorganisms through indirect contact, soiled items and equipment must not touch your clothing. A common error is to carry dirty linen in the arms against the uniform. Fluid-resistant linen bags should be used, or soiled linen should be carried with hands held out from the body. Laundry hampers should be replaced before they are overflowing.

Handwashing/Hand Hygiene. Hand hygiene is the most important and most basic technique in preventing the transmission of infections. Hand hygiene includes using an instant alcohol hand antiseptic before and after providing patient care, handwashing with soap and water when hands are visibly soiled, and performing a surgical scrub when necessary. The components of good **handwashing** include using an adequate amount of soap, rubbing the hands together to lather the soap and create friction, and rinsing under a stream of water (Health Canada, 2007). The purpose is to remove soil and transient organisms from the hands and to reduce total microbial counts over time.

Contaminated hands are a prime cause of cross-infection. For example, imagine you are caring for a patient who has excessive pulmonary secretions, and you assist the patient in expectorating mucus and disposing of the tissues in a bedside container. The patient's roommate asks you to open containers of food on the meal tray. You then leave the patient's room to pour a dose of medication that is to be taken in five minutes. If you fail to perform hand hygiene before opening the containers of food or pouring the medication, organisms from the first patient's mucus can easily be transmitted to the roommate's food and to the medication container. Decreased nosocomial infection rates have been reported with improved handwashing and hand hygiene compliance (WHO, 2005).

The decision regarding when and what type of hand hygiene should occur depends on the following: the intensity

of contact with patients or contaminated objects, the degree or amount of contamination that could occur with that contact, the susceptibility of the patient or the health care worker to infection, and the procedure or activity to be performed (Boyce & Pittet, 2002, pp. 4–8). For example, after prolonged and direct contact with a patient's wound drainage, you must perform thorough hand hygiene.

Washing times of at least 15 seconds are needed to remove most transient microorganisms from the skin (CDC, 2007). If the hands are visibly soiled, more time may be needed. Routine handwashing may be performed with plain soap. Plain soap with water can physically remove a certain level of microbes, but antiseptic agents are necessary to kill or inhibit microorganisms and reduce the level still further (CDC, 2007). Skill 32-1 lists the steps for hand hygiene.

The use of alcohol-based waterless antiseptics is recommended by the CDC (2007) to improve hand hygiene practices, protect health care workers' hands, and reduce the transmission of pathogens to patients and personnel in health care settings. Alcohols have excellent germicidal activity and are more effective than either plain soap or antimicrobial soap and water. Emollients are added to alcohol-based antiseptics to prevent drying of the skin. Researchers have found that these antiseptics may be more effective than water because they are used quickly and are available at the bedside (Girou et al., 2002; Parienti et al., 2002).

The CDC (2007) recommended that hands be washed with plain soap or with antimicrobial soap and water when hands are visibly soiled. If your hands are not visibly soiled, use an alcohol-based waterless antiseptic agent for routine decontamination of hands in all other clinical situations:

- Before direct contact with each patient (e.g., taking a pulse or blood pressure, lifting a patient)
- After direct contact with each patient
- Before donning sterile gloves
- After removing gloves (i.e., after removing sterile gloves or clean, nonsterile gloves)
- After contact with body fluids or excretions, mucous membranes, nonintact skin, or wound dressings, as long as hands are not visibly soiled (if visibly soiled, wash with soap and water)
- When moving from a contaminated body site to a clean body site during patient care
- After contact with inanimate objects (including medical equipment) in the immediate vicinity of the patient

Alternatively, if antiseptic agents are not available, you may wash hands in all clinical situations (CDC, 2007). Also, health care workers are advised to wash their hands with soap and water if patient exposure to *C. difficile* is suspected or proven. The physical action of washing and rinsing hands under such circumstances is recommended because antiseptic agents have poor activity against spores (Louie & Meddings, 2004).

You need to instruct patients and visitors about the proper technique and times for hand hygiene. Ensure that patients and visitors understand the importance of cleaning under their nails and that artificial nails should not be worn because they harbour increased numbers of pathogens (Box 32-11). Teaching handwashing and hand hygiene is particularly important if health care is to continue at home. Patients should wash their hands before eating or handling food; after handling contaminated equipment, linen, or organic material; and after elimination. Visitors are encouraged to wash their hands before eating or handling food, after coming in contact with infected patients,

► SKILL 32-1 Handwashing/Hand Hygiene



Delegation Considerations

- Monitor an unregulated care provider (UCP) to ensure that he or she is using the proper method of hand hygiene.
- Instruct the UCP to report any skin irritation from soaps or antimicrobials.

Procedure

STEPS

1. Inspect surface of hands for breaks or cuts in skin or cuticles. Report and cover lesions before providing patient care.
2. Inspect hands for visible soiling.
3. Inspect nails for length and presence of artificial acrylics or chipped nail polish.
4. Assess patient's risk for, or extent of, infection (e.g., WBC count, extent of open wounds, known medical diagnosis).
5. Push wristwatch and long uniform sleeves above wrists. Avoid wearing rings. If worn, remove for the duration of the procedure.
6. If hands are visibly dirty or contaminated with protein-containing material, use water and plain soap or antimicrobial soap for handwashing:
 - A. Stand in front of sink, keeping hands and uniform away from sink surface. (If hands touch sink during handwashing, repeat procedure.)
 - B. Turn on water. Turn faucet on or push knee pedals laterally or press pedals with foot to regulate flow and temperature (see Step 6B illustration).



Step 6B Turn on water.

- C. Avoid splashing water against uniform.
- D. Regulate flow of water so that temperature is warm.
- E. Wet hands and wrists thoroughly under running water. Keep hands and forearms lower than elbows during washing.
- F. Apply a small amount of soap, lathering thoroughly (see Step 6F illustration). Soap granules and leaflet preparations may be used.

Equipment

- Easy-to-reach sink with warm running water
- Antimicrobial or regular soap
- Alcohol-based waterless antiseptic
- Paper towels or air dryer
- Clean orangewood stick (optional)

RATIONALE

- Open cuts or wounds can harbour high concentrations of microorganisms. Agency policy may prevent you from caring for high-risk patients. If dermatitis occurs, additional interventions may be needed.
- Lengthier handwashing is needed if soiling is heavy.
- Nails should be short and filed because most microbes on hands come from beneath the fingernails. Nails should be free of artificial applications and chipped or old nail polish (CDC, 2006). (See Box 32-11.)
- Use of alcohol-based waterless antiseptic is encouraged if you will be working with patients who are immunosuppressed (WHO, 2005).
- Provide complete access to fingers, hands, and wrists. Wearing of rings increases number of microorganisms on hands (CDC, 2006).
- Inside of sink is a contaminated area. Reaching over the sink increases the risk of touching the edge, which is contaminated.

- Microorganisms travel and grow in moisture.
- Warm water removes less of the protective oils than does hot water.
- Hands are the most contaminated parts to be washed. Water flows from least to most contaminated area, rinsing microorganisms into the sink.
- Antimicrobial soaps used exclusively can be drying to hands and can cause skin irritations. The decision of whether to use an antimicrobial soap or alcohol-based hand antiseptic should depend on the procedure to be performed and the patient's immune status.

► SKILL 32-1 Handwashing/Hand Hygiene—cont'd



- G. Wash hands using plenty of lather and friction for at least 10 to 15 seconds. Interlace fingers and rub palms and back of hands with circular motion at least five times each. Keep fingertips down to facilitate removal of microorganisms. Rub knuckles of one hand into the palm of the other; repeat with other hand (see Step 6G illustration).



Step 6F Lather hands thoroughly.

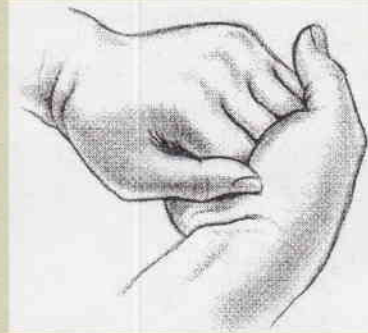
- H. Rub thumb on one hand with the palm of the other hand; repeat with other hand (see Step 6H illustration).
I. Work the fingertips on one hand into the palm of the other. Massage soap into nail spaces; repeat with other hand (see Step 6I illustration).



Step 6H Rub the thumb into the palm of the other hand. **Source:** Redrawn from World Health Organization. (2005). World Alliance for Patient Safety, *WHO Guidelines on hand hygiene in health care. Advanced draft: A summary. Clean hands are safer hands* (Handwashing technique with soap and water, p. 19, Step 6). Retrieved from http://www.who.int/patientsafety/events/05/HH_en.pdf.

- J. Areas under fingernails are often soiled. Clean them with orangewood stick or fingernails of other hand and additional soap.

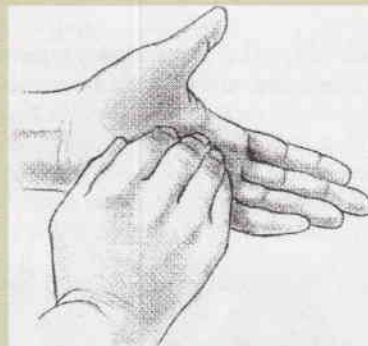
- Soap cleanses by emulsifying fat and oil and lowering the surface tension of water. Friction and rubbing mechanically loosen and remove dirt and transient bacteria. Interlacing fingers and thumbs and rubbing knuckles ensure that all surfaces are cleansed.



Step 6G Rub the knuckles of one hand into the palm of the other.

Source: Redrawn from World Health Organization. (2005). World Alliance for Patient Safety, *WHO Guidelines on hand hygiene in health care. Advanced draft: A summary. Clean hands are safer hands* (Handwashing technique with soap and water, p. 19, Step 5). Retrieved from http://www.who.int/patientsafety/events/05/HH_en.pdf.

- Thumbs are frequently missed areas.
- Fingertips are frequently missed areas.



Step 6I Work the fingertips into the palm of the other hand.

Source: Redrawn from World Health Organization. (2005). World Alliance for Patient Safety, *WHO Guidelines on hand hygiene in health care. Advanced draft: A summary. Clean hands are safer hands* (Handwashing technique with soap and water, p. 19, Step 7). Retrieved from http://www.who.int/patientsafety/events/05/HH_en.pdf.

- Areas under nails can be highly contaminated, which increases the risk of infection.

Critical Decision Point: Do not tear or cut skin under or around nail.

Continued

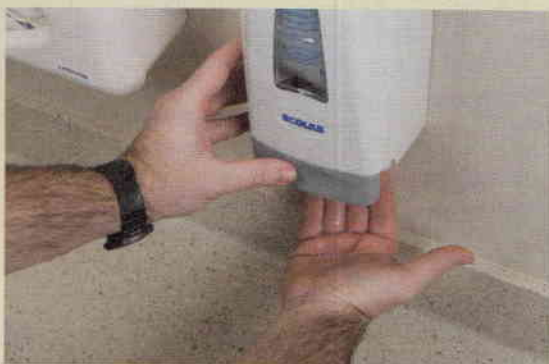
► SKILL 32-1 Handwashing/Hand Hygiene—cont'd

video

- K. Rinse hands and wrists thoroughly, keeping hands down and elbows up (see Step 6K illustration).
- L. Optional: Repeat steps A through J and extend period of washing if hands are heavily soiled.
- M. Dry hands thoroughly from fingers to wrists and forearms with paper towel, single-use cloth, or warm-air dryer.
- N. If paper towel is used, discard it in proper receptacle.
- O. Turn off water with foot or knee pedals. To turn off hand faucet, use clean, dry paper towel; avoid touching handles with hands (see Step 6O illustration).

**Step 6K** Rinse hands.

- P. If hands are dry or chapped, a small amount of lotion or barrier cream can be applied.
 - Q. Inspect surfaces of hands for obvious signs of soil or other contaminants.
 - R. Inspect hands for dermatitis or cracked skin.
7. If hands are not visibly soiled, use an alcohol-based waterless antiseptic for routine decontamination of hands in all clinical situations.
- A. Apply an ample amount of product to palm of one hand (see Step 7A illustration).
 - B. Rub hands together, covering all surfaces of hands and fingers with antiseptic (see Step 7B illustration).

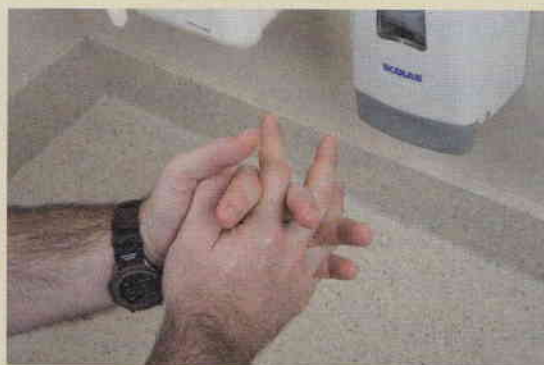
**Step 7A** Apply enough waterless antiseptic to palm of one hand to cover all hand surfaces—usually two to three pumps.

- C. Rub hands together for several seconds until alcohol is dry. Allow hands to dry before applying gloves.
- D. If hands are dry or chapped, a small amount of lotion or barrier cream can be applied.

- Rinsing mechanically washes away dirt and microorganisms.
- Drying from cleanest (fingertips) to least clean (forearms) area avoids contamination. Drying hands prevents chapping and roughened skin.
- Prevents transfer of microorganisms.
- Faucets are contaminated. Using paper towels to touch faucet prevents contamination of hands.

**Step 6O** Turn off faucet.

- Use agency-provided container of lotion because many lotions may interfere with antimicrobial action or disintegrate gloves.
- Determine whether handwashing is adequate.
- The presence of these conditions indicates complications from excessive handwashing.
- Enough product is needed to thoroughly cover the hands.
- Complete coverage of the hands and fingers by using friction ensures antimicrobial effect.

**Step 7B** Rub hands thoroughly.

- Drying ensures full antiseptic effect (Health Canada, 2007).
- Use the agency-provided container of lotion because many lotions may interfere with antimicrobial action or disintegrate gloves.

► SKILL 32-1 Handwashing/Hand Hygiene—cont'd



Recording and Reporting

- It is not necessary to record or report this procedure.
- Report any dermatitis to employee health or infection control per agency policy.

Home Care Considerations

- Evaluate the handwashing facilities in the home to determine the possibility of contamination, the proximity of the facilities to the patient, and available supplies in the area.
- Evaluate the availability of warm running water and soap when conducting home visits, and anticipate the need for alternative handwashing products such as alcohol-based hand rubs and detergent-containing towels.
- Instruct the patient and primary caregiver in the proper techniques and situations for handwashing.

* BOX 32-11 RESEARCH HIGHLIGHT

Reducing Surgical Site Infections

Research Focus

As the patient's skin is a major source of pathogenic organisms that cause surgical site infections, perhaps one solution used for surgical site preparation is more optimal in reducing postoperative infections. Researchers hypothesized that preoperative skin preparation with chlorhexidine-alcohol is more effective in preventing infection than povidone-iodine.



Research Abstract

Darouiche et al. (2010) randomly assigned adults undergoing clean-contaminated surgery at six hospitals to receive preoperative skin preparation with either 2% chlorhexidine gluconate and 70% alcohol scrub or an aqueous solution of 10% povidone-iodine scrub and then povidone-iodine paint. The patients who were eligible to be in the study were 18 years and older and were going to have clean-contaminated surgery (i.e., colorectal, small intestine, gastroesophageal, biliary, thoracic, gynecological, or urological operations). Patients were excluded if they had an allergy to chlorhexidine, alcohol, or iodophors; if there was evidence of an infection at or adjacent to the operative site; or if there was a perceived inability to follow the patient for 30 days after surgery. The patients were assessed for infection at least daily while they were in the hospital. After discharge, the patients were called once a week. If an infection was suspected, a prompt clinical assessment was done. Investigators doing the follow-up were unaware of which skin preparation product group the patients were randomized to. A total of 849 patients were randomized, 409 in the chlorhexidine-alcohol group and 440 in the povidone-iodine group. The overall surgical site infection rate was significantly lower in the chlorhexidine-alcohol group than the povidone-iodine group (9.5% versus 16.1%; $P = 0.004$; relative risk, 0.59; 95% confidence interval, 0.41 to 0.85).

Evidence-Informed Practice

- Using chlorhexidine-alcohol for preoperative preparation of the patient's skin is more effective than povidone-iodine in reducing surgical site infection after clean-contaminated surgery.

Reference: Darouiche, R. O., Wall, M. J., Itani, K. M. F., Otterson, M. F., Webb, A. L., Carrick, M. D., Miller, H. J., Awad, S. S., Crosby, C. T., Mosier, M. C., AlSharif, A., and Berger, D. H. (2010). Chlorhexidine-alcohol versus povidone-iodine for surgical site antisepsis. *New England Journal of Medicine*, 362(1), 18–26.

and after handling contaminated equipment or organic material.

Control of Portals of Entry. Many measures that control the exit of microorganisms likewise control their entrance. Maintaining the integrity of skin and mucous membranes reduces the chances of microorganisms reaching a host. The patient's skin should be kept well lubricated by using lotion as appropriate. Immobilized and debilitated patients are particularly susceptible to skin breakdown. Patients should not be positioned on tubes or objects that might cause breaks in the skin. Dry, wrinkle-free linen also reduces the chances of skin breakdown. Frequent turning and positioning are needed before a patient's skin becomes reddened. Frequent oral hygiene prevents the drying of mucous membranes. A water-soluble ointment keeps the patient's lips well lubricated.

After elimination, a woman should clean the rectum and perineum by wiping from the urinary meatus toward the rectum. Cleansing in a direction from the least to the most contaminated area helps reduce genitourinary infections. Meticulous and frequent perineal care is especially important in women who wear incontinence pads.

Patients, health care workers, and even housekeepers are at risk for acquiring infections from accidental needle sticks. After administering an injection or inserting an intravenous catheter, you should engage any safety device and carefully dispose of needles in a puncture-resistant box (see Chapter 33). A stray needle lying in the bed linen or carelessly thrown into a wastebasket is a prime source of exposure to bloodborne pathogens. Hepatitis B and C are the infections most commonly transmitted by contaminated needles. A needle stick should be reported immediately. Health care agencies require the victim of a needle stick to complete an injury report and seek appropriate treatment. The Canadian Needle Stick Surveillance Network (2003) has the mandate to monitor health care workers exposed to needle sticks and the subsequent outcomes of these exposures.

Another cause of microorganism entrance into a host is improper handling and management of urinary catheters and drainage sets (see Chapter 43). The point of connection between a catheter and drainage tube should remain closed and intact. As long as such systems are closed, their contents are considered sterile. Outflow spigots on drainage bags should also remain closed to prevent the entrance of bacteria. Movement of the catheter at the urethra should be minimized by stabilizing the catheter with tape to reduce chances of microorganisms

ascending the urethra into the bladder. Urine-measuring containers should not be shared between patients.

You may care for patients with closed drainage systems that collect wound drainage, bile, or other body fluids. In each example, the site from which a drainage tube exits should remain clear of excess moisture and accumulated drainage. All tubing should remain connected throughout use. Drainage receptacles should be opened only when it is necessary to discard or measure the volume of drainage.

At times, you will obtain specimens from drainage tubes or intravenous tubing ports. First, you must perform hand hygiene; then disinfect tubes and ports by wiping the surface outward with alcohol, iodine, or a chlorhexidine alcohol solution before entering the system. Temporarily placing squares of sterile gauze around the ends of an open drainage tube, such as a urinary catheter, adds further protection against bacteria. However, keeping drainage tubes closed and secure is the best practice.

A final method for reducing the entrance of microorganisms is the technique for cleansing wounds (see Chapter 46). A surgical wound is considered to be sterile. To prevent the entrance of microorganisms into the wound, you should clean outward from a wound site. When applying an antiseptic or cleaning with soap and water, wipe around the wound edge first and then clean outward away from the wound. Clean gauze should be used for each revolution around the wound's circumference.

Protection of the Susceptible Host. Patients' resistance to infection improves as you protect their normal body defences against infection. You can intervene to maintain the body's normal reparative processes (Box 32-12). You must also protect yourself and others by following your agency's isolation guidelines.

Isolation Guidelines. The risk of transmitting a health care-associated infection or infectious disease among patients

is high. When a patient has a suspected or known infection, health care workers are alerted and follow infection control practices. However, sometimes health care workers are not aware that patients have infections. The majority of organisms causing nosocomial infections are found in the colonized body substances of patients regardless of whether a culture has confirmed infection and a diagnosis has been made (CDC, 2007). Body substances such as feces, saliva, mucus, and wound drainage always contain potentially infectious organisms.

The CDC issued isolation guidelines in 1996 that contain a two-tiered approach (Garner, 1996). These guidelines were updated and expanded on in 2007 and have been adopted by most health care agencies. Some health care agencies have adopted Health Canada's isolation guidelines (1999), which contain a similar two-tiered approach. The Health Canada guidelines were written to accommodate acute, long-term, home, and ambulatory care settings, whereas the CDC guidelines were written specifically for acute care settings. Nevertheless, the CDC guidelines and Health Canada's guidelines are essentially interchangeable.

The first tier of the isolation guidelines contains practices designed to care for all patients in any setting, regardless of their diagnosis or presumed infectiousness (Table 32-7). In Health Canada's guidelines, it is called *routine practices*. **Routine practices** apply when a health care worker is or potentially may be exposed to (1) blood; (2) all body fluids, secretions, and excretions except sweat; (3) nonintact skin; or (4) mucous membranes. Routine practices include the appropriate use of gowns, gloves, masks, eyewear, and other protective devices or clothing. Barrier protection is indicated for use with all patients because every patient has the potential to transmit infection via blood and body fluids and the risk for infection transmission can be unknown. Routine practices also include rules on appropriate handwashing, cleaning of equipment, and disposal of contaminated linen and sharps.

The second tier of the isolation guidelines is additional precautions. These precautions are designed to contain pathogens in one area, usually the patient's room; therefore, they are often called **isolation precautions**. Only patients infected or colonized with certain highly transmissible or epidemiologically significant pathogens are placed under isolation precautions. These precautions are followed in addition to routine practices. Isolation precautions are categorized in three ways: airborne, droplet, and contact precautions (see Table 32-7). The precautions used depend on how the pathogen is spread. For example, a patient diagnosed with (or suspected of having) active tuberculosis would require the use of airborne precautions, using a special mask and ventilated room, in conjunction with routine practices.

Regardless of the category of isolation precaution (Box 32-13), you must observe the following basic principles:

- Observe thorough hand hygiene before entering and leaving the room of a patient in isolation.
- Dispose of contaminated supplies and equipment in a manner that prevents the spread of microorganisms to other persons as indicated by the mode of transmission of the organism.
- Apply knowledge of a disease process and the mode of infection transmission when using protective barriers.
- Ensure that all persons who might be exposed during transport of a patient outside the isolation room are protected.

Psychological Implications of Isolation Precautions. A patient required to be in isolation in a private room may

► BOX 32-12

Infection Control: Protecting the Susceptible Host

Protecting Normal Defence Mechanisms

Regular bathing removes transient microorganisms from the skin's surface. Lubrication helps keep the skin hydrated and intact. Regular oral hygiene removes proteins in the saliva that attract microorganisms. Flossing removes tartar and plaque that can cause infection.

Maintenance of adequate fluid intake promotes normal urine formation and a resultant outflow of urine to flush the bladder and urethral lining of microorganisms.

For physically dependent or immobilized patients, you should encourage routine coughing and deep breathing to keep patients' lower airways clear of mucus.

You should encourage proper immunization of children and adult patients (see Box 32-8).

Maintaining Healing Processes

Promote the intake of adequate fluids and a well-balanced diet containing essential proteins, vitamins, carbohydrates, and fats.

You should also use measures to increase the patient's appetite.

Promote a patient's comfort and sleep so that energy stores are replenished daily.

You can assist a patient in learning techniques to reduce stress.

► **TABLE 32-7** Health Canada Routine Practices and Additional Precautions

Routine Practices

Routine practices and precautions are for the care of all patients; they incorporate previous precautions against bloodborne pathogens (Universal Precautions) and Body Substance Isolation.

Hand hygiene must be performed before and after direct patient contact; before and after contact with the patient's environment, after contact with blood, body fluids, secretions, and excretions and after contact with equipment or articles contaminated by them; before gloves are put on and immediately after gloves are removed. (Refer to your agency's policy for use of alcohol-based waterless antiseptics.)

Gloves are worn when touching blood, body fluids, secretions, excretions, nonintact skin, mucous membranes, or contaminated items. Gloves should be removed and hand hygiene performed between care of patients. Gloves should also be changed and hand hygiene performed between procedures on the same patient and after contact with material that may be highly contaminated.

Masks, eye protection, or face shields are worn if patient care activities or procedures may generate splashes or sprays of blood or body fluid. Gowns should be used to protect uncovered skin and prevent soiling of clothing during procedures and patient care activities likely to generate a splash or spray of blood or body fluid.

Reusable patient care equipment is properly cleaned and reprocessed before use in the care of another patient. Single-use items are discarded. All soiled linen from health care facilities should be handled the same way for all patients. If the bag soaks through, an additional bag should be used.

Used sharp instruments and needles are discarded in a puncture-resistant container, which is located in the area where the item is used.

Generally, a single room is unnecessary for routine patient care. Patients who visibly soil the environment or for whom appropriate hygiene cannot be maintained should be placed in a single room with dedicated toileting facilities.

ADDITIONAL (ISOLATION) PRECAUTIONS (TIER TWO)

Category	Description and Disease	Barrier Protection
Airborne precautions	For known or suspected infections caused by microbes transmitted by airborne droplets; examples: measles, chicken pox (varicella), disseminated zoster, tuberculosis	Private room (room door kept closed), negative-pressure airflow of at least six exchanges per hour, respiratory protection device (e.g., N95 respirator) must be worn when the patient has tuberculosis or when the patient has varicella, disseminated zoster, or measles and the worker is not immune
Droplet precautions	For known or suspected infections caused by microbes transmitted by droplets produced by coughing, sneezing, or talking; examples: diphtheria (pharyngeal), rubella, influenza, pertussis, mumps, meningococcal pneumonia, or sepsis	Private room or cohort patients (room door closed unless bed is more than 2 m from the door), mask is worn when within 2 m of the patient
Contact precautions	For known or suspected infections caused by direct or indirect contact; examples: colonization or infection with multidrug-resistant organisms; <i>C. difficile</i> ; major wound infections; gastrointestinal, respiratory, or skin infections	Private room or cohort patients (door can be open); gloves and gown upon entry into isolation room; limiting patient movement outside of isolation room to necessary medical treatments or procedures; cleaning and disinfecting or discarding items before removal from isolation room

Adapted from Health Canada. (2007). Infection prevention and control best practices for long term care, home and community care including health care offices and ambulatory clinics. Retrieved from <http://www.phac-aspc.gc.ca/amr-ram/ipcbp-pepci/infection-eng.php>.

► BOX 32-13 Procedural Guideline

Caring for a Patient on Isolation Precautions

Delegation Considerations:

Care of a patient in isolation can be delegated to an unregulated care provider (UCP) when necessary procedures are within the UCP's competence.

Equipment:

- Barrier protection determined by type of isolation
- Supplies necessary for procedures performed in room

Procedure:

1. Assess isolation indications (e.g., current laboratory test results or the patient's history of exposure).

2. Review agency policies and precautions necessary for the specific isolation category, and consider care measures to be performed while in the patient's room.
3. Review nurses' notes or confer with colleagues regarding the patient's emotional state and adjustment to isolation.
4. Perform handwashing and hand hygiene and prepare all equipment to be taken into the patient's room.
5. Prepare for entrance into isolation room:
 - A. Perform handwashing and hand hygiene.
 - B. Apply gown (when needed), making sure it covers you from neck to knees. Pull sleeves down to wrist. Tie securely at neck and waist (see Step 5B illustration).

Continued

► BOX 32-13 Procedural Guideline—cont'd



Step 5B Tie gown at waist.

- C. Apply either surgical mask or respirator around mouth and nose when needed. (Type will depend on type of isolation and facility policy.)
- D. Apply eyewear or goggles snugly and adjust to fit around face and eyes (when needed).
- E. Apply disposable nonsterile gloves for isolation. (Note: Unpowdered, latex-free gloves should be worn if the patient or the health care worker has a latex allergy.) If gloves are worn with a gown, bring the glove cuffs over edge of the gown sleeves.
- 6. Enter the patient's room. Arrange supplies and equipment. (If equipment will be removed from room for reuse, place it on a clean paper towel.)
- 7. Explain purpose of isolation and necessary precautions to the patient and family. Offer an opportunity to ask questions. Assess for evidence of emotional problems that may be caused by being in isolation.
- 8. Assess vital signs:
 - A. If patient is infected or colonized with a resistant organism (e.g., vancomycin-resistant enterococci [VRE] or methicillin-resistant *Staphylococcus aureus* [MRSA]), the equipment remains in room. Proceed to assess vital signs. Avoid contact of stethoscope or blood pressure cuff with infectious material.
 - B. If stethoscope is to be reused, the entire stethoscope must be thoroughly cleaned after leaving the room. You may use a few alcohol swabs to clean and disinfect the stethoscope. (Ideally, equipment is dedicated for the use of the patient with an antibiotic-resistant organism and remains in the room.) Clean diaphragm or bell with alcohol. Set aside on clean surface.
 - C. Individual or disposable thermometers should be used.
- 9. Administer medications:
 - A. Give oral medication in wrapper or cup.
 - B. Dispose of wrapper or cup in plastic-lined receptacle.
 - C. Administer injection.
 - D. Discard syringe and uncapped needle or sheathed needle into special container.
 - E. If gloves are not worn and hands contact contaminated article or body fluids, wash hands immediately.

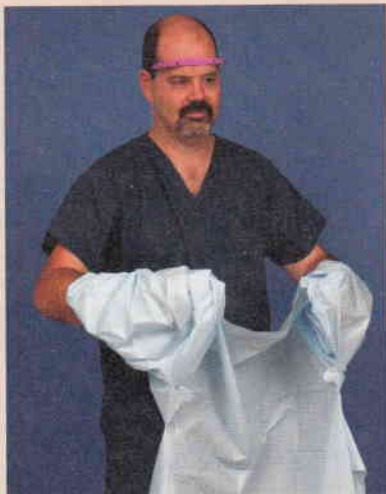
- 10. Administer hygiene measures, encouraging the patient to discuss questions or concerns about isolation. Informal teaching can be used at this time:
 - A. Prevent the gown from becoming wet.
 - B. Remove linen from the bed; avoid contact with the gown. Place linen in an impervious bag.
 - C. Change gloves and wash your hands if they become excessively soiled and further care is necessary.
- 11. Collect specimens:
 - A. Place specimen containers on a clean paper towel in the patient's bathroom.
 - B. Follow procedure for collecting specimen of body fluids.
 - C. Transfer specimen to the container without soiling the outside of the container. Place the container in a plastic bag, and place a label on the outside of the bag or as per agency policy.



Step 12B Tie linen securely.

- 12. Dispose of linen and garbage bags as they become full:
 - A. Use sturdy, moisture-resistant single bags to contain soiled articles.
 - B. Tie bags securely at the top in a knot (see Step 12B illustration).
- 13. Resupply room as needed.
- 14. When leaving isolation room, remove personal protective equipment, except for N95 respirator, inside doorway or in anteroom. Remove N95 respirator after leaving the patient's room and closing the door.
 - A. Remove gloves. Remove one glove by grasping the cuff and pulling the glove inside out over the hand. Discard the glove. With the ungloved hand, tuck a finger inside the cuff of the remaining glove and pull it off, inside out.
 - B. Perform handwashing and hand hygiene.
 - C. Untie waist and neck strings of the gown. Allow the gown to fall from your shoulders. Remove hands from sleeves without touching the outside of the gown (see Step 14C illustration). Hold the gown inside at shoulder seams and fold inside out; discard in laundry bag.

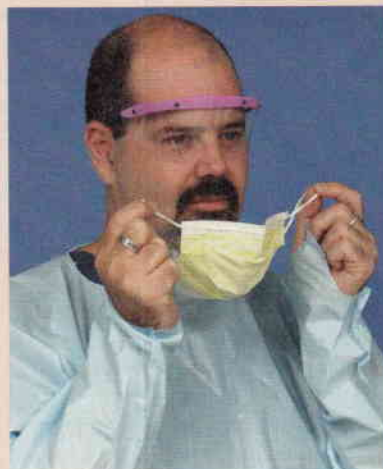
► BOX 32-13 Procedural Guideline—cont'd



Step 14C Remove hands from sleeves without touching outside of the gown.

D. Perform hand hygiene.

E. Untie first bottom mask string and then top strings; pull the mask away from your face, and drop the mask into a waste receptacle (see Step 14E illustration). (Do not touch outer surface of mask.)



Step 14E Remove mask away from face.

F. Remove eyewear or goggles.

G. Perform handwashing and hand hygiene.

H. Explain to the patient when you plan to return to the room. Ask whether the patient requires any personal-care items, books, or magazines.

I. Leave the room and close the door, if necessary. (Door should be closed if airborne precautions are being used.)

J. All contaminated supplies and equipment should be disposed of in a manner that prevents the spread of microorganisms to other individuals (see your agency's policy).

* BOX 32-14 RESEARCH HIGHLIGHT

Adverse Effects of Isolation

Research Focus

Stelfox et al. (2003) studied whether patients who are isolated in single rooms experience adverse effects as a result of the isolation.

Research Abstract

A Canadian and an American hospital were included in a study to examine the likelihood of adverse events. Patients who were cared for in isolation because they were infected with MRSA were compared with those who were not isolated. The research found that (1) isolated patients were more likely to complain about care than were nonisolated patients (8% versus 1%); (2) vital signs were not recorded on charts as ordered as often for isolated patients as for nonisolated patients (51%

versus 31%); (3) nurses were less likely to record nursing notes for isolated patients (14% versus 10%); and (4) patients in isolation were eight times more likely to experience falls, pressure ulcers, and fluid or electrolyte disorders.



Evidence-Informed Practice

- You must be extra vigilant to ensure the standard of care is similar for all patients, including those on isolation precautions.
- You should ensure that both physical and psychological factors are addressed when planning and carrying out care for isolated patients.
- You must ensure that you record observations and complete nursing notes for all patients, including those in isolation.

Reference: Stelfox, H. T., Bates, D. W., & Redelmeir, D. A. (2003). Safety of patients isolated for infection control. *Journal of the American Medical Association*, 290, 1899–1905.

become lonely because normal social relationships are disrupted. This situation can be psychologically harmful, especially for children (Box 32-14).

Patients' body image may be altered as a result of the infectious process. Patients may feel unclean, rejected, lonely, or guilty. Infection prevention and control practices further intensify these feelings of difference or undesirability. Isolation in a private room limits sensory contact. Unless you act to minimize feelings of psychological and physical isolation, your patients' emotional state can interfere with their recovery.

Before isolation measures are instituted, a patient and family must understand the nature of the disease or condition, purposes of isolation, and steps for carrying out specific precautions. If they are able to participate in maintaining infection prevention, the chances of reducing the spread of infection are increased. The patient and family should be taught to perform hand hygiene and use barrier protection if appropriate. Each procedure should be demonstrated, and the patient and family should be given an opportunity to practise it. It is also important to explain how infectious organisms can be transmitted so

that the patient understands the difference between contaminated and clean objects.

You should take measures to improve the patient's sensory stimulation during isolation. The room environment should be clean and pleasant. Drapes or shades should be opened, and excess supplies and equipment removed. You must listen to the patient's concerns or interests. If you hurry through care or show a lack of interest, the patient will feel rejected and even more isolated. Mealtime is a particularly good opportunity for conversation. Providing comfort measures such as repositioning, a back massage, or a tepid sponge bath increases physical stimulation. If appropriate for the patient's condition, you should encourage the patient to walk and to sit up in a chair. Recreational activities such as board games or cards may be an option to keep the patient mentally stimulated.

You must explain to the family the patient's risk for depression or loneliness. Visiting family members should be taught the principles of isolation and encouraged to avoid expressions or actions that convey revulsion, fear, or disgust. Discuss ways to provide meaningful stimulation.

Protective Environment. Private rooms used for isolation may have negative-pressure airflow to prevent infectious particles from flowing out of the room. Special rooms with positive-pressure airflow are used for highly susceptible patients, such as organ transplant recipients. On the door or wall outside the room, post a card listing the precautions for the isolation category according to your agency's policy. The card is a handy reference for health care workers and visitors, and it alerts anyone who might enter the room that special precautions must be followed.

The isolation room or an adjoining anteroom should contain hand hygiene, bathing, and toilet facilities. Soap and antiseptic solutions must be made available. Personnel and visitors perform hand hygiene before approaching the patient's bedside and again before leaving the room. If toilet facilities are unavailable, special procedures for handling portable commodes, bedpans, or urinals must be followed. Personal protective equipment should be stored in an anteroom between the room and hallway or in a convenient location close to the point of use.

All patient care rooms, including those used for isolation, contain an impervious bag for soiled or contaminated linen as well as a waste receptacle with plastic liners. Impervious receptacles stop the transmission of microorganisms by preventing seepage and soiling of the outside surface. A disposable rigid container should be available in the room for discarding of used needles, syringes, and sharp objects.

You should remain aware of infection prevention and control techniques while working with patients in protected environments. Depending on the microorganism and the mode of transmission, you must evaluate what articles or equipment may be taken into an isolation room. For example, Health Canada (2007) recommends the dedicated use of articles such as stethoscopes, sphygmomanometers, and rectal thermometers in the isolation room of a patient infected or colonized with vanomycin-resistant enterococci (VRE). These devices should not be used on other patients unless the devices are first adequately cleaned and disinfected. If you bring an article into the room, expose the article to infected material, and then touch or remove the article, you increase the risk of transmitting infection to other patients or personnel.

Personal Protective Equipment. Personal protective equipment (gowns, masks, protective eyewear, and gloves) should be readily available. The primary reason for gowning is to

prevent the contamination of clothes during contact with the patient. Gowns and coverups protect health care workers and visitors from coming in contact with infected material, blood, or body fluid. Gowns may also be required for contact precautions, depending on the expected amount of exposure to infectious material. Gowns used for barrier protection are made of a fluid-resistant material and should be changed immediately if damaged or heavily contaminated.

Isolation gowns usually open at the back and have ties or snaps at the neck and waist to keep the gown closed and secure. They should be long enough to cover all outer garments. Long sleeves with tight-fitting cuffs provide added protection. No special technique is required for applying clean gowns as long as they are fastened securely. However, you must be careful when removing a gown to minimize the contamination of your hands and uniform. Isolation gowns are disposable or reusable, depending on your agency's policy.

Full face protection (with eyes, nose, and mouth covered) should be worn when splashing or spraying of blood or body fluid into the face is possible. Masks and eye protection should also be worn when working with a patient placed on droplet precautions; they protect you from inhaling microorganisms from a patient's respiratory tract and prevent the transmission of pathogens from your respiratory tract to the patient. Surgical masks protect a wearer from inhaling large-particle aerosols that travel short distances (2 m). Eye protection protects a wearer from receiving large-particle droplets to the eye. At times, a patient who is susceptible to infection wears a mask to prevent inhalation of pathogens. Patients on droplet or airborne precautions who are transported outside of their rooms should wear masks to protect other patients and personnel. According to the CDC (2007), masks may prevent the transmission of infection through direct contact with mucous membranes. In addition, masks discourage the wearer from touching the eyes, nose, or mouth.

A properly applied mask fits snugly over the mouth and nose so that pathogens and body fluids cannot enter or escape through the sides (Box 32-15). If a person wears glasses, the top edge of the mask fits below the glasses so that the glasses do not cloud over as the person exhales. Talking should be kept to a minimum while wearing a mask to reduce respiratory airflow—a mask that has become moist may not provide a barrier to microorganisms and should be discarded. A mask should never be reused. Patients and family members should be warned that a mask can cause a sensation of smothering. If family members become uncomfortable wearing a mask, they should leave the room and discard the mask.

Specially fitted respiratory protective devices or masks are required when you care for a patient with known or suspected tuberculosis or when the patient has varicella, disseminated zoster, or measles and the worker is not immune. The mask must have a higher filtration rating than the regular surgical mask and be fitted snugly to the wearer's face to prevent leakage around the sides. You should be aware of your agency's policy regarding the type of respiratory protective device required.

Gloves help to prevent the transmission of pathogens by direct and indirect contact. Clean, nonsterile gloves (also called disposable gloves) should be worn when contact with blood, body fluid, secretions, excretions, or contaminated items is possible. Clean gloves should be donned just before you touch mucous membranes and nonintact skin. Gloves should be changed between tasks and procedures on the same patient

► BOX 32-15 Procedural Guideline

Donning a Surgical-Type Mask

Procedure:

1. Find top edge of the mask (usually has a thin metal strip). The pliable metal fits snugly against bridge of nose.
2. Hold the mask by top two strings or loops. Tie the two top ties at the top of back of the head (see Step 2 illustration), with ties above ears (alternative: slip loops over each ear).



Step 2 Tie two top ties at top of back of head.

3. Tie the two lower ties snugly around the neck, with mask well under chin (see Step 3 illustration).



Step 3 Tie two lower ties snugly around the neck.

4. Gently pinch upper metal band around bridge of nose.

Note: Mask should be changed if it becomes wet, moist, or contaminated.

after contact with material that may contain a high concentration of microorganisms. Gloves should be removed promptly after use, before touching noncontaminated items and environmental surfaces, and before going to another patient. Hand hygiene should be performed immediately after removing the gloves to avoid the transfer of microorganisms to other patients and environments. Facilities provide nonlatex gloves for health care staff who are allergic or sensitive to latex. When full protective apparel is needed, you must first perform hand hygiene, apply a mask and eyewear or goggles (as needed), apply a gown, and then put on gloves. Disposable gloves are easily applied and are designed to fit either hand. The glove cuffs should be pulled up over the wrists or over the cuffs of the gown. The gloves' thin rubber can be easily torn; if a break or tear is detected in a glove while providing care, you should change gloves if care is not completed. If you do not plan to have more contact with the patient, reapplying gloves is unnecessary.

Family members visiting patients who are in isolation that necessitates the use of gloves must know when and how to apply gloves properly. You need to demonstrate the application of gloves to family members and explain the reason for glove use. Emphasize the importance of hand hygiene after the removal of gloves.

When participating in a procedure that may create droplets or splashing or spraying of blood or other body fluids, you must wear protective eyewear and a mask or a face shield (CDC, 2007). Examples of such procedures are the irrigation of a large abdominal wound or the insertion of an arterial catheter in which you assist a physician. Eyewear may be available in the form of plastic glasses or goggles. They should fit snugly around the face so that fluids cannot enter between the face and the glasses.

Specimen Collection. Often, many laboratory studies are required when a patient is suspected of having an infectious disease. Body fluids and secretions suspected of containing infectious organisms are collected for culture and sensitivity

tests. The specimen is placed in a medium that promotes the growth of organisms. A laboratory technologist then identifies the microorganisms growing in the culture. Additional test results indicate antibiotics to which the organisms are resistant or sensitive, and sensitivity reports determine the antibiotics to be used in treatment.

You need to obtain all culture specimens using disposable gloves and sterile equipment. Collecting fresh material from the site of the infection, such as wound drainage, ensures that the specimen is not contaminated by neighbouring microbes. All specimen containers should be sealed tightly to prevent spillage and contamination of the outside of the container. Box 32-16 describes the techniques for collecting specimens from a patient with a suspected infection.

Bagging Waste or Linen. You should use special bagging procedures when removing contaminated items from a patient's environment. Bagging contaminated items and ensuring the outside of the bag is not contaminated prevents accidental exposure of personnel and contamination of the surrounding environment.

Health Canada (2007) recommends using a single bag for discarding items if the bag is impervious and sturdy and if the article can be placed in the bag without contaminating the outside of the bag. Soiled linen should be placed in an impervious laundry bag in the patient's room. Health Canada (2007) recommends double bagging *only* if it is impossible to prevent the contamination of the bag's outer surface. Studies have shown that double bagging is otherwise not necessary to control infection (Maki et al., 1986; CDC, 2007). The use of one standard-sized linen bag that is not overfilled, is tied securely, and is intact is adequate to prevent infection transmission. The same rule applies to garbage bags.

Transporting Patients. Before transferring patients to wheelchairs or stretchers, give them clean gowns to serve as robes. Patients infected with organisms transmitted by the airborne route should leave their rooms only for essential purposes, such as diagnostic procedures or surgery. These patients

► BOX 32-16 Specimen Collection Techniques*

Wound Specimen

Clean the site with sterile water or saline before wound specimen collection. Wear gloves and use a cotton-tipped swab or a syringe to collect as much drainage as possible. Set a clean test tube or culture tube on a clean paper towel close by. After swabbing the centre of the wound site, grasp the collection tube by holding it with a paper towel. Carefully insert the swab without touching the outside of the tube. After securing the tube's top, transfer the tube into a bag for transport and then perform hand hygiene.

Blood Specimen

Wearing gloves, use a syringe and culture media bottles to collect up to 10 mL of blood per culture bottle (check your agency's policy about exact amounts required). After prepping the patient, perform a venipuncture at two different sites to decrease the likelihood of both specimens being contaminated with skin flora. Place the blood culture bottles on the bedside table or another surface; swab off the bottle tops with alcohol. Inject the appropriate amount of blood into each bottle. Remove your gloves and transfer the specimen into a clean, labelled bag for transport. Perform handwashing and hand hygiene.

Stool Specimen

Wearing gloves, use a clean cup with sealing top (it does not need to be sterile) and a tongue blade to collect a small amount of stool, approximately the size of a walnut: place the cup on a clean paper towel in the patient's bathroom; using the tongue blade, collect the needed amount of feces from the patient's bedpan; transfer the feces to the cup without touching the cup's outside surface. Dispose of the tongue blade, and place the seal on the cup. Transfer the specimen into a clean bag for transport. Remove your gloves and perform hand hygiene.

Urine Specimen

Wearing gloves, use a syringe and sterile cup or tube to collect 1 to 5 mL of urine. Place the cup or tube on a clean towel in the patient's bathroom. If the patient has a urinary catheter, use the syringe to collect the specimen. If the patient is not catheterized, have the patient follow the procedure to obtain a clean voided specimen (see Chapter 43). Transfer the urine into a sterile container by injecting urine from the syringe or by pouring it from the used collection cup. Secure the top of the container and transfer the specimen into a clean, labelled bag for transport. Remove your gloves and perform hand hygiene.

*Agency policies may differ on the type of containers and amount of specimen material required.

Adapted from Pagana, K. D., & Pagana, T. J. (2010). *Mosby's manual of diagnostic and laboratory tests* (4th ed.). St Louis, MO: Mosby.

must also wear masks. Personnel transporting these patients should also wear barrier protection as needed.

At times, a patient being transported may drain body fluids onto a stretcher or wheelchair. When this occurs, you must be sure to have the equipment cleaned and, if necessary, disinfected after the patient returns to the room. An extra layer of sheets may be used to cover the stretcher or seat of the wheelchair.

Personnel in diagnostic or procedural areas or the operating room should be notified that the patient is on isolation precautions. Record the type of isolation on the patient's chart. Explain to the patient ways that he or she can help prevent the transmission of infection during transport. A patient on airborne

or droplet isolation is provided with a mask and given tissues and a bag to allow for the proper disposal of secretions.

Role of the Infection Control Professional. Many hospitals employ professionals who are specially trained in infection prevention and control; most of these professionals are nurses. These individuals are responsible for advising hospital personnel regarding infection prevention and control and for monitoring infections within the hospital. The Community and Hospital Infection Control Association of Canada (CHICA-Canada) is a voluntary multidisciplinary association of infection control professionals. Its mission is to promote excellence in the practice of infection prevention and control (CHICA-Canada, 2004). The duties of an infection control professional include the following:

- Provide staff with education on infection prevention and control.
- Develop and review infection prevention and control policies and procedures.
- Recommend appropriate isolation procedures.
- Screen patient records for community-acquired infections that may be reportable to the public health department.
- Consult with employee health departments concerning recommendations to prevent and control the spread of infection among personnel, such as tuberculosis testing.
- Gather statistics regarding the **epidemiology** (cause and effect) of HAIs.
- Notify the public health department of incidents of communicable diseases within the facility.
- Confer with all hospital departments to investigate unusual events or clusters of infection.
- Recommend education for patients and families
- Identify infection control problems related to equipment.
- Monitor antibiotic-resistant organisms in the institution.
- Monitor construction sites in hospitals to ensure that appropriate dust containment measures are used.

An infection control professional can be a valuable resource for nurses in controlling nosocomial infections.

Infection Prevention and Control for Hospital Personnel. Health care workers are continually at risk of exposure to infectious microorganisms. Each agency has protocols in place to advise staff and to monitor infection protocols. Hospitals offer regularly scheduled staff education programs. Each province and territory has rules and procedures to ensure that health care workers are not unnecessarily exposed to pathogens.

Patient Education. Often patients must learn to use infection control practices at home (Box 32-17). Preventive technique will become almost second nature to you if practised daily, but your patients will be less aware of factors that promote the spread of infection and ways to prevent its transmission. The home environment does not always lend itself to infection prevention—often you must help patients adapt according to the resources available to maintain hygienic techniques. However, patients in a home care setting generally have a lower risk of infection than do patients in a hospital because they have less exposure to resistant organisms and undergo fewer invasive procedures.

Surgical Asepsis. Surgical asepsis, or sterile technique, requires precautions different from those of medical asepsis. Surgical asepsis includes procedures used to eliminate all microorganisms, including pathogens and spores, from an object or area. In surgical asepsis, an area or object is considered contaminated if touched by any object that is not sterile.

* BOX 32-17 PATIENT TEACHING

Infection Control

Objective

- Patient will perform self-care using proper infection control techniques.

Teaching Strategies

- Instruct the patient about cleaning equipment using soap and water and disinfecting it with an appropriate disinfectant.
- Demonstrate proper hand hygiene, explaining that it should be done before and after all treatments and when infected body fluids are contacted.
- Instruct the patient about the signs and symptoms of wound infection.
- For patients who receive tube feedings at home, explain the importance of preparing enough formula for only eight hours (in the case of commercially prepared foods) or four hours (in the case of home-prepared foods). Tell the patient that contaminated enteral feedings can cause infections. Teach the patient to rinse the feeding bag and tubing with mild soap and water daily and to dry them.
- Instruct the patient to place contaminated dressings and other disposable items containing infectious body fluids in impervious plastic bags and to place needles in a puncture-proof and leak-proof container, such as an empty bleach bottle with the opening taped shut or a coffee can with the lid taped closed. Glass containers should not be used. Ensure that the patient knows to contact the local municipality or public health department before disposing of contaminated items (Health Canada, 2007).

- Instruct the patient (or family) to separate noticeably soiled linen from other laundry, wash it in water that is as hot as the fabric will tolerate, add 250 mL of bleach to detergent, and set the dryer temperature as high as the fabric will allow.



Evaluation

- Ask the patient or family member to describe techniques used to reduce the transmission of infection.
- Ask the patient to demonstrate select techniques.
- Ask the patient to explain the risks for infection based on the condition.

After patients are at home, you need to educate them about infection and techniques to prevent or control its spread, and you need to determine their compliance with infection control practices. Family members caring for patients must be involved in the teaching plan—teach patients and family members a common-sense approach to controlling and preventing infection. Topics to address in a teaching session include the following:

- The patient's susceptibility to infection
- The chain of infection, with specific reference to the means of transmission
- Hygienic practices that minimize organism growth and spread; emphasize handwashing
- Preventive health care (e.g., proper diet, immunizations, and exercise)
- The proper methods for handling and storage of food
- An awareness of family members who are at risk for acquiring infection

While you are working with a sterile field or with sterile equipment, you must understand that the slightest break in technique results in contamination. Surgical asepsis should be used in the following situations:

- During procedures that require the intentional perforation of the patient's skin (e.g., the insertion of intravenous catheters or administration of injections)
- When the skin's integrity is broken as a result of trauma, surgical incision, or burns
- During procedures that involve the insertion of catheters or surgical instruments into sterile body cavities

Although surgical asepsis is commonly practised in the operating room, labour and delivery area, and major diagnostic areas, you may also use surgical aseptic techniques at the patient's bedside, for example, when inserting intravenous or urinary catheters, suctioning the tracheobronchial airway, or reapplying sterile dressings. In an operating room, you must follow a series of steps to maintain sterile technique, including applying a mask, protective eyewear, and a cap; performing a surgical hand scrub; and applying a sterile gown and gloves. In contrast, when performing a dressing change at a patient's bedside, you may only perform hand hygiene and apply sterile gloves (see Principles of Surgical Asepsis section). When using the principles of surgical asepsis, remember you are trying to prevent infections. For more information on infection control, see Box 32-18.

Patient Preparation. Because surgical asepsis necessitates exact techniques, you must have the patient's cooperation. Therefore, you must prepare the patient before any procedure. Some patients may fear moving or touching objects during a sterile procedure, but others may try to assist. You

need to explain how a procedure is to be performed and what the patient can do to avoid contaminating sterile items, including the following:

- Avoid sudden movements of body parts covered by sterile drapes.
- Refrain from touching sterile supplies, drapes, or the nurse's gloves and gown.
- Avoid coughing, sneezing, or talking over a sterile area.

Certain sterile procedures may take an extended period of time. You should assess the patient's needs and anticipate factors that may disrupt a procedure. If a patient is in pain, try to administer analgesics no more than half an hour before a sterile procedure begins. Give the patient the opportunity to void. Often patients must assume uncomfortable positions during sterile procedures. Help the patient to assume the most comfortable position possible. Finally, the patient's condition may result in actions or events that contaminate a sterile field. For example, a patient with a respiratory infection transmits organisms by coughing or breathing; you need to anticipate such a problem and offer the patient a mask.

Principles of Surgical Asepsis. When beginning a surgically aseptic procedure, you must follow certain principles to ensure the maintenance of asepsis. Failure to follow these principles places patients at risk for infection. The following principles are important:

1. *A sterile object remains sterile only when touched by another sterile object.* This principle guides you in the placement of sterile objects and how to handle them.
 - A. Sterile objects that touch sterile objects remain sterile; for example, sterile gloves are worn or sterile forceps are used to handle objects on a sterile field.

► BOX 32-18 Surgical Asepsis: Infection Control

Objective

- The goal of surgical asepsis or aseptic technique is to prevent microorganisms from becoming introduced to a susceptible site. It should also prevent transmission of microorganisms to other patients or to staff.

Principles

- Ensure that all required supplies are gathered and that there is a clear and dry field to carry out the procedure.
 - Movement within or around a sterile field should be done in a manner that does not contaminate the sterile field.
 - Sterile fields should be prepared as close to the time of use as possible; the potential for environmental contamination from dust and particles in the ambient environment that settle on surfaces increases over time.
 - Conversation in a sterile field should be kept to a minimum to reduce contamination by means of respiratory droplets.
 - Perform hand hygiene prior to setting up a sterile field.
 - Ensure the sterile barrier covering the supplies is intact, with no punctures or evidence of moisture damage.
 - If there is any question of the item's sterility, the item must be considered unsterile.
 - Open sterile packs carefully to prevent contamination of the contents of the pack.
 - All items in a sterile field must be sterile.
 - Once a sterile package is opened, a 2.5 cm border around the edges is considered unsterile.
 - Pour solutions into receptacles on the sterile field slowly to avoid splashing. Splashing can cause strike-through or splash-back from nonsterile surfaces to the sterile field.
 - An object is considered to be no longer sterile if it is below a person's waist or if it is out of the range of vision.
 - Wear sterile gloves for the procedure to prevent the introduction of microorganisms to the site and to protect the wearer from coming into contact with body fluids.
- B. Sterile objects that touch clean objects become contaminated; for example, if the tip of a syringe or other sterile object touches the surface of a clean disposable glove, the object is contaminated.
 - C. Sterile objects that touch contaminated objects become contaminated; for example, when you touch a sterile object with an ungloved hand, the object is contaminated.
 - D. Sterile objects that touch questionable objects are considered contaminated; for example, when a tear or break in the covering or packaging of a sterile object is found, the object is discarded regardless of whether the object itself appears untouched.
2. *Only sterile objects may be placed on a sterile field.* All items are properly sterilized before use. Sterile objects are kept in clean, dry storage areas. The package or container holding a sterile object must be intact and dry—a package that is torn, punctured, wet, or open is considered to be contaminated.
 3. *A sterile object or field out of the range of vision or an object held below a person's waist is contaminated.* You must never turn your back on a sterile tray or leave it unattended. Contamination can occur accidentally by a dangling piece of clothing, falling hair, or an unknowing patient touching a sterile



Figure 32-2 Placing sterile item on a sterile field.

object. Any object held below waist level is considered contaminated because it cannot be viewed at all times. Sterile objects should be kept in front of you with your hands as close together as possible.

4. *A sterile object or field becomes contaminated by prolonged exposure to air.* You need to avoid activities that may create air currents, such as excessive movements or rearranging linen after a sterile object or field becomes exposed. When sterile packages are being opened, it is important to minimize the number of persons walking into the area. Microorganisms travel by droplet through the air; therefore, no one should talk, laugh, sneeze, or cough over a sterile field or when gathering and using sterile equipment. Microorganisms travelling through the air can fall on sterile items or fields if you reach over the work area. When opening sterile packages, hold the item or piece of equipment as close as possible to the sterile field without touching the sterile surface. Keeping the movement or rearranging of sterile items to a minimum also reduces contamination by air transmission.
5. *When a sterile surface comes in contact with a wet, contaminated surface, the sterile object or field becomes contaminated by capillary action.* If moisture seeps through a sterile package's protective covering, microorganisms travel to the sterile object. When stored sterile packages become wet, you must discard the objects immediately or send the equipment for resterilization. When working with a sterile field or tray, you may have to pour sterile solutions. Any spill can be a source of contamination unless the object or field rests on a sterile surface that cannot be penetrated by moisture. Urinary catheterization trays contain sterile supplies that rest in a sterile, plastic container. In this example, sterile solutions spilled within the container will not contaminate the catheter or other objects. In contrast, if you place a piece of sterile gauze in its wrapper on a patient's bedside table and the table surface is wet, the gauze is considered contaminated.
6. *Fluid flows in the direction of gravity.* A sterile object becomes contaminated if gravity causes a contaminated liquid to flow over the object's surface. To avoid contamination during a surgical hand scrub, hold your hands above the elbows. This allows water to flow downward without contaminating your hands and fingers. This is also the reason for drying from the fingers to elbows with hands held up, after the scrub.
7. *The edges of a sterile field or container are considered to be contaminated.* Frequently, sterile objects are placed on a sterile towel or drape (Figure 32-2). Because the edge of the drape

touches an unsterile surface, such as a table or bed linen, a 2.5-cm border around the drape is considered contaminated. Objects placed on the sterile field must be inside this border. The edges of sterile containers become exposed to air after they are open and are thus contaminated. After a sterile needle is removed from a container, the objects must not touch the container's edge. The lip of an opened bottle of solution also becomes contaminated after it is exposed to air. When pouring a sterile liquid, first pour a small amount of solution to wash away microorganisms on the bottle lip. This small amount of solution is then discarded; pour a second time on the same side to fill a container with the desired amount of solution.

Performing Sterile Procedures. All necessary equipment should be assembled before a procedure so that you avoid having to leave a sterile area to obtain equipment. A few extra supplies should be available in case objects accidentally become contaminated. Before the sterile procedure, each step should be explained so that the patient can cooperate fully. If an object becomes contaminated during the procedure, you should discard it immediately.

Donning and Removing Caps, Masks, and Eyewear. For sterile procedures on a general nursing division, you may wear a surgical mask and eyewear without a cap. Eyewear is worn as a part of standard precautions or routine practices if fluid or blood could splash into your eyes. For sterile surgical procedures, you must first apply a clean cap that covers all the hair and then put on the surgical mask and eyewear. The mask must fit snugly around the face and nose to prevent contamination by droplet nuclei. After a mask is worn for several hours, the area over the mouth and nose often becomes moist. Because moisture promotes the spread of microorganisms, the mask should be changed if it becomes moist.

Protective glasses or goggles should fit snugly around the forehead and face to fully protect the eyes. Eyewear needs to be worn only for procedures that create the risk of body fluids splashing into the eyes.

Before removing a mask, eyewear, and cap, remove the gloves to prevent contamination of the hair, neck, and facial area. After untying the mask, hold it by the ties and discard it with the cap. Masks should not be worn hanging from the neck after removal from the face. Eyewear is removed and cleaned later for reuse. After removing all protective wear, perform handwashing and hand hygiene thoroughly.

Opening Sterile Packages. Sterile items such as syringes, gauze dressings, and catheters are packaged in paper or plastic containers that are impervious to microorganisms as long as they are dry and intact. Some institutions wrap reusable supplies in a double thickness of paper, linen, or muslin. These packages are permeable to steam and thus allow for steam autoclaving. Sterile items are kept in clean, enclosed storage cabinets and are separated from nonsterile equipment.

Sterile supplies carry chemical tapes indicating that a sterilization process has taken place. The tapes change colour during the sterilization process; if the tapes do not change colour, the item is not sterile. A sterile item should never be used if the integrity of the packaging is compromised. Health care facilities may apply the date processed and a lot number to the item after processing ("event-related expiration"), or they may apply an expiration date ("date-related expiration") to the item. With either system, it is important for you to check the integrity of the packaging before using an item.



Figure 32-3 Opening a sterile package on a cleaned work area above waist level.

Before opening a sterile item, perform thorough handwashing and hand hygiene. Inspect the supplies for package integrity and sterility and assemble the supplies in the work area, such as the bedside table or treatment room, before opening the packages. A cleaned bedside table or countertop provides a large, clean working area for opening items. The work area should be above waist level. Sterile supplies should not be opened in a confined space where a dirty object might fall on or strike them.

Opening a Sterile Item on a Flat Surface. Sterile packaged items must be opened without contaminating the contents. Commercially packaged items are usually designed so that you have to tear away or separate only the paper or plastic cover. The item is held in one hand while the wrapper is pulled away with the other (Figure 32-3). Take care to keep the inner contents sterile before use. When opening items processed by the facility and packed in paper or linen, observe the following steps:

1. Place the item flat in the centre of the work surface.
2. Remove the sterilization tape or seal.
3. Grasp the outer surface of the tip of the outermost flap.
4. Open the outer flap away from the body, keeping the arm outstretched and away from the sterile field (Figure 32-4, A).
5. Grasp the outside surface of the first side flap.
6. Open the side flap, allowing it to lie flat on the table surface. Keep your arm to the side and not over the sterile surface (see Figure 32-4, B). Do not allow the flaps to spring back over the sterile contents.
7. Grasp the outside surface of the second side flap and allow it to lie flat on the table surface (see Figure 32-4, C).
8. Grasp the outside surface of the last and innermost flap.
9. Stand away from the sterile package and pull the flap back, allowing it to fall flat on the surface (see Figure 32-4, D).
10. Use the inner surface of the package (except for the 2.5-cm border around the edges) as a sterile field to add additional sterile items. The 2.5-cm border can be grasped to manoeuvre the field on the table surface.

If the sterile supplies are not for immediate use, you can close the sterile package. In this case, touch only the wrapper's outside surface. To close a package, the order of unwrapping is reversed, and you should not touch the inside contents or reach over the field.

Opening a Sterile Item While Holding It. To open a small, sterile item, hold the package in your nondominant hand. Using the dominant hand, carefully open the side and top flaps away from the enclosed sterile item in the order previously mentioned. Open the item in a hand so that the item can be

handed to a person wearing sterile gloves or transferred to a sterile field.

Preparing a Sterile Field. When performing sterile procedures, you need a sterile work area that provides room for the handling and placing of sterile items. A **sterile field** is an area

free of microorganisms and prepared to receive sterile items. The field may be prepared by using the inner surface of a sterile wrapper as the work surface or by using a sterile drape or dressing tray. Skill 32-2 describes preparation of a sterile field. After the surface for the field is created, add sterile items

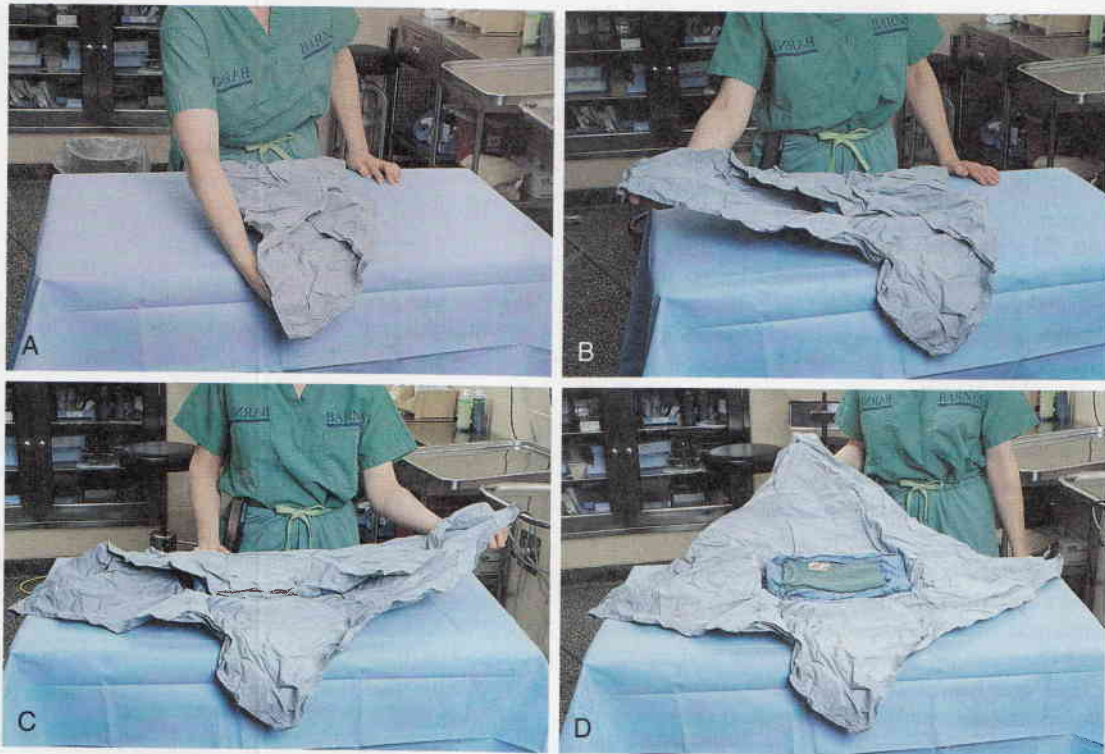


Figure 32-4 Opening sterile packaged items on a flat surface. **A**, Open the top flap away from the body. **B**, Keep your arm away from the sterile field while opening the side flap. **C**, Open the second side flap. **D**, Open the back flap.

► SKILL 32-2 Preparation of a Sterile Field

video

Delegation Considerations

Delegation of the preparation of a sterile field is inappropriate unless you are delegating to an unregulated care provider (UCP) who has received specialized training. Operating room technicians are usually trained for this skill.

Procedure

STEPS

1. Prepare sterile field just before planned procedure. Supplies are to be used immediately.
2. Select clean work surface above waist level.
3. Assemble necessary equipment.
4. Check dates or labels on supplies for sterility of equipment.
5. Perform handwashing and hand hygiene thoroughly. Option: Procedure may be performed with gloves on.
6. Place pack containing sterile drape on work surface and open as described in Figure 32-4.
7. With fingertips of one hand, pick up folded top edge of sterile drape.
8. Gently lift drape up from its outer cover and let it unfold by itself without touching any object. Discard outer cover with your other hand.

Equipment

- Sterile drape
- Assorted sterile supplies

RATIONALE

- Prevents exposure of sterile field and supplies to air and contamination.
- A once-sterile object held below waist is considered contaminated.
- Preparation of equipment in advance prevents a break in the technique.
- Equipment stored beyond expiration date is considered unsterile.
- Reduces microbial counts on skin.
- Ensures sterility of packaged drape.
- The 2.5 cm border around drape is unsterile and may be touched with fingers or clean gloves.
- If sterile object touches any nonsterile object, it becomes contaminated.

► SKILL 32-2 Preparation of a Sterile Field—cont'd

9. With your other hand, grasp adjacent corner of drape and hold it straight up and away from your body (see Step 9 illustration).
10. Holding drape, first position and lay bottom half over intended work surface (see Step 10 illustration).



Step 9 Hold drape straight up and away from body.

11. Allow top half of drape to be placed over work surface last (see Step 11 illustration).
12. Grasp 2.5 cm border around edge to position as needed.

Adding Sterile Item

13. Open sterile item (according to package directions) while holding outside wrapper in nondominant hand.
14. Carefully peel wrapper onto nondominant hand. Do not shake item onto sterile field.
15. Being sure wrapper does not fall down on sterile field, place item onto field at angle. Do not hold arm over sterile field (see Step 15 illustration).



Step 11 Place top half of drape over work surface.

16. Dispose of outer wrapper.
17. Perform procedure using sterile technique.

- Drape can now be properly placed while using two hands. Drape must be held away from unsterile surfaces.
- Prevents you from reaching over sterile field.



Step 10 Lay bottom half of drape over work surface.

- Creates flat sterile work surface.
- Assists in differentiating and organizing the sterile surface.
- Frees dominant hand for unwrapping outer wrapper.
- Item remains sterile.
- Prevents reaching over field and contaminating its surface.



Step 15 Adding item to sterile field.

- Prevents accidental contamination of sterile field.
- Prevents transmission of infection to patient.

Recording and Reporting

- It is not necessary to record or report this procedure.

by carefully placing them directly on the field or by transferring them with a sterile forceps. A sterile object that comes in contact with the 2.5-cm border must be discarded.

You may choose to wear sterile gloves while preparing items on the field. If this is done, you can touch the entire drape, but sterile items must be handed over by an assistant. Your gloves cannot touch the wrappers of sterile items.

Pouring Sterile Solutions. Often you must pour sterile solutions into sterile containers. A bottle containing a sterile solution is sterile on the inside and contaminated on the outside; the outside neck of the bottle is also contaminated, but the inside of the bottle cap is considered sterile. After the cap or lid is removed, it is held in the hand or placed sterile side (inside) up on a clean surface. This means that the inside of the lid can be seen as it rests on the table surface. A bottle cap or lid should never rest on a sterile surface, even though the inside of the cap is sterile. The outer edge of the cap is unsterile and would contaminate the sterile surface. Likewise, placing a sterile cap down on an unsterile surface increases the chances of the inside of the cap becoming contaminated.

You need to check the label of the bottle to ensure it is the correct solution. Then hold the bottle with its label in the palm of the hand to prevent the possibility of the solution wetting and fading the label. Before pouring the solution into the container, pour a small amount (1 to 2 mL) into a disposable cap or plastic-lined waste receptacle. The discarded solution cleans the lip of the bottle. The edge of the bottle is kept away from the edge or inside of the receiving container. Pour the solution slowly to avoid splashing the underlying drape or field. The bottle should never be held so high above the container that even slow pouring will cause splashing. The bottle should be held outside the edge of the sterile field.

Surgical Scrub. Patients undergoing operative procedures are at an increased risk for infection. When working in operating rooms, you must perform surgical hand antisepsis to decrease and suppress the growth of skin microorganisms, in case your glove tears (Operating Room Nurses Association of Canada [ORNAC], 2003).

During surgical hand antisepsis before an operation, scrub from your fingertips to your elbows with an antiseptic soap. The optimum duration of the surgical hand scrub is unclear, although research indicates that it may be dependent on the type of antimicrobial product. Either an antimicrobial surgical scrub agent intended for surgical hand antisepsis or an alcohol-based antiseptic surgical hand rub that has persistent and cumulative activity is acceptable to use as a surgical scrub. For a traditional scrub, a three- to five-minute scrub should be performed to allow adequate contact time with the product, using the manufacturer's written instructions (Association of periOperative Registered Nurses [AORN], 2010; Meeker & Rothrock, 1999). You should follow your agency's policy for length of scrub time. A study by Gupta et al. (2007) suggested that neither a brush nor a sponge is necessary to reduce bacterial counts on the hands, especially when an alcohol-based product is used.

For maximum elimination of bacteria, all jewellery should be removed, including wristwatches, and the nails should be kept clean and short (AORN, 2010). Artificial nails should not be worn because they may harbour a greater number of bacteria. Similarly, nail polish should be avoided because it conceals soil under the nails and because chipped nail polish may increase the bacterial load (Health Canada, 2007). Freshly applied polish (not chipped or worn for more than four days) may be acceptable, if permitted by your facility's policy (CDC, 2007). If you have active skin infections, open lesions or cuts, or respiratory infections, you should be excluded from the surgical team. Skill 32-3 describes the steps for surgical hand hygiene.

Applying Sterile Gloves. Sterile gloves are an additional barrier to bacterial transfer. If you work on general nursing divisions, use *open gloving* before procedures such as dressing changes and urinary catheter insertions. *Closed gloving*, which is performed after you apply sterile gowns, is practised in operating rooms and special treatment areas. Skills 32-4 and 32-5 review the steps of each sterile gloving technique. The

Text continued on p. 659

► SKILL 32-3 Surgical Handwashing/Hand Hygiene: Preparing for Gowning

Delegation Considerations

The role of the scrub nurse can be delegated to a surgical technologist or licensed practical nurse. UCPs can help the registered nurse in the circulating nurse role by opening sterile supplies, setting up sterile fields, and running errands under the direction of the registered nurse.

Equipment

- Deep sink with foot or knee controls for dispensing water and soap (faucets should be high enough for hands and forearms to fit comfortably)
- Antimicrobial surgical scrub agent or alcohol-based waterless antiseptic, according to agency policy (product should be nonirritating, broad spectrum, fast acting, and effective in reducing skin microorganisms and have a residual effect) (Association of periOperative Registered Nurses [AORN], 2010; ORNAC, 2003)
- Surgical scrub sponge (if using traditional surgical hand scrub) and a disposable nail cleaner
- Paper mask and cap or hood
- Sterile towel
- Proper scrub attire
- Protective eyewear (glasses or goggles)

Procedure

STEPS

1. Consult your agency's policy regarding required length of scrub time and antiseptic to use for hand antisepsis.

RATIONALE

- Guidelines vary regarding ideal time needed and antiseptic to use for surgical scrub.

► SKILL 32-3 Surgical Handwashing/Hand Hygiene: Preparing for Gowning—cont'd

2. Be sure fingernails are short, clean, and healthy. Artificial nails should be removed. Natural nails should be less than 0.5 cm long.

- Long nails and chipped or old polish increase number of bacteria residing on nails. Long fingernails can puncture gloves, causing contamination. Artificial nails are known to harbour Gram-negative microorganisms and fungus (WHO, 2005).

Critical Decision Point: Remove nail polish if chipped or worn longer than four days because it may harbour microorganisms (AORN, 2004; ORNAC, 2003).

3. Inspect hands for presence of abrasions, cuts, or open lesions.

- These conditions increase the likelihood of microorganisms residing on skin surfaces.
- Mask prevents escape into air of microorganisms that can contaminate hands. Other protective wear prevents exposure to blood and body fluid splashes during the procedure.

5. Surgical handwashing:

A. Turn on water using knee or foot controls.

B. Wet hands and arms under running water and lather with detergent to 5 cm above elbows. (Hands need to be above elbows at all times.)

C. Rinse hands and arms thoroughly under running water.

Remember to keep hands above elbows.

D. Under running water, clean under nails of both hands with nail pick. Discard after use (see Step 5D illustration).

E. Wet clean sponge and apply antimicrobial detergent. Scrub nails of one hand with 15 strokes. Holding sponge perpendicular, scrub palm, each side of thumb and fingers, and posterior side of hand with 10 strokes each. The arm is mentally divided into thirds, and each third is scrubbed 10 times (see Step 5E illustrations). The duration of scrub is determined by the manufacturer's recommendations for the scrub agent used, which is usually 2 to 6 minutes (ORNAC, 2003). Rinse sponge and repeat sequence for other arm. A two-sponge method may be substituted. Check your agency's policy.

- Water runs by gravity from fingertips to elbows flowing from least to most contaminated areas. Hands become cleanest part of upper extremity. Washing a wide area reduces risk of contaminating overlying gown that you later apply.
- Rinsing removes transient bacteria from fingers hands and forearms.
- Removes dirt and organic material that harbour large numbers of microorganisms.
- Friction loosens resident bacteria that adhere to skin surfaces. Technique ensures coverage of all surfaces. Scrubbing is performed from cleanest area (hands) to marginal area (upper arms).



Step 5D Clean under fingernails.



A



B

Step 5E A, Scrub side of fingers. B, Scrub forearms.

Continued

► SKILL 32-3 Surgical Handwashing/Hand Hygiene: Preparing for Gowning—cont'd

- F. Discard sponge and rinse hands and arms thoroughly (see Step 5F illustration). Turn off water with foot or knee control and back into room entrance with hands elevated in front of and away from the body.



Step 5F Rinse arms.

- After touching skin, the sponge is considered contaminated. Rinsing removes resident bacteria. Using foot or knee tap control and backing into room prevents accidental contamination.

- G. Walk up to sterile tray and lean forward slightly to pick up a sterile towel (see Step 5G illustration). Dry one hand thoroughly, moving from fingers to elbow. Dry in a rotating motion. Dry from cleanest to least clean area (see Step 5G illustration).

- Drying prevents chapping and facilitates donning of gloves. Leaning forward prevents accidental contact of arms with scrub attire.



Step 5G A, Grasping sterile towel. B, Drying sequence.

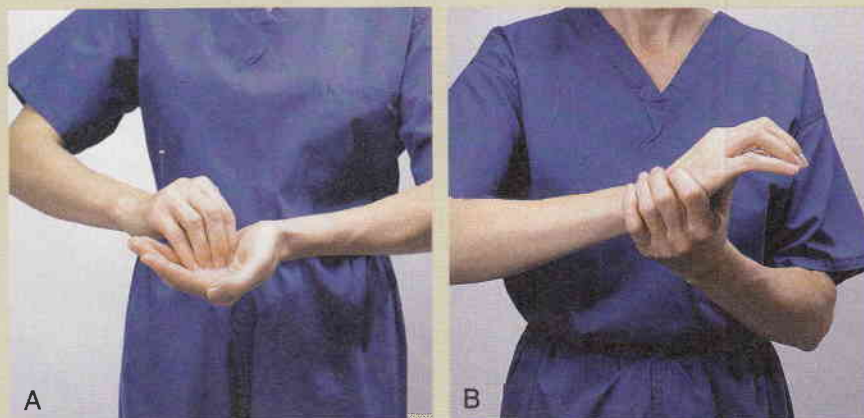
- H. Repeat drying method for other hand by carefully reversing towel or using a new sterile towel.
- I. Discard towel.
- J. Proceed with sterile gowning (see Skill 32-4).
6. Alternative method of surgical hand hygiene using alcohol-based antiseptic:
- A. Wash hands with soap and water for at least 15 seconds to remove soil.
- B. Under running water, clean under nails of both hands with disposable nail cleaner. Discard after use and dry hands with paper towel.

- Prevents accidental contamination.
- Prevents accidental contamination.
- Removes dirt and organic material that harbour large numbers of microorganisms.

► SKILL 32-3 Surgical Handwashing/Hand Hygiene: Preparing for Gowning—cont'd

C. Apply enough alcohol-based waterless antiseptic to one palm to cover both hands thoroughly (see Step 6C illustration). Spread the antiseptic over all surfaces of the hands and fingernails. Follow product instructions for length of time to rub over hand surfaces. Allow to air-dry.

- Ensures coverage of all surfaces. Air-drying ensures complete antiseptics is achieved.



Step 6C Application of antimicrobial agent for brushless hand scrub. This nurse is using 3M Avagard. **Source:** Photo courtesy of 3M Health Care.

D. Repeat the process and allow hands to air-dry before applying sterile gloves.

Recording and Reporting

- It is not necessary to record or report this procedure.
- Report any dermatitis to employee health or infection control per your agency's policy.

► SKILL 32-4 Applying a Sterile Gown and Performing Closed Gloving

Delegation Considerations

The role of the scrub nurse can be delegated to a surgical technician.

Equipment

- Surgical cap
- Surgical mask
- Eyewear
- Foot covers
- Sterile gown (prepared by circulating nurse)

Procedure

STEPS

1. Before entering operating room or treatment area, apply cap, face mask, and eyewear. Foot covers are also required in operating room.
2. Perform thorough surgical hand hygiene (see Skill 32-3).
3. Ask circulating nurse to assist by opening sterile pack containing sterile gown (folded inside out).
4. Have circulating nurse prepare glove package by peeling outer wrapper open while keeping inner contents sterile. Inner glove package is then placed on sterile field created by sterile outer wrapper.
5. Reach down to sterile gown package; lift folded gown directly upward and step back away from table.
6. Holding folded gown, locate neckband. With both hands, grasp inside front of gown just below neckband.
7. Allow gown to unfold, keeping inside of gown toward body. Do not touch outside of gown with bare hands or allow it to touch the floor.

RATIONALE

- Prevent hair and air droplet nuclei from contaminating sterile work areas. Eyewear protects mucous membranes of eye. Foot covers are paper or cloth and fit over work shoes.
- Remove transient and resident bacteria from fingers hands and forearms.
- Gown's outer surface remains sterile.
- This action keeps gloves sterile and allows nurse who has scrubbed to handle sterile items.
- This action provides wide margin of safety, avoiding contamination of gown.
- Clean hands may touch inside of gown without contaminating outer surface.
- Outside of gown will remain sterile surface.

Continued

► SKILL 32-4 Applying a Sterile Gown and Performing Closed Gloving—cont'd

8. With hands at shoulder level, slip both arms into armholes simultaneously (see Step 8 illustration). Ask circulating nurse to bring gown over shoulders by reaching inside to arm seams and pulling gown on, leaving sleeves covering hands.
9. Have circulating nurse securely tie back of gown at neck and waist (see Step 9 illustration). (If gown is a wraparound style, sterile flap to cover gown is not touched until you have gloved.)



Step 8 Place arms in sleeves.



Step 9 Circulating nurse ties scrub gown.

10. Closed gloving:

- A. With hands covered by gown sleeves, open inner sterile glove package (see Step 10A illustration).
- B. With dominant hand inside gown cuff, pick up glove for nondominant hand by grasping folded cuff.
- C. Extend nondominant forearm with palm up and place palm of glove against palm of nondominant hand. Glove fingers will point toward elbow.
- D. Grasp back of glove cuff with covered dominant hand and turn glove cuff over end of nondominant hand and gown cuff (see Step 10D illustration).

- Hands remain clean. Sterile gown cuff will touch sterile glove surface.
- Sterile gown touches sterile glove.
- Position glove for application over cuffed hand, keeping glove sterile.
- Seal that is created by glove cuff over gown prevents exit of microorganisms over operative sterile field.



Step 10A Open glove package.



Step 10D Apply glove to left hand, keeping right hand inside cuff.

- E. Grasp top of glove and underlying gown sleeve with covered dominant hand. Carefully extend fingers into glove, being sure glove's cuff covers gown's cuff.

► SKILL 32-4 Applying a Sterile Gown and Performing Closed Gloving—cont'd

F. Glove dominant hand in same manner, reversing hands (see Step 10F illustration). Use gloved nondominant hand to pull on glove. Keep hand inside sleeve (see Step 10F illustration).

- Sterile object touches sterile object and therefore stays sterile. Touching the sterile sleeve with the sterile gloved hand allows the gloved hands to remain sterile.



Step 10F Apply second glove.

G. Be sure fingers are fully extended into both gloves.

11. For wraparound sterile gowns, take gloved hand and release fastener or ties in front of gown.
12. Hand tie to sterile team member, who stands still (see Step 12 illustration). Allowing margin of safety, turn around to the left, covering back with extended gown flap. Take back tie from team member and secure tie to gown.

- Ensure that you have full dexterity while using gloved hand.
- Front of gown is sterile.
- Contact with team member could contaminate gown and gloves. Gown must enclose undergarments.



Step 12 Hand tie to sterile team member.

Recording and Reporting

- It is not necessary to record or report this procedure.

► SKILL 32-5 Open Gloving

video

Delegation Considerations

Delegation of open gloving depends on whether a UCP has received special training and is competent to perform the sterile procedure.

Procedure

STEPS

1. Perform thorough handwashing and hand hygiene.
2. Remove outer glove package wrapper by carefully separating and peeling apart sides.

Equipment

- Sterile gloves (proper size)

RATIONALE

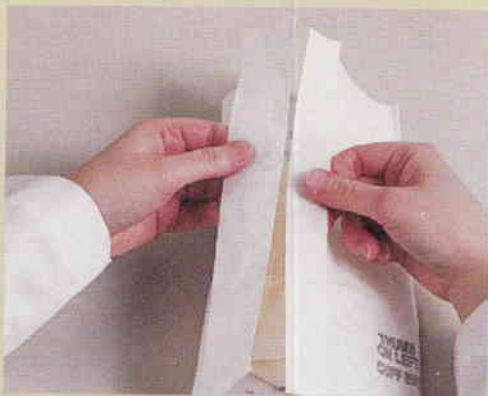
- Removes bacteria from skin surfaces and reduces risk of transmitting infection.
- Prevents inner glove package from accidentally opening and touching contaminated objects.

Continued

► SKILL 32-5 Open Gloving—cont'd

video

3. Grasp inner package and lay it on clean, dry, flat surface just above waist level. Open package, keeping gloves on wrapper's inside surface (see Step 3 illustration).



Step 3 Open package.

4. If gloves are not prepowdered, take packet of powder and apply lightly to hands over sink or wastebasket.
5. Identify right and left gloves. Each glove has cuff approximately 5 cm wide. Glove dominant hand first.
6. With thumb and first two fingers of nondominant hand, grasp edge of cuff of glove for dominant hand. Touch only glove's inside surface.
7. Carefully pull glove over dominant hand, being sure cuff does not roll up wrist. Be sure thumb and fingers are in proper spaces (see Step 7 illustration).
8. With gloved dominant hand, slip fingers underneath second glove's cuff (see Step 8 illustration).

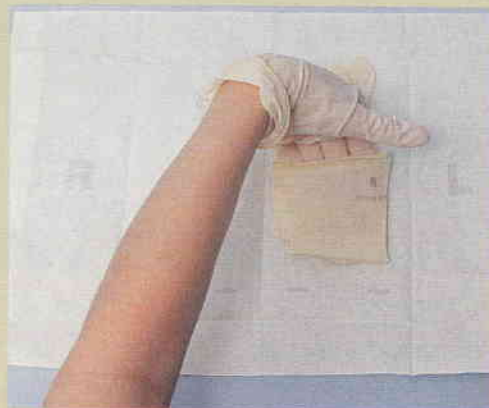


Step 7 Pull glove over dominant hand.

9. Carefully pull second glove over nondominant hand. Do not allow fingers and thumb of gloved dominant hand to touch any part of exposed nondominant hand. Keep thumb of dominant hand abducted back (see Step 9 illustration).

- Sterile object held below waist is contaminated. Inner surface of glove package is sterile.

- Powder allows gloves to slip on easily. (Some staff members do not use powder for fear of promoting growth of microorganisms.)
- Proper identification of gloves prevents contamination by improper fit. Gloving of dominant hand first improves dexterity.
- Inner edge of cuff will lie against skin and is thus not sterile.
- If glove's outer surface touches hand or wrist, then it is contaminated.
- Cuff protects gloved fingers. Sterile surface touching sterile surface prevents glove contamination.



Step 8 Slip fingers underneath second glove's cuff.

- Contact of gloved hand with exposed hand results in contamination.

► SKILL 32-5 Open Gloving—cont'd

10. After second glove is on, interlock hands. The cuffs usually fall down after application. Be sure to touch only sterile sides (see Step 10 illustration).



Step 9 Pull second glove over nondominant hand.

Glove Disposal

11. Grasp outside of one cuff with other gloved hand; avoid touching wrist.
12. Pull glove off, turning it inside out. Discard in receptacle.
13. Take fingers of bare hand and tuck inside remaining glove cuff. Peel glove off, inside out. Discard in receptacle. Perform hand hygiene.

Recording and Reporting

- It is not necessary to record or report this procedure.

- Ensure smooth fit over fingers.



Step 10 Interlock hands. Gloved hands must be kept above waist level within the visual field at all times or clasped together above elbow level.

- Minimize contamination of underlying skin.
- Outside of glove does not touch skin surface.

proper glove size should be selected; the glove should not stretch so tightly that it can easily tear, yet it should be tight enough that objects can be picked up easily.

Donning a Sterile Gown. You must wear a sterile gown when assisting at the sterile field in an operating room, delivery room, or special treatment areas so that sterile objects can be comfortably handled with less risk of contamination. If you are the circulating nurse, you do not usually wear a sterile gown. The sterile gown acts as a barrier to decrease the shedding of microorganisms from skin surfaces into the air, thus preventing wound contamination. You may also wear a sterile gown if you are caring for a patient with a large open wound or assisting a physician during a major invasive procedure (e.g., inserting an arterial catheter).

After you have applied a mask and surgical cap and performed surgical handwashing, you apply a sterile gown. Pick up the gown from a sterile pack, or ask an assistant to hand the gown to you. Only a certain portion of the gown—the area from the anterior waist to, but not including, the collar and the anterior surface of the sleeves—is considered sterile. The back of the gown, the area under the arms, the collar, the area below the waist, and the underside of the sleeves are not sterile because you cannot keep these areas in constant view and ensure their sterility. Skill 32-4 reviews the steps for applying a sterile gown and closed gloving, and Skill 32-5 reviews the method of open gloving.

❖Evaluation

Your success when practising infection control techniques is measured by determining whether the goals for reducing

or preventing infection are achieved. By comparing the patient's response, such as the absence of fever or development of wound drainage, with expected outcomes, you determine the success of nursing interventions. Similarly, you determine whether interventions should be revised or eliminated. Correctly assessing wounds for healing and conducting a physical assessment of body systems (see Chapter 31) are important skills in evaluation. You need to closely monitor patients, especially those at risk, for signs and symptoms of infection. For example, a patient who has undergone a surgical procedure is at risk for infection at the surgical site, as well as at sites of invasive procedures such as a venipuncture or central line insertion. In addition, the patient is at risk for a respiratory tract infection as a result of decreased mobility and for a urinary tract infection if an in-dwelling catheter is present. You must closely monitor all invasive and surgical sites for swelling, erythema, and purulent drainage. Breath sounds are monitored for changes, and sputum character is checked for purulence. Laboratory test results are reviewed for leukocytes in the urine, which may indicate a urinary tract infection. The absence of signs or symptoms of infection is the expected outcome of infection prevention and monitoring activities.

The patient at risk for infection must understand the measures needed to reduce or prevent microorganism growth and spread. Providing patients or family members with the opportunity to discuss infection control measures and to demonstrate procedures will increase their ability to comply with therapy. You may determine that patients require new information or that previously instructed information needs reinforcement.

You need to document the patient's response to therapies for infection control. A clear description of any signs and symptoms of systemic or local infection is necessary to give all nurses a baseline for comparative evaluation. The efficacy of any intervention in reducing infection must be reported.

❖ KEY CONCEPTS

- Hand hygiene is the most important technique to use in preventing and controlling the transmission of infection.
- The potential for microorganisms to cause disease depends on the number of organisms, their virulence, their ability to enter and survive in a host, and the susceptibility of the host.
- Normal body flora help to resist infection by releasing antibacterial substances and inhibiting the multiplication of pathogenic microorganisms.
- The signs of local inflammation and infection are identical.
- An infection can develop as long as the six elements making up the chain of infection are uninterrupted.
- Microorganisms are transmitted by direct and indirect contact, droplets, airborne particles, and contaminated vehicles and vectors.
- Advancing age, poor nutrition, stress, diseases of the immune system, chronic disease, and treatments or conditions that compromise the immune response increase a person's susceptibility to infection.
- The major sites for HAI are the urinary and respiratory tracts, the bloodstream, and surgical or traumatic wounds.
- The CDC now recommends the use of alcohol-based waterless antiseptics as an alternative to handwashing to more effectively reduce the transmission of pathogens.
- Invasive procedures, medical therapies, long hospitalization, and contact with health care personnel increase a hospitalized patient's risk for acquiring an HAI.
- Isolation practices may prevent personnel and patients from acquiring infections and may prevent the transmission of microorganisms.
- Standard precautions or routine practices entail the use of generic barrier techniques in the care of all patients.
- Transmission-based (isolation) precautions are used for patients with specific, highly transmissible infections.
- Proper cleansing necessitates the mechanical removal of soil from an object or area.
- A patient in isolation is subject to sensory deprivation because of the restricted environment.
- An infection control professional monitors the incidence of infection within an institution and provides educational and consultative services to maintain infection prevention.
- Surgical asepsis necessitates more stringent techniques than does medical asepsis and is directed at eliminating all microorganisms.
- Surgical aseptic practices are followed if the skin is broken or if you perform an invasive procedure in a body cavity that is normally free of microorganisms.

❖ CRITICAL THINKING EXERCISES

1. Mrs. Jaycock had an in-dwelling urethral catheter for one week. The catheter has now been out for 24 hours. She complains of frequency of and pain on urination. Mrs. Jaycock suggests that the catheter be re-inserted so that she does not need to get up frequently. What can frequency of or

pain on urination indicate? Should the catheter be re-inserted? Why or why not? Describe at least one appropriate assessment measure and independent nursing action for Mrs. Jaycock.

2. You are caring for Mr. Huang, who has a large, open, draining abdominal wound. You notice another health care worker changing Mr. Huang's dressing without wearing gloves or using sterile supplies or sterile technique. When you question the health care worker regarding this practice, the person says, "Don't worry, the wound is already infected, and the antibiotics and draining will take care of any contaminants." How would you respond to this comment? What would your next steps be in following up on this incident?
3. Mrs. Niles is 83 years of age and lives alone. She has difficulty walking and relies on a church volunteer group to deliver lunches during the week. Her fixed income limits her ability to buy food. Last week, Mrs. Niles's 79-year-old sister died. The two sisters had been very close. Explain the factors that might increase Mrs. Niles's risk for infection.
4. Mr. Vargas is admitted to your facility with a history of recent weight loss, a cough that has persisted for two months, and hemoptysis. His chest X-ray film shows a cavity in one lung, and his physician suspects tuberculosis. What type of isolation precautions would you use for Mr. Vargas? What protection would you use when providing care? What education would you provide for the patient and his family?

❖ REVIEW QUESTIONS

1. If an infection can be transmitted from one person to another, it is a
 1. Communicable disease
 2. Portal of entry to a host
 3. Portal of exit from a reservoir
 4. Susceptible host
2. The mode of transmission for hepatitis A is
 1. Direct and indirect contact
 2. Droplet transmission
 3. Airborne transmission
 4. Vectorborne transmission
3. The interval when a patient manifests signs and symptoms specific to a type of infection is the
 1. Incubation period
 2. Convalescence stage
 3. Prodromal stage
 4. Illness stage
4. The most important and basic way to break the chain of infection is by
 1. Wearing gloves
 2. Practising hand hygiene
 3. Placing patients in isolation
 4. Providing private rooms for patients
5. The minimum handwashing time necessary to remove most transient microorganisms is
 1. 1.5 seconds
 2. 15 seconds
 3. 60 seconds
 4. 3 minutes

6. A patient is on isolation precautions for pulmonary tuberculosis. You note that the patient seems to be angry, but you know this is a normal response to isolation. Your best intervention is to
 1. Provide a dark, quiet room to calm the patient
 2. Explain the isolation procedures and provide meaningful stimulation
 3. Reduce the level of precautions to keep the patient from becoming angry
 4. Limit family and other caregiver visits to reduce the risk of spreading the infection
7. A gown should be worn when
 1. The patient's hygiene is poor
 2. The patient has AIDS or hepatitis
 3. You are assisting with medication administration
 4. Blood or body fluids may get on your clothing from a task you plan to perform
8. You have dressed a patient's wound and now plan to administer a medication (which is currently in the room) to the patient. It is important to
 1. Remove your gloves and perform hand hygiene before leaving the room
 2. Remove your gloves and perform hand hygiene before administering the medication
 3. Leave your gloves on to administer the medication
 4. Leave the medication on the bedside table to avoid having to remove your gloves before leaving the patient's room
9. A patient on your unit develops diarrhea, which is confirmed to be caused by *C. difficile*. What type of isolation should this patient be placed on?
 1. Airborne isolation
 2. Contact precautions
 3. Standard precautions or routine practices
 4. Droplet precautions
10. When performing surgical hand hygiene, your hands must be kept
 1. Above your elbows
 2. Below your elbows
 3. At a 45-degree angle
 4. In a comfortable position

✦ RECOMMENDED WEB SITES

Community and Hospital Infection Control Association of Canada: <http://www.chica.org/>

Community and Hospital Infection Control Association of Canada (CHICA-Canada) is a national, multidisciplinary, voluntary association of infection control professionals committed to improving infection prevention and control.

Public Health Agency of Canada: <http://www.phac-aspc.gc.ca>

This federal government site provides links to documents related to infection control practices, including the *Canada Communicable Disease Report*.

Review Question Answers

1. 1; 2. 1; 3. 4; 4. 2; 5. 2; 6. 2; 7. 4; 8. 2; 9. 2; 10. 1

Rationales for the Review Questions appear at the end of the book.

Medication Administration

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Based on the original chapter by Amy M. Hall, RN, BSN, MS, PhD, CNE

objectives

Mastery of content in this chapter will enable you to:

- Define the key terms listed.
- Examine the nurse's role and responsibilities regarding medication administration.
- Describe the physiological mechanisms of medication action, including absorption, distribution, metabolism, and excretion of medications.
- Differentiate among different types of medication actions.
- Discuss developmental factors that influence pharmacokinetics.
- Discuss factors that influence medication actions.
- Discuss methods of educating a patient about prescribed medications.
- Compare and contrast the roles of the physician, the pharmacist, and the nurse in medication administration.
- Implement nursing actions to prevent medication errors.
- Describe factors to consider when choosing routes of medication administration.
- Calculate a prescribed medication dose.
- Discuss factors to use when assessing a patient's needs for and response to medication therapy.
- Explain the 10 rights of medication administration.
- Prepare and administer subcutaneous, intramuscular, and intradermal injections; intravenous medications; hypodermoclysis infusions; oral and topical skin preparations; eye, ear, and nose drops; vaginal instillations; rectal suppositories; and inhalants.
- Describe the importance of safe medication techniques.
- Describe the importance of establishing and adhering to agency policies and procedures when administering medications.
- Identify and describe how principles of primary health care are applied to medication administration in nursing practice.

key terms

- Absorption, p. 666
- Adverse effects, p. 667
- Anaphylactic reactions, p. 667
- Biotransformation, p. 666
- Buccal, p. 669
- Concentration, p. 668
- Controlled substances, p. 665
- Culture of safety, p. 679
- Detoxify, p. 666
- Hypodermoclysis, p. 747
- Idiosyncratic reaction, p. 667
- Infusions, p. 668
- Inhalation, p. 671
- Injection, p. 670
- Instillation, p. 697
- Intra-articular, p. 671
- Intracardiac, p. 671
- Intradermal (ID), p. 670
- Intramuscular (IM), p. 670
- Intraocular, p. 671
- Intravenous (IV), p. 669
- Irrigations, p. 672
- Medication allergy, p. 667
- Medication error, p. 678
- Medication interaction, p. 668
- Medication reconciliation, p. 679
- Metered-dose inhalers (MDIs), p. 706
- Metric system, p. 671
- Narcotics, p. 665
- Ophthalmic, p. 698
- Parenteral administration, p. 670
- Peak concentration, p. 668
- Pharmacokinetics, p. 666
- Polypharmacy, p. 690
- Prescription, p. 675
- Serum half-life, p. 668
- Side effects, p. 667
- Solution, p. 672
- Subcutaneous, p. 670
- Sublingual, p. 669
- Synergistic effect, p. 668
- Therapeutic effect, p. 667
- Toxic effects, p. 667
- Transdermal disc, p. 671
- Verbal order, p. 675
- Z-track method, p. 733

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Patients who have acute or chronic diseases or conditions use a variety of strategies to restore or maintain their health. A medication is a substance used in the prevention, diagnosis, relief, treatment, or cure of health alterations. Medications are a primary treatment that patients associate with restoration of health. No matter where patients receive their health care—in hospitals, at clinics, or at home—nurses play an essential role in preparing and administering medications, teaching patients about medications, and evaluating patients' responses to medications. In the primary health care setting, patients often self-administer their medications. As a nurse, you are responsible for evaluating the effects of the medications on the patient's health status, teaching patients about their medications and their side effects, promoting patient adherence to the medication regimen, and evaluating the patient's technique for all routes of medication delivery. Additionally, you must assess the relationship between a patient's medication regime and socioenvironmental influences, including accessibility to resources (e.g., financial and geographical). Consistent with principles of primary health care, nurses can implement interventions to address barriers to effective medication management.

In both acute and restorative health care settings, nurses spend a great deal of time administering medications to patients and ensuring that patients are adequately prepared to self-administer medications when they are discharged. If patients cannot administer their own medications when they are at home, family members or support persons can take responsibility for this task. As a nurse, you assess the effect of the medications in restoring or maintaining health and continue to educate the patient, the patient's family, and home care personnel about the medication's purpose, regimen, and side effects.

Scientific Knowledge Base

Medications are administered to patients to prevent, diagnose, or treat disease and health conditions. Because medication administration and evaluation are essential to nursing practice, you need to understand the actions and effects of the medications your patients take. To safely and accurately administer medications, you must have an understanding of pharmacology, pharmacokinetics (the study of how medications enter, affect, and exit the body), human growth and development, human anatomy, pathophysiology, psychology, nutrition, and mathematics. You need to apply your cumulative nursing knowledge when administering medications. The nursing process provides the framework for you to organize your thoughts and actions, and it is the foundation for medication administration.

Pharmacological Concepts

Drug Names. A medication may have as many as three different names. A medication's chemical name provides an exact description of the medication's composition and molecular structure. Chemical names are rarely used in clinical practice. For example, the chemical name N-acetyl-para-aminophenol is commonly known as Tylenol. The generic, or nonproprietary, name is given by the manufacturer that first develops the medication. Acetaminophen is the generic name for Tylenol. The generic name becomes the official name under which the medication is listed in official publications, such as the *Compendium of Pharmaceuticals and Specialties (CPS)*, the

Canadian Formulary (CF), or the *United States Pharmacopeia (USP)*. In addition to the drug name, all drug products approved for distribution in Canada have an eight-digit number, which is assigned by the Health Protection Branch of the federal government. This Drug Identification Number (DIN) is used by various groups and agencies to track drug information across Canada.

The trade name, brand name, or proprietary name is the name under which a manufacturer markets a medication. The trade name is followed by the symbol TM, which indicates that the manufacturer has trademarked the medication's name (e.g., TemptraTM, MotrinTM). Manufacturers choose trade names that are easy to pronounce, spell, and remember so that laypersons will remember the medication names. A medication may be produced by many different companies, and similarities in their trade names can be confusing. Because similarities in drug names are a common cause of medical errors, the Joint Commission (2007) in the United States publishes on its Web site a list of drugs whose names look like or sound like other drug names as well as recommendations for nurses, prescribers, other health care providers, and health care organizations to prevent drug errors related to look-alike and sound-alike names of medications. Medications are available under a variety of different nomenclatures, or names, and you must be careful to obtain the exact name and spelling for the particular medications you administer.

Classification. Medication classification indicates the effect of the medication on a body system, the symptoms the medication relieves, or the medication's desired effect. For example, patients who have type 2 diabetes often take medications to control their blood glucose level. *Sulfonylureas* are one classification of medications often used by these patients. At least seven different medications are included in the sulfonylurea classification (McKenry et al., 2006). A prescriber chooses a particular medication on the basis of the patient's characteristics; the medication's cost, efficacy, and dosing frequency; and the prescriber's experience with the medication. Some medications belong to more than one class. For example, aspirin is an analgesic, an antipyretic, and an anti-inflammatory medication.

Medication Forms. Medications are available in a variety of forms, or preparations (Figure 33-1). The form of the medication determines its route of administration. The composition of a medication is designed to enhance its absorption



Figure 33-1 Forms of oral medications. Top row: Uniquely shaped tablet, capsule, scored tablet. Bottom row: Gelatin-coated liquid, extended-release capsule, enteric-coated tablet.

and metabolism. Many medications are made in several forms, such as tablets, capsules, elixirs, and suppositories. When administering a medication, you must be certain to use the proper form (Table 33-1).

Medication Legislation and Standards

Canadian Drug Legislation. Regulation of drug standards began in Canada in 1884, when the *Adulteration Act* set the conditions under which a drug could be adulterated. The *Food and Drugs Act* of 1920 replaced this Act and, with amendments in 1950, gave the federal government control of the manufacture and sale of all drugs (except narcotics), all food, all cosmetics, and certain medical devices.

The federal government first attempted to control narcotic substances in 1908 through the *Opium Act*. Cocaine and morphine came under the jurisdiction of this Act in 1911. In 1961, the *Narcotic Control Act*, which controls the manufacture, distribution, and sale of narcotic drugs, was enacted. This Act was repealed in 1996 and replaced by the *Controlled Drugs and Substances Act*. The federal government has also passed legislation that regulates the manufacture and sale of herbs and other natural health products. This legislation addresses the content of these products as well as the products' packaging, labelling, distribution, and storage.

Drug Standards. Official publications, such as the *British Pharmacopoeia (BP)* and the *Canadian Formulary*, set standards

► TABLE 33-1 Forms of Medication

Form	Description
Medication Forms Commonly Prepared for Administration by Oral Route	
Solid Forms	
Caplet	Shaped like a capsule and coated for ease of swallowing.
Capsule	Medication encased in a gelatin shell.
Tablet	Powdered medication compressed into a hard disc or cylinder; in addition to primary medication, contains binders (adhesives that allow the powder to stick together), disintegrators (to promote tablet dissolution), lubricants (for ease of manufacturing), and fillers (to make a convenient size for swallowing).
Enteric-coated tablet	Coated tablet that does not dissolve in stomach; coatings dissolve in intestine, where medication is absorbed.
Pill	Contains one or more medications; shaped into globules, ovoids, or oblongs; rarely used because most pills have been replaced by tablets.
Liquid Forms	
Elixir	Clear fluid containing medication and either water or alcohol, or both; often sweetened.
Extract	Syrup or dried form of pharmacologically active medication, usually made by evaporating the solution.
Aqueous solution	Medication dissolved in water.
Aqueous suspension	Finely divided drug particles dispersed in a liquid medium; when the suspension is left standing, particles settle to the bottom of the container.
Syrup	Medication dissolved in a concentrated sugar solution.
Tincture	Medicinal alcoholic extract from a plant or vegetable.
Other Oral Forms and Terms Associated With Oral Preparations	
Troche (lozenge)	Flat, round tablet that dissolves in the mouth to release medication; not intended for ingestion.
Aerosol	Aqueous medication sprayed and absorbed in the mouth and upper airway; not intended for ingestion.
Sustained release	Tablet or capsule that contains small particles of a medication coated with material that requires time to dissolve.
Medication Forms Commonly Prepared for Administration by Topical Route	
Ointment (salve or cream)	Semisolid, externally applied preparation, usually containing one or more medications.
Liniment	Preparation that usually contains medication and alcohol, oil, or soapy emollient; applied to the skin.
Lotion	Liquid suspension that usually protects, cools, or cleanses skin and can contain medication.
Paste	Thick ointment; absorbed through the skin more slowly than ointment; often used for skin protection.
Transdermal disc or patch	A disc or patch from which medication is absorbed through the skin slowly over a long period of time (e.g., 24 hours, 1 week).
Medication Forms Commonly Prepared for Administration by Parenteral Route	
Solution	Sterile preparation that contains water with one or more dissolved medicinal compounds.
Powder	Sterile particles of medication that are dissolved in a sterile liquid (e.g., water or normal saline) before administration.
Medication Forms Commonly Prepared for Instillation Into Body Cavities	
Solution	Medication dissolved in water or other liquid.
Intraocular disc	Small, flexible oval (similar to a contact lens) consisting of two soft, outer layers and a middle layer containing medication; slowly releases medication when moistened by ocular fluid.
Suppository	Solid medicine dosage mixed with gelatin and shaped into a pellet for insertion into a body cavity (rectum or vagina); melts at body temperature to release medication.

for drug strength, quality, purity, packaging, safety, labelling, and dosage form. Physicians, nurses, and pharmacists depend on these standards to ensure that patients receive pure drugs in safe and effective dosages.

Accepted standards must be met in the following areas:

- **Purity:** Manufacturers must meet purity standards for the type and concentration of substances allowed in drug products.
- **Potency:** The concentration of the active drug in the preparation affects its strength, or potency.
- **Bioavailability:** The ability of a drug to be released from its dosage form and to be dissolved, absorbed, and transported by the body to the drug's site of action.
- **Efficacy:** Detailed laboratory studies help determine a drug's effectiveness.
- **Safety:** All drugs need to be continually evaluated to determine their side effects.

Control. Administration of the *Food and Drugs Act* and the *Controlled Drugs and Substances Act* is carried out by the Health Protection Branch (HPB) of the federal government. Before a new drug can be marketed in Canada, an application for approval must be made to the HPB. After intensive testing to ensure the drug's effectiveness and safety in humans, the HPB reviews the application. The HPB issues a Drug Identification Number and Notification of Compliance, which allow the drug to be sold in Canada. Stringent controls are applied to this new drug until sufficient information has been accumulated to ensure its safety and efficacy. Only then is the drug released for general use. Monitoring of the drug is ongoing to report adverse effects, safety concerns, or changes in the indications for a particular drug's use.

Provincial, Territorial, and Local Regulation of Medication. The provincial and territorial governments do not directly regulate the manufacture or sale of drugs. However, because the provincial and territorial governments have most of the legislative responsibility for health care, provincial and territorial legislation indirectly affects the use and sale of drugs within provincial and territorial boundaries. In addition, each province and territory has legislation regarding medical, dental, pharmacy, and nursing practice that dictates each health care provider's role in the ordering, dispensing, and administration of drugs. In particular, some provincial and territorial pharmacy legislation includes schedules that indicate the drugs that can be sold without prescription, over the counter, and by prescription only. The National Association of Pharmacy Regulatory Authorities facilitates the activities of the regulatory authorities of all provinces and Yukon and promotes the harmonization of the practice of drug sales across the country.

Health care institutions establish policies that conform to federal and provincial regulations. The size of an institution, the types of services it provides, and the types of professional personnel it employs influence an institution's policies for drug control, distribution, and administration. Because an institution is primarily concerned with preventing health problems resulting from drug use, institutional policies are often more restrictive than government controls. For example, a common institutional policy is the automatic discontinuation of antibiotic therapy after a predetermined number of days. Although a prescriber may reorder an antibiotic, this policy helps to control unnecessarily prolonged drug therapy, which may lead to drug sensitivity or toxic reactions.

Medication Regulation and Nursing Practice. In Canada, you must be familiar with both the federal and

provincial or territorial regulations affecting drug administration in your practice areas. If you move from one province or territory to another, you may discover significant differences in the laws governing drug administration. For example, laws vary concerning the prescription and administration of drugs. In the past, only physicians could prescribe medications. Today, most provinces have amended their nursing practice acts to include the prescription of medications by nurses in advanced practice. In most cases, this privilege is limited to nurse practitioners, clinical nurse specialists, and nurse midwives.

Provincial nursing organizations have developed regulations that guide nursing practice with regard to medication administration; for example, the College of Nurses of Ontario *Practice Standard on Medication* (2008), the College and Association of Registered Nurses of Alberta *Medication Administration Guidelines for Registered Nurses* (2007), and the Saskatchewan Registered Nurses' Association *Medication Administration Guidelines for Registered Nurses* (2007). Such guidelines are intended to promote safe medication administration practices for nurses.

You are responsible for following legal provisions when administering **controlled substances** (drugs that affect the mind or behaviour), which can be dispensed only with a prescription. Violations of the *Narcotic Control Act* are punishable by fines, imprisonment, and loss of your nursing licence or your nursing registration. Hospitals and other health care institutions have policies for the proper storage and distribution of controlled substances, including narcotics (Box 33-1). **Narcotics** are natural opioid drugs or semi-synthetic or synthetic substitutes for these drugs.

► BOX 33-1

Guidelines for Safe Narcotic Administration and Control

- Store all narcotics in a locked, secure cabinet or container. (Cabinets with computer-controlled locking devices are preferred.)
- Count narcotics frequently. Count and record inventories on a continuous basis, especially when narcotic drawers are opened and when nursing shifts change.
- Report discrepancies in narcotic counts immediately.
- Use a special inventory record each time a narcotic is dispensed. Records are often kept electronically and provide an accurate ongoing count of narcotics used, narcotics remaining, and information about narcotics that are wasted.
- After dispensing a narcotic, use the record to document the patient's name, the date and time of medication administration, the name of the medication, the dose, and your signature.
- If you dispense only part of a premeasured dose of a controlled substance, a second nurse must witness disposal of the unused portion. If paper records are kept, both you and the nurse who witnesses the wastage are required to sign the form. Computerized systems record the nurses' names electronically. Do not place wasted portions in the sharps containers. Instead, flush wasted portions of tablets down a toilet and wash wasted liquids down a sink or return to the pharmacy, depending on your institution's policy for disposal of wasted controlled substances.

Pharmacokinetics as the Basis of Medication Actions

For medications to be therapeutic, they must be taken into a patient's body, where they are absorbed and distributed to cells, tissues, or a specific organ, and they must alter physiological functions. **Pharmacokinetics** is the study of how medications enter the body, reach their site of action, metabolize, and exit the body. Use your knowledge of pharmacokinetics when timing medication administration, selecting the route of administration, considering the patient's risk for alterations in medication action, and evaluating the patient's response.

Absorption. Absorption refers to the passage of medication molecules into the blood from the medication's site of administration. Medication absorption is affected by the route of administration, the ability of the medication to dissolve, blood flow to the site of administration, the patient's body surface area, and lipid solubility (maximum concentration of a chemical that will dissolve in fatty substances) of medication.

Route of Administration. Each route of medication administration has a different rate of absorption. When medications are applied to the skin, absorption is slow due to the physical makeup of the skin. Medications placed on the mucous membranes and respiratory airways are quickly absorbed because these tissues are highly vascular. Because orally administered medications must pass through the gastrointestinal (GI) tract to be absorbed, the overall rate of absorption is usually slow. Intravenous (IV) injection produces the most rapid absorption because this route provides immediate access to systemic circulation.

Ability of the Medication to Dissolve. The ability of an oral medication to dissolve depends on its form or preparation. Solutions and suspensions in a liquid state are absorbed more readily than tablets or capsules. Acidic medications pass through the gastric mucosa rapidly. Medications that have a base pH are not absorbed before reaching the small intestine.

Blood Flow to the Site of Administration. When the site of administration contains a rich blood supply, the body absorbs medications more rapidly. As blood comes in contact with the site of administration, the medication is absorbed. Therefore, areas that have more blood supply will experience enhanced absorption, facilitating the passage of the medication into the bloodstream.

Body Surface Area. When a medication is in contact with a large surface area, the medication will be absorbed at a faster rate. This characteristic explains why most medications are absorbed in the small intestine, not in the stomach.

Lipid Solubility of a Medication. Because the cell membrane has a lipid layer, highly lipid-soluble medications easily cross the cell membrane and are absorbed quickly. The absorption of medication is also affected by the presence of food in the stomach. Some oral medications are absorbed more easily when administered between meals or on an empty stomach because food can change the structure of a medication and impair its absorption. When you administer medications, you should be aware of potential medication-medication interactions listed in the *CPS*, in drug manuals, and on drug packaging. If medications that interact are ordered at the same time, notify the prescriber immediately to revise medication administration times.

Safe medication administration requires knowledge of factors that may alter or impair the absorption of the prescribed medications. This information is based on an

understanding of the medication's pharmacokinetics, the patient's history, the physical examination of the patient, and knowledge gained through daily interactions with patients. Use this knowledge to ensure that you administer all prescribed medications at the correct time. Consult and collaborate with the patient's prescribers to ensure the patient achieves the therapeutic effect of all medications. Before administering any medication, check pharmacology books or drug references and package inserts, or consult with pharmacists to identify medication-medication interactions or medication-nutrient interactions. Furthermore, because the safe delivery of many medications (e.g., blood pressure-lowering agents, blood glucose-lowering medications, and anti-arrhythmics) is dependent on nursing assessments, ensure that physical assessment data are collected and interpreted before administering medications.

Distribution. After a medication is absorbed by the body, it is distributed to tissues and organs and to its specific site of action. The rate and extent of distribution depend on the physical and chemical properties of the medications and the physiology of the person taking the medication.

Circulation. After a medication enters the bloodstream, it is carried throughout the body's tissues and organs. The speed at which it reaches the site depends on the vascular content of the tissues and organs. Conditions that limit blood flow or blood perfusion inhibit the distribution of a medication. For example, patients who have experienced heart failure have impaired circulation, which also impairs medication delivery to the intended site of action. Therefore, the efficacy of medications in heart failure patients can be delayed or altered.

Membrane Permeability. For a medication to be distributed to an organ, it must pass through all the organ's tissues and biological membranes. Some membranes serve as barriers to the passage of medications. For example, the blood-brain barrier allows only fat-soluble medications to pass into the brain and cerebral spinal fluid. Therefore, central nervous system infections require treatment with antibiotics that selectively cross the blood-brain barrier. This change in the permeability of the blood-brain barrier can lead to confusion and other adverse effects in some older patients. The placental membrane also has a nonselective barrier to medications. Fat-soluble and non-fat-soluble agents can cross the placenta and result in fetal deformities, respiratory depression, and, when combined with narcotic use, withdrawal symptoms.

Protein Binding. Most medications bind to proteins to some extent. The degree to which medications bind to serum proteins, such as albumin, affects the medication's distribution. Medications bound to albumin cannot exert pharmacological activity. The unbound, or free, medication is the active form of the medication. Older adults have a decrease in albumin in their bloodstream, which is probably the result of a change in their liver function. The same is true for patients who have liver disease or malnutrition, who, along with older adults, have the potential for more medication being unbound, and thus may be at risk for an increase in medication activity or toxicity, or both.

Metabolism. After a medication reaches its site of action, it metabolizes into a less active or inactive form that is more easily excreted. **Biotransformation** occurs when enzymes **detoxify**, degrade (break down), and remove the biologically active chemicals. Most biotransformation occurs within the liver, although the lungs, kidneys, blood, and intestines also metabolize medications. The liver is especially important

because its specialized structure oxidizes and transforms many toxic substances. The liver degrades many harmful chemicals before they are distributed to the tissues. If a decrease in liver function occurs, a medication is usually eliminated more slowly and results in an accumulation of the medication. If the organs that metabolize medications are altered, patients are at risk for medication toxicity. For example, a small sedative dose of a barbiturate may cause a patient with liver disease to lapse into a hepatic coma.

Excretion. After medications are metabolized, they exit the body through the kidneys, liver, bowel, lungs, or exocrine glands. The chemical makeup of a medication determines the organ of excretion. Gaseous and volatile compounds, such as nitrous oxide and alcohol, exit through the lungs. Deep breathing and coughing (see Chapter 48) help the postoperative patient to eliminate anaesthetic gases more rapidly. The exocrine glands excrete lipid-soluble medications. When medications exit through the sweat glands, the skin often becomes irritated. You can assist the patient in good hygiene practices (see Chapter 37) to promote cleanliness and skin integrity. If a medication is excreted through the mammary glands, a nursing infant is at risk of ingesting the chemicals. You will need to check on the safety of any medication used by breastfeeding women.

The GI tract is another route for medication excretion. Many medications enter the hepatic circulation where they are broken down by the liver and excreted into the bile. After chemicals enter the intestines through the biliary tract, they may be reabsorbed by the intestines. Factors that increase peristalsis (e.g., laxatives and enemas) accelerate medication excretion through the feces, whereas factors that slow peristalsis (e.g., inactivity and improper diet) may prolong a medication's effects.

The kidneys are the main organs for medication excretion. Some medications escape extensive metabolism and exit unchanged in the urine. Other medications must undergo biotransformation in the liver before being excreted by the kidneys. If renal function declines, a patient is at risk for medication toxicity. If the kidneys cannot adequately excrete a medication, the dose may need to be reduced. Maintenance of an adequate fluid intake (50 mL/kg/day) promotes proper elimination of medications for the average adult.

Types of Medication Action

Medications vary considerably in the way they act and in their types of action. Factors other than characteristics of the medication also influence medication actions. A patient does not always respond in the same way to each successive dose of a medication. Sometimes, the same medication causes very different responses in different patients. Therefore, you need to understand all the effects that medications can have on patients.

Therapeutic Effects. The therapeutic effect is the expected or predictable physiological response that a medication causes. Each medication has a desired therapeutic effect, which is the reason it is prescribed. For example, nitroglycerine reduces the body's cardiac workload and increases myocardial oxygen supply. A single medication may have more than one therapeutic effect. For example, aspirin reduces platelet aggregation (clumping) and is an analgesic, an antipyretic, and an anti-inflammatory drug. Knowing the desired therapeutic effect for each medication allows you to provide patient education to accurately evaluate the medication's desired effect.

Side Effects. Side effects are the unintended, secondary effects that a medication predictably will cause. Side effects may be harmless or injurious. If the side effects are serious enough to negate a medication's intended beneficial effects, the prescriber may decide to discontinue the medication. Patients often stop taking medications because of side effects.

Adverse Effects. Adverse effects are severe, negative responses to medication. For example, a patient may become comatose after ingesting a drug. When adverse responses to medications occur, the prescriber immediately discontinues the medication. Some adverse effects are unexpected effects that were not discovered during drug testing. When this situation occurs, health care providers should report the adverse effect to the Health Protection Branch of the federal government (<http://www.hc-sc.gc.ca/dhp-mps/medeff/report-declaration/index-eng.php#a2>). This reporting system is voluntary.

Toxic Effects. Toxic effects develop after prolonged intake of a medication or after a medication accumulates in the blood because of impaired metabolism or impaired excretion. Excess amounts of a medication within the body may have lethal effects, depending on the medication's action. For example, toxic levels of morphine, which is an opioid, may cause severe respiratory depression and death. Antidotes are available to treat specific types of medication toxicity. For example, Narcan is used to reverse the effects of opioid toxicity.

Idiosyncratic Reactions. Medications sometimes cause unpredictable effects, such as an **idiosyncratic reaction**, which occurs when a patient overreacts or underreacts to a medication or has a reaction different from the normal reaction. For example, a child receiving an antihistamine (Benadryl) may become extremely agitated or excited instead of becoming drowsy. It is not always possible to predict whether a patient will have an idiosyncratic response to a medication.

Allergic Reactions. Allergic reactions are unpredictable responses to a medication. Some patients become immunologically sensitized to the initial dose of a medication. After repeated administration of the medication, the patient develops an allergic response to the medication, its chemical preservatives, or a metabolite. The medication or chemical acts as an antigen, triggering the release of the body's antibodies. A patient's **medication allergy** symptoms may vary, depending on the individual and the medication (Table 33-2). Among the different classes of medications, antibiotics cause a high incidence of allergic reactions.

Anaphylactic reactions are severe reactions that are life-threatening and are characterized by sudden constriction of

► TABLE 33-2 Mild Allergic Reactions

Symptom	Description
Urticaria	Raised, irregularly shaped skin eruptions with varying sizes and shapes; eruptions have reddened margins and pale centre.
Rash	Small, raised vesicles that are usually reddened; often distributed over entire body.
Pruritus	Itching of skin; accompanies most rashes.
Rhinitis	Inflammation of mucous membranes lining nose; causes swelling and clear, watery discharge.



Figure 33-2 A MedicAlert bracelet is engraved with a person's emergency medical information, including drug allergies.

bronchial muscles, edema of the pharynx and larynx, severe wheezing, shortness of breath, and circulatory collapse. Immediate use of antihistamines, epinephrine, or bronchodilators is required to treat anaphylactic reactions. Emergency resuscitation measures are sometimes required. A patient with a known history of an allergy to a medication needs to avoid exposure to that medication and must wear a bracelet or medal engraved with emergency medical information, including medication allergies (e.g., a MedicAlert bracelet, Figure 33-2). These bracelets and medals alert health care workers to the patient's medical information, including allergies, if the patient is unable to communicate this information when receiving medical care. Additionally, some patients with allergies leading to anaphylactic reactions carry their own epinephrine pens.

Medication Interactions

When one medication modifies the action of another medication, a **medication interaction** occurs. Medication interactions are common in patients who take several medications. Some medications increase or diminish the action of other medications or may alter the way another medication is absorbed, metabolized, or eliminated from the body. When two medications have a **synergistic effect**, the combined effect of the two medications is greater than the effect of the medications when given separately. For example, alcohol acts as a depressant on the central nervous system and has a synergistic effect on antihistamines, antidepressants, barbiturates, and narcotic analgesics.

Sometimes a medication interaction is desired. Prescribers combine medications to create an interaction that will have a beneficial effect on the patient's condition. For example, a patient with high blood pressure may be prescribed several medications, such as diuretics and vasodilators, which act together to control blood pressure when one medication alone is not effective.

Medication Dose Responses

After administration, a medication undergoes absorption, distribution, metabolism, and excretion. Except when administered intravenously, medications take time to enter the bloodstream. The quantity and distribution of a medication in different body compartments change constantly. When a medication is prescribed, the goal is to achieve a constant blood level of the medication within a safe therapeutic range. Repeated doses are required to achieve a constant therapeutic **concentration** of a medication because a portion of a drug is always being excreted. The highest serum concentration (**peak concentration**) of a medication usually occurs just before the body absorbs the last of the medication (McKenry et al., 2006). After peaking, the serum medication concentration falls

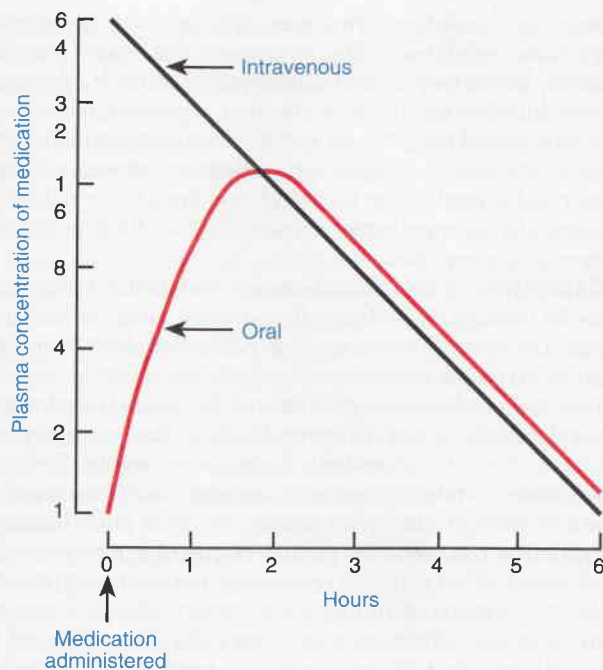


Figure 33-3 Curve showing therapeutic blood levels of medication.
Source: From Clark, J. F., Queener, S. F., & Karb, V. B. (1998). *Pharmacological basis of nursing practice* (6th ed.). St Louis, MO: Mosby.

progressively. After intravenous (IV) infusions, the peak concentration occurs quickly, but the serum level also begins to fall immediately (Figure 33-3). The point at which the lowest amount of drug is detected in the serum is called the **trough concentration**. Some medications doses (e.g., vancomycin) are based on peak and trough serum levels. The trough level is generally drawn 30 minutes before the drug is administered, and the peak level is drawn whenever the drug is expected to reach its peak concentration. The time a drug takes to reach its peak concentration varies depending on the medication's pharmacokinetics.

All medications have a **serum half-life**, which is the time it takes for the excretion processes to lower the serum medication concentration by half. To maintain a therapeutic plateau, the patient needs to receive regular fixed doses. For example, current evidence indicates that pain medications are most effective when they are given "around the clock" to maintain an almost constant level of pain medication rather than being given when the patient intermittently complains of pain. After an initial medication dose, the patient receives each successive dose when the previous dose reaches its half-life.

Together with the patient, you need to follow regular dosage schedules and adhere to prescribed doses and dosage intervals (Table 33-3). Some agencies set schedules for medication administration. However, nurses are able to alter this schedule on the basis of knowledge about a medication. For example, at some agencies, medications prescribed to be taken once a day are given at 9:00 a.m. However, if a medication works best when given before bedtime, administer the medication before the patient goes to sleep.

When teaching patients about dosage schedules, use language that is familiar to the patient. For example, when teaching a patient about medication dosing twice a day, instruct the patient to take a medication in the morning and again in the

TABLE 33-3

Common Dosage Administration Schedules

Dosage Schedule

Before meals
As desired
Twice a day
Hour
At bedtime
After meals
Whenever there is a need
Every morning, every A.M.
Every day, daily
Every hour
Every 2 hours
Every 4 hours
Every 6 hours
Every 8 hours
Four times a day
Every other day
Give immediately
Three times a day

Abbreviation or Notation*

AC, ac
ad lib
BID
h, hr
hs
PC, pc
prn
qam
OD
qh
q2h
q4h
q6h
q8h
QID
QOD
STAT
TID

*For some terms, it is safer to write out the term than to abbreviate it (see Table 33-7). Follow your agency's policy regarding the use of abbreviations.

TABLE 33-4

Terms Associated With Medication Actions

Term	Meaning
Onset	The time it takes for a medication to produce a response after it has been administered.
Peak	The time it takes for a medication to reach its highest effective concentration.
Trough	Minimum blood serum concentration of medication, typically reached just before the next scheduled dose.
Duration	The time during which a medication is present in sufficient concentration to produce a response.
Plateau	Blood serum concentration of a medication has been reached and is maintained after repeated fixed doses.

evening. Use knowledge about the time intervals of medications to anticipate a medication's effect and to educate the patient about when to expect a response. Table 33-4 lists common terms associated with medication actions.

Routes of Administration

The route prescribed for administering a medication depends on the medication's properties, the medication's desired effect, and the patient's physical and mental condition (Table 33-5). Collaborate with the prescriber to determine the best route for a patient's medication, as in the following hypothetical situation:

Mr. Huels's temperature is 39.2° C. He complains of nausea and is unable to tolerate oral fluids. You check Mr. Huels's orders, which read, "Acetaminophen 650 mg orally for temperature above 38.5° C." Based on your assessment of Mr. Huels's nausea, you determine that



Figure 33-4 Sublingual administration of a tablet.

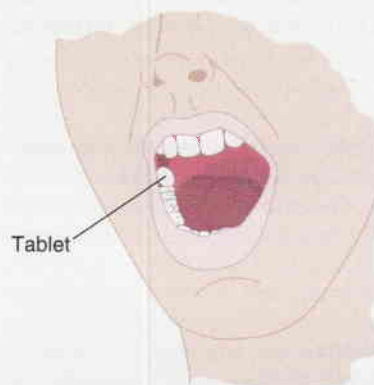


Figure 33-5 Buccal administration of a tablet.

he will not be able to tolerate acetaminophen orally. You consult the prescriber and receive an order for acetaminophen per rectum. By using a rectal suppository, you are able to administer the acetaminophen without increasing the patient's symptoms of nausea.

Oral Routes. The oral route is the easiest and the most commonly used route of administering medication. Medications are given by mouth and swallowed with fluid. Oral medications have a slower onset of action and a more prolonged effect than parenteral medications. In general, patients prefer taking medication orally.

Sublingual Administration. Some medications are designed to be readily absorbed after being placed under the tongue to dissolve (Figure 33-4). A medication given by the **sublingual** route should not be swallowed because the medication will not have the desired effect. Nitroglycerine is commonly given sublingually. After giving a sublingual medication, avoid giving liquids; instruct the patient not to drink anything until the medication is completely dissolved.

Buccal Administration. Administration of a medication by the **buccal** route involves placing solid medication in the mouth and against the mucous membranes of the cheek until the medication dissolves (Figure 33-5). To avoid mucosal irritation, teach patients to alternate cheeks with each subsequent dose. Advise patients not to chew or swallow the medication or to take any liquids with it. A buccal medication acts locally on the mucosa or systemically when it is dissolved in a person's saliva.

► **TABLE 33-5** Factors Indicating Choice of Administration Routes**Advantages****Oral, Buccal, and Sublingual Routes**

Convenient and comfortable for patient

Economical

Easy to administer

Medications may produce local or systemic effects.

Rarely cause anxiety for patient

Disadvantages or Contraindications

Avoid when patient has alterations in gastrointestinal function (e.g., nausea, vomiting), reduced motility (after general anaesthesia or bowel inflammation), or surgical resection of a portion of the gastrointestinal tract. Gastric secretions destroy some medications. Oral administration is contraindicated in patients who are unable to swallow (e.g., patients with neuromuscular disorders, esophageal strictures, mouth lesions). Oral medications may irritate the lining of the gastrointestinal tract, discolour teeth, or leave an unpleasant taste. An unconscious or confused patient may be unable or unwilling to swallow or hold medication under the tongue. Oral medications cannot be given when the patient has gastric suction. Oral medications are contraindicated in patients before some medical tests and surgeries.

Subcutaneous, Intramuscular (IM), Intravenous (IV), and Intradermal (ID) Routes

An alternative means of administration when oral medications are contraindicated

More rapid absorption than with topical or oral routes
IV infusion provides medication delivery when patient is critically ill or when long-term therapy is required.
If peripheral perfusion is poor, IV route is preferred over injections.

Risk of introducing infection. Some medications are expensive. Some patients experience pain from repeated needle sticks. Subcutaneous, IM, and ID routes are avoided in patients who have bleeding tendencies. Risk of tissue damage with subcutaneous injections. IM and IV routes have higher absorption rates, which places the patient at higher risk for reactions. Anxiety is caused in many patients, especially children.

Dermal Route**Topical Medications**

Primarily provide local effects
Painless
Limited side effects

Transdermal Medications

Prolonged systemic effects with limited side effects

Mucous Membranes*

Therapeutic effects are provided by local application to the affected sites.

Aqueous solutions are readily absorbed and capable of causing systemic effects.

An alternative means of administration when oral medications are contraindicated

Patients with skin abrasions are at risk for rapid medication absorption and systemic effects.
Medications slowly absorb through the skin.

Leaves oily or pasty substance on skin and may soil clothing.

Mucous membranes are highly sensitive to some medication concentrations.

Insertion of rectal and vaginal medication often causes embarrassment.

Patients with ruptured eardrums cannot receive irrigations. Rectal suppositories are contraindicated if patient has had rectal surgery or if active rectal bleeding is present.

Inhalation Routes

Provides rapid relief for local respiratory problems
Used for introduction of general anaesthetic gases

Some local inhalants can cause serious health effects.

*Includes mouth (buccal, sublingual), eyes, ears, nose, vagina, rectum, and ostomy.

Parenteral Routes. Parenteral administration involves injecting a medication into body tissues. The following are the four major sites of **injection** (which is the insertion of liquid into the body with a syringe):

Intradermal (ID): Injection into the dermis just under the epidermis

Subcutaneous: Injection into tissues just below the dermis

Intramuscular (IM): Injection into a muscle

Intravenous (IV): Injection into a vein

Some medications are administered into body cavities other than the four sites listed above. These routes of medication administration include epidural, intrathecal, intraosseous,

intraperitoneal, intrapleural, and intra-arterial routes. Depending on agency policy, additional education or certification may be required for you to administer medications through some routes. Whether you actually administer the medication by these routes, you remain responsible for monitoring the integrity of medication delivery systems, understanding the therapeutic value of the medication, and evaluating the patient's response to the therapy.

Epidural Route. Epidural medications are administered in the epidural space via a catheter, which is put in place by an anaesthesiologist. This route is often used for the administration of analgesia both intraoperatively and postoperatively

(see Chapter 41). If you have received extra education in the epidural route, you will be able to administer medications in bolus form or by continuous infusion. Be aware of agency policies regarding a patient's physical assessment following epidural medication administration.

Intrathecal Route. Intrathecal medications are administered through a catheter that has been placed into the subarachnoid space or into one of the ventricles of the brain. Intrathecal administration is often associated with long-term medication administration through surgically implanted catheters.

Intraosseous Route. This method of medication administration involves the infusion of medication directly into the bone marrow. Intraosseous routes are most commonly used in infants and toddlers because their intravascular space is difficult to access. This method is most often used when an emergency arises and IV access is impossible. The physician inserts an intraosseous infusion needle into the bone, usually the tibia, for the administration of medication by the nurse.

Intraperitoneal Route. Medications are administered into the peritoneal cavity, where they are absorbed into the circulation system. Intraperitoneal routes are used to administer chemotherapeutic agents, insulin, and antibiotics.

Intrapleural Route. An injection or a chest tube is used to administer intrapleural medications directly into the pleural space. Chemotherapeutic agents are the most common medications administered by this method.

Intra-arterial Route. Intra-arterial medications are administered directly into the arteries and are commonly used to deliver tissue plasminogen activators in patients who have arterial clots. Often, intra-arterial medications are delivered through in-dwelling catheters. You are responsible for monitoring the integrity of infusions systems and evaluating patients for adverse responses to these medications, including systemic and gastrointestinal bleeding. Ensure that you are familiar with agency protocols, policies, and procedures for patient assessment.

Other methods of medication administration that are usually limited to administration by a physician are **intracardiac** routes, in which medication is injected directly into cardiac tissue, and **intra-articular** routes, in which medication is injected into a joint.

Topical Administration. Medications applied to the skin and to mucous membranes usually result in local effects. Administer topical medications by painting or spreading the medication over the skin, applying moist dressings, soaking body parts in a solution, or giving medicated baths. Systemic effects often occur if a patient's skin is thin or broken down, if the medication concentration is high, or if the medication's contact with the skin is prolonged.

A **transdermal disc** or patch (i.e., an adhesive-backed patch that releases nitroglycerine, scopolamine, or estrogens) has systemic effects. The disc secures the medicated ointment to the skin. These topical applications may be applied for as few as 12 hours or as long as 7 days.

Medications can be applied to mucous membranes in a variety of ways: (1) by directly applying a liquid or ointment (e.g., using eye drops, gargling, swabbing the throat); (2) by inserting a medication into a body cavity (e.g., placing a suppository in the rectum or vagina or inserting medicated packing into the vagina); (3) by instilling fluid into a body cavity (e.g., use of ear drops, nose drops, or bladder and rectal instillation, and fluid is retained); (4) by irrigating a body

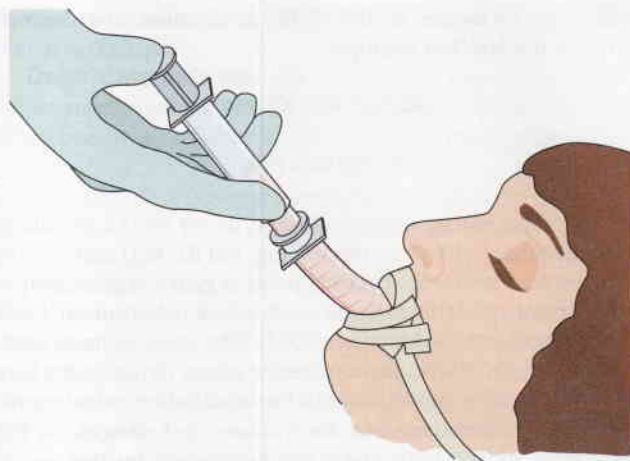


Figure 33-6 Medication being instilled through an endotracheal tube.

cavity (e.g., flushing with medicated fluid the eye, ear, vagina, bladder, or rectum, and fluid is not retained); and (5) by spraying (e.g., instillation into the nose or throat).

Inhalation Route. The deeper passages of the respiratory tract provide a large surface area for medication absorption. Medications can be administered through the nasal passages, the oral passage, or endotracheal or tracheostomy tubes. Endotracheal tubes are inserted into the patient's mouth and extend to the trachea (Figure 33-6), whereas tracheostomy tubes directly enter the trachea through an incision in the patient's neck. Medications that are administered by the **inhalation** route are readily absorbed and work rapidly because of the rich vascular alveolar-capillary network present in the pulmonary tissue. Inhaled medications may have either local or systemic effects.

Intraocular Route. In **intraocular** medication delivery, a medication in a form similar to a contact lens is inserted directly into the patient's eye. The eye medication disc has two soft outer layers that enclose the medication. The disc can remain in the patient's eye for up to one week. Pilocarpine, a medication used to treat glaucoma, is the most common medication delivered through the intraocular route.

Systems of Medication Measurement

The proper administration of a medication depends on your ability to compute medication doses accurately and to measure medications correctly. Mistakes can lead to a fatal error. You are responsible for checking the accuracy of the dose before you give a medication. The metric, apothecary, and household systems of measurement are used in medication therapy. Most nations, including Canada, use the metric system as their standard of measurement. Household measurements are used by health care providers when they write prescriptions to be self-administered by patients.

Metric System. Because it is a decimal system, the **metric system** (Système Internationale d'Unités [SI]) is the most logically organized system of measurement. Metric units can easily be converted and computed through simple arithmetic, such as multiplication and division. Each basic unit of measurement is organized into units of 10. Secondary units are formed by multiplying or dividing by 10. In multiplication, the

decimal point moves to the right; in division, the decimal moves to the left. For example:

$$10 \text{ mg} \times 10 = 100 \text{ mg}$$

$$10 \text{ mg} / 10 = 1 \text{ mg}$$

When designating a metric dosage, *do not write a zero alone after a decimal point* (e.g., write 5 mg, not 5.0 mg) and always include a zero before the decimal point (e.g., 0.1 mg) to comply with current guidelines (Institute for Safe Medication Practices, 2006a; Joint Commission, 2007). The basic units of measurement in the metric system are the metre (length), the litre (volume), and the gram (weight). For medication calculations, use only the measurements for volume and weight. In the metric system, the basic units are designated by the use of lowercase or uppercase letters:

Gram = g or Gm

Litre = L or l

Lower-case letters are used for abbreviations for other units:

Milligram = mg

Millilitre = mL

A system of Latin prefixes designates a subdivision of the basic units: *deci-* (1/10 or 0.1), *centi-* (1/100 or 0.01), and *milli-* (1/1000 or 0.001). Greek prefixes designate multiples of the basic units: *deka-* (10), *hecto-* (100), and *kilo-* (1000). When medication doses are written in metric units, prescribers and nurses use either divisions or multiples of a unit. Convert any fractions to the decimal form.

500 mg or 0.5 g, *not* 1/2 g

10 mL or 0.01L, *not* 1/100 L

Solutions. Solutions of various concentrations are used for injections, irrigations, and infusions. A **solution** is a given mass of solid substance dissolved in a known volume of fluid or a given volume of liquid dissolved in a known volume of another fluid. When a solid is dissolved in a fluid, the concentration is expressed in units of mass per units of volume (e.g., g/mL, g/L, mg/mL). A concentration of a solution may also be expressed as a percentage. A 10% solution, for example, is 10 g of solid dissolved in 100 mL of solution. A proportion also expresses concentrations. A 1/1000 solution represents a solution containing 1 g of solid in 1000 mL of liquid or 1 mL of liquid mixed with 1000 mL of another liquid.

Household Measurements. Household measures include drops, teaspoons, tablespoons, cups, pints, and quarts (or litres) for volume, and ounces and pounds (or grams and kilograms) for weight. Although ounces and pounds are considered household measures, they are also used in the apothecary system. The advantage of household measurements is their convenience and familiarity. When the accuracy of a medication dose is not critical, household measures can be safely used. For example, many over-the-counter medications can safely be measured by this method. To calculate medications accurately, you need to be familiar with the common

► TABLE 33-6 Equivalents of Measurement

Metric Measurement	Household Measurement
1 mL	15 drops (gtt)
4–5 mL	1 teaspoon (tsp)
15 mL	1 tablespoon (tbsp)
30 mL	2 tablespoons (tbsp)
250 mL	1 cup (c)
480 mL (approximately 500 mL)	1 pint (pt)
960 mL (approximately 1 L)	1 quart (qt)
3840 mL (approximately 5 L)	1 gallon (gal)

equivalents of metric and household units (Table 33-6). The disadvantage of household measures is their inaccuracy. Household utensils, such as teaspoons and cups, often vary in size. The scales used to measure pints or quarts are often not well calibrated.

Nursing Knowledge Base

The Institute of Medicine (IOM) (2003) published the book *To Err Is Human: Building a Safer Health System*. According to this book, in any given year, an estimated 98,000 people die from medical errors that occur in hospitals; more people die from medical errors than from motor vehicle accidents, breast cancer, and workplace injuries; and medication-related errors for hospitalized patients cost approximately \$2 billion annually.

Nurses play an important role in patient safety, especially in the area of medication administration. To safely administer medications, ensure that you know how to calculate medication doses accurately, strictly adhere to agency policy and procedure, and report any medication errors that occur. Be aware of the different roles that members of the health care team play in prescribing and administering medications. Remember to apply your previous learning to medication administration. The nursing process provides the framework for organizing your thoughts and actions, and it is the foundation for medication administration (Box 33-2).

Clinical Calculations

To administer medications safely, you need an understanding of basic arithmetic to calculate medication doses, mix solutions, and perform a variety of other activities. This skill is important because medications are not always dispensed in the unit of measure in which they are ordered (Box 33-3). This discrepancy occurs because medication companies package and bottle certain standard dosages. For example, the prescriber may order 20 mg of a medication that is available only in 40 mg vials. You frequently need to convert available units of volume and weight to the prescribed doses. Therefore, be aware of approximate equivalents in all major measurement systems.

Conversions Within One System. To convert units of measurement in the metric system, divide or multiply. To change milligrams to grams, divide by 1000, moving the decimal three places to the left.

$$1000 \text{ mg} = 1 \text{ g}$$

$$350 \text{ mg} = 0.35 \text{ g}$$

* BOX 33-2

EVIDENCE-INFORMED
PRACTICE GUIDELINEReducing Distractions During
Medication Administration

Evidence Summary

Many medication errors occur when nurses become distracted or lose focus during medication administration. Errors also occur when nurses fail to follow standard nursing protocols and procedures related to medication administration. Nurses experience multiple interruptions and distractions in today's health care environment. Systems need to be put in place to help nurses avoid these distractions and subsequent medication errors. Pape et al. (2005) used techniques to help nurses focus more acutely on medication administration. Nurses used small checklist cards that listed the steps of medication administration. The cards were similar to checklists used by pilots during the takeoff and landing of airplanes. Reported medication errors decreased after three weeks. Consequently, researchers posted "Do Not Disturb" signs in medication preparation areas to help remind everyone in the hospital not to disturb nurses during the medication administration process. Following the interventions, nurses were better able to follow the hospital's medication administration procedure, and they perceived fewer distractions during medication administration.

Application to Nursing Practice

- Consistently following nursing protocols for medication administration decreases medication errors.
- Nurses who experience fewer distractions during medication administration experience fewer medication errors.
- Placing "Do Not Disturb" signs in medication preparation areas helps reduce distractions and errors.
- Nurses need to investigate strategies that will decrease distractions, enhance their ability to follow nursing protocols, and improve their focus during medication administration.

Reference: Pape, T. M., Guerra, D. M., Muzquiz, M., Bryant, J. B., Ingram, M., Schraner, B., et al. (2005). Innovative approaches to reducing nurses' distractions during medication administration. *Journal of Continuing Nursing Education*, 36, 108–116.



to a quart measurement, divide 8 by 32 to get the equivalent, which is 0.25 quart.

Dose Calculations. Many formulas can be used to calculate medication doses. Apply the following basic formula when preparing solid or liquid doses of a medication:

$$\frac{\text{Dose ordered}}{\text{Dose on hand}} \times \text{Amount on hand} = \text{Amount to administer}$$

The dose ordered is the amount of medication prescribed. The dose on hand is the dose of medication supplied by the pharmacy (e.g., milligrams, units) and is expressed on the medication label as the contents of a tablet or capsule or as the amount of medication dissolved per unit volume of liquid. The amount on hand is the basic unit or quantity of the medication that contains the dose on hand. For solid medications, the amount on hand may be one capsule; the amount of liquid on hand may be a millilitre or litre, depending on the container. For example, a liquid medication comes in the strength of 125 mg per 5 mL. Thus, 125 mg is the dose on hand, whereas 5 mL is the amount on hand. The amount to administer is the actual amount of medication you will administer. Always express the amount to administer in the same unit as the amount on hand.

The following example illustrates how to apply the formula. The prescriber orders the patient to receive morphine 2 mg IV. Thus, the dose ordered is 2 mg. The medication is available in a vial containing 10 mg per millilitre, and the amount on hand is 1 mL. The formula is applied as follows:

$$2 \text{ mg} / 10 \text{ mg} \times 1 \text{ mL} = \text{Amount in millilitres to administer}$$

To simplify the 2/10 fraction to decimal form, divide numerator and denominator by 2:

$$1/5 \times 1 \text{ mL} = 1/5 \text{ mL or } 0.2 \text{ mL to administer}$$

Syringes are calibrated only in decimals. After converting the fraction 1/5 to 0.2 mL, prepare the correct dose.

The following is an example of how the formula applies when calculating solid dose forms. The prescriber orders 0.125 mg orally (PO) of digoxin. The medication is available in tablets containing 0.25 mg of digoxin.

$$\frac{0.125 \text{ mg}}{0.250 \text{ mg}} \times 1 \text{ tablet} = \text{Number of tablets to administer}$$

The fraction 0.125/0.250 equals 1/2 or 0.5. Therefore,

$$0.5 \times 1 \text{ tablet} = 0.5 \text{ or } 1/2 \text{ tablet to be administered}$$

Many tablets are manufactured with scores, or indentations, across the centre of the tablet (Figure 33-7). A scored tablet is easy to break in half for divided doses. Do not cut unscored tablets because the potential for an incorrect dose is high.

Often, liquid medications are manufactured in volumes greater than 1 mL. In applying the formula, be careful to use the correct concentration to avoid a medication error. For example, a medication order is for "erythromycin suspension 250 mg PO." The pharmacy delivers 100 mL bottles with the label stating, "5 mL contains 125 mg of erythromycin." Thus, to obtain the correct dose of medication, the appropriate concentration is 125 mg in 5 mL.

► BOX 33-3

Common Reasons for
Measurement Conversions

- Needing to convert fluid ounces to millilitres for measurement of intake and output
- Needing to convert body weight from pounds to kilograms and vice versa
- Needing to convert volume equivalents to calculate intravenous flow rates and to prepare wound irrigation solutions, enemas, or bladder irrigations

To convert litres to millilitres, multiply by 1000 or move the decimal three places to the right.

$$1 \text{ L} = 1000 \text{ mL}$$

$$0.25 \text{ L} = 250 \text{ mL}$$

To convert units of measurement within the apothecary system or the household system, consult an equivalence table. For example, when converting fluid ounces to quarts, recall that 32 ounces is the equivalent of 1 quart. To convert 8 ounces



Figure 33-7 Scored medication tablet. **Source:** Courtesy Mosby's GenRx 1999: The complete reference for generic and brand drugs (9th ed.). (1999). St Louis, MO: Mosby-Year Book.

$$250 \text{ mg}/125 \text{ mg} \times 5 \text{ mL} \times \text{Volume to administer}$$

The fraction 250/125 equals 2. Therefore,

$$2 \times 5 \text{ mL} = 10 \text{ mL to administer}$$

Some agencies require a nurse to double-check calculations with another nurse before administering the medication, especially when the risk of administering the wrong medication dose is high (e.g., heparin or insulin). Always double-check your calculations or confer with another nurse or health care provider if an answer to your calculation seems unreasonable.

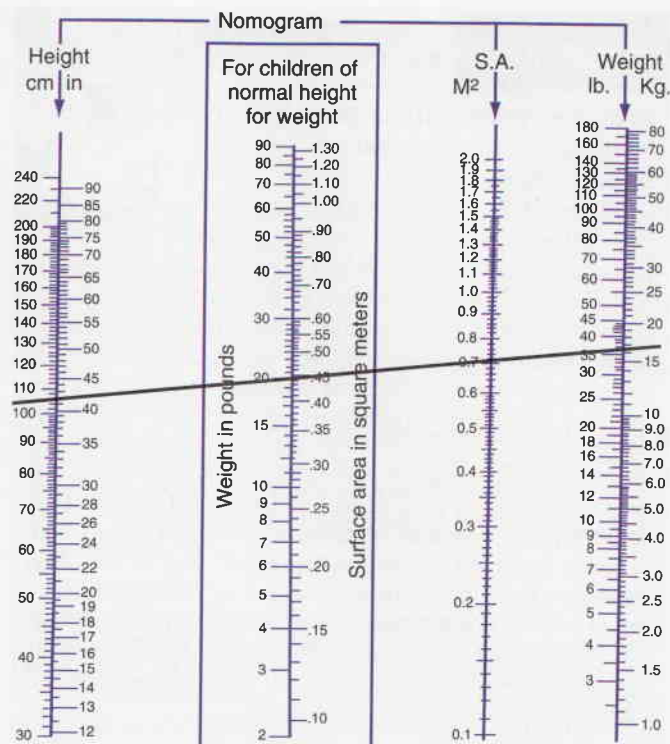
Pediatric Doses. Use caution when calculating children's medication doses. Children metabolize medications at different rates than adults. For example, premature and newborn infants are especially vulnerable to adverse effects of medications because their livers and kidneys have not matured to full functioning levels. After the newborn period, the liver metabolizes some drugs more quickly, which may require that the child receive either larger doses or more frequent doses (Hockenberry & Wilson, 2007). Medication dosages for children are also affected by difficulty in evaluating whether the medication has the desired effect and the hydration status of the child. In most cases, the prescriber will calculate the dose for a child before ordering the medication. However, you are responsible for the safe dose range for any medication administered to a child. Be aware of the formulas used to calculate pediatric doses and recheck all doses before administration. Drug package inserts or medication references often list the normal ranges for pediatric doses. Various formulas are used to determine the appropriate medication dosages for children. These formulas are often calculated on the basis of the child's age, weight, body surface area, and the medication amount. The most accurate method of calculating pediatric doses is based on a child's body surface area (Hockenberry & Wilson, 2007). Use Mosteller's formula or the standard nomogram (e.g., the West nomogram) to estimate a child's body surface area (Figure 33-8).

Use the following formula to calculate a pediatric dose. The formula is a ratio of the child's body surface area compared with the body surface area of an average adult, which is 1.7 square metres, or 1.7 m².

$$\text{Child's dose} = \frac{\text{Surface area of child}}{1.7 \text{ m}^2} \times \text{Normal adult dose}$$

For example, a prescriber orders ampicillin for a child weighing 12 kg. The normal adult dose for ampicillin is 250 mg. According to the West nomogram (see Figure 33-8), a child weighing 12 kg has a surface area of 0.54 m². Using this information, calculate the appropriate child's dose:

$$\text{Child's dose} = 0.54 \text{ m}^2 / 1.7 \text{ m}^2 \times 250 \text{ mg}$$



Alternative (Mosteller's formula):

$$\text{Surface area (m}^2\text{)} = \sqrt{\frac{\text{Height (cm)} \times \text{Weight (kg)}}{3600}}$$

Figure 33-8 West nomogram used to estimate the body surface area of children. A straight line is drawn between a child's height and weight. The point where the line crosses the surface area column is the child's estimated body surface area. **Source:** From Behrman, R. E., Kliegman, R., & Jenson, H. B. (2004). *Nelson textbook of pediatrics* (17th ed.). Philadelphia, PA: Saunders.

The m² units are cancelled out.

$$\text{Child's dose} = 0.54 / 1.7 \times 250 \text{ mg}$$

$$0.54 / 1.7 = 0.3$$

$$\text{Child's dose} = 0.3 \times 250 \text{ mg} = 75 \text{ mg}$$

An alternative method to determine medication doses for children involves basing the amount of medication to administer (usually in milligrams) on the weight of the child (usually in kilograms). For example, a prescriber orders 5 mg/kg to be given to a child weighing 14 kg. Using this information, calculate the appropriate dosage based on the following calculation:

$$\text{Child's dose} = 5 \text{ mg/kg} \times 14 \text{ kg} = 70 \text{ mg to be delivered}$$

Collectively, the prescriber and the pharmacist help to ensure the right medication is delivered to the right patient. The prescriber is a physician most often but can also be a nurse practitioner or pharmacist depending on individual provincial legislation in this area. For example, Bill 179, the *Regulated Health Professions Statute Law Amendment Act*, gives Ontario nurse practitioners and pharmacists open prescribing

privileges. Other provinces, like Alberta, also allow pharmacists to prescribe medications.

When you administer medications, you are accountable for knowing which medications are prescribed, their therapeutic and nontherapeutic effects, and any nursing implications associated with the medications. You are responsible for performing a physical assessment of the patient (e.g., monitoring and interpreting blood pressure before administering an antihypertensive medication) and, on the basis of data from the physical assessment, for determining whether a medication is safe to administer. You should also know why the patient needs the medication and be able to determine whether the patient needs supervision when taking the medication or education about the medication and its effects. Always monitor the effect of the drug after it is administered and report any reactions to the prescriber.

Prescriber's Role

The physician, nurse practitioner, or, in some provinces, the pharmacist prescribes the patient's medication by writing a medication order (**prescription**) on a form in the patient's medical record, in an order book, or on a legal prescription pad; by transmitting the information on a paper form through a facsimile (fax) machine; or by sending the information through a computer terminal. For each medication ordered, prescribers must document the patient's diagnosis, condition, or indication for use. A prescriber may also order a medication by talking directly to the nurse or by telephone. A medication or medical treatment ordered in this way is called a **verbal order**. When you receive a verbal order, read it back and receive confirmation from the prescriber to ensure accuracy (Box 33-4). Immediately enter the order into the patient's medical record and record the time and the name of the

► BOX 33-4

Recommendations Designed to Reduce Medication Errors Associated With Verbal Medication Orders and Prescriptions

Council Recommendations to Reduce Medication Errors Associated With Verbal Medication Orders and Prescriptions

Adopted February 20, 2001

Revised February 24, 2006

Preamble

Confusion over the similarity of drug names accounts for approximately 25% of all reports to the USP Medication Errors Reporting (MER) Program. To reduce confusion pertaining to verbal orders and to further support the council's mission to minimize medication errors, the following recommendations have been developed.

In these recommendations, verbal orders are prescriptions or medication orders that are communicated as oral, spoken communications between senders and receivers face to face, by telephone, or by other auditory device.

Recommendations

- Verbal communication of prescription or medication orders should be limited to urgent situations where immediate written or electronic communication is not feasible.
- Health care organizations* should establish policies and procedures that
 - Describe limitations or prohibitions on use of verbal orders
 - Provide a mechanism to ensure validity/authenticity of the prescriber
 - List the elements required for inclusion in a complete verbal order
 - Describe situations in which verbal orders may be used
 - List and define the individuals who may send and receive verbal orders
 - Provide guidelines for clear and effective communication of verbal orders
- Leaders of health care organizations should promote a culture in which it is acceptable, and strongly encouraged, for staff to question prescribers when there are any questions or disagreements about verbal orders. Questions about verbal orders should be resolved before the preparation, or dispensing, or administration of the medication.
- Verbal orders for antineoplastic agents should *not* be permitted under any circumstances. These medications are not administered in emergency or urgent situations, and they have a narrow margin of safety.
- Elements that should be included in a verbal order include
 - Name of patient
 - Age and weight of patient, when appropriate
 - Drug name
 - Dosage form (e.g., tablets, capsules, inhalants)
 - Exact strength or concentration
 - Dose, frequency, and route
 - Quantity and duration
 - Purpose or indication (unless disclosure is considered inappropriate by the prescriber)
 - Specific instructions for use
 - Name of the prescriber and, when appropriate, the telephone number
 - Name of individual transmitting the order, if different from the prescriber
- The content of verbal orders should be clearly communicated:
 - The name of the drug should be confirmed by any of the following:
 - Spelling
 - Providing both the brand and generic names of the medication
 - Providing the indication for use
 - To avoid confusion with spoken numbers, a dose such as 50 mg should be dictated as "fifty milligrams . . . five zero milligrams" to distinguish from "fifteen milligrams . . . one five milligrams."
 - To avoid confusion with drug name modifiers, such as prefixes and suffixes, additional spelling-assistance methods should be used (i.e., S as in Sam).
 - Instructions for use should be provided without abbreviations. For example, do not record "1 tab TID"; communicate the instruction as "Give one tablet three times daily."
 - Whenever possible, the receiver of the order should *write* down the complete order to enter it into a computer, then *read* it back, and receive confirmation from the individual who gave the order or test result.
- All verbal orders should be committed immediately to writing and the written record should be signed by the individual receiving the order.
- Verbal orders should be documented in the patient's medical record, reviewed, and countersigned by the prescriber as soon as possible.

*Health care organizations include community pharmacies, physicians' offices, hospitals, nursing homes, home care agencies, and so on.
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prescriber who gave the order (Joint Commission, 2007). Lastly, sign the record. Most institutions require a prescriber's signature within 24 hours after the order is made. Institutional policies vary regarding the personnel who are authorized to receive verbal or telephone orders. Nursing students cannot receive these types of medication orders. Nursing students give newly ordered medications only after the order has been written and verified by a registered nurse.

Common abbreviations are used when writing orders. Abbreviations indicate dosage frequencies or times, routes of administration, and special information for administering the medication (see Table 33-3). Caution must be exercised when you use abbreviations because some shortened forms can lead to confusion and the potential for medication errors (Table 33-7). It is important to know your agency's policies on abbreviations. Do not use error-prone abbreviations when documenting medication orders or other information about medications (Institute for Safe Medication Practices, 2006a; National Coordinating Council for Medication Error

Reporting and Prevention [NCCMERP], 2007; Joint Commission, 2007).

Types of Orders

Five types of medication orders are common in acute care settings: routine, "prn," single (one-time), "STAT," and "now" orders. Medication orders are based on the frequency and the urgency of medication administration. Some conditions change the status of a patient's medication orders. For example, in some agencies, the patient's preoperative medications are automatically discontinued after surgery, and the health care provider needs to write new medication orders (see Chapter 48). The prescriber should review the medications and write new orders when a patient is transferred to another health care agency, relocated to a different service within a hospital, or discharged.

Routine Medication Orders. A routine order is carried out until the prescriber cancels it by writing a new order or until a prescribed number of days have elapsed. A routine

► **TABLE 33-7** Abbreviations, Symbols, and Dose Designations With Potential for Errors in Medication Administration

Intended Abbreviation	Meaning	Misinterpretation	Correction
U or u	Unit	Can be mistaken for the number 0 or 4, causing a 10-fold overdose or greater (e.g., "4U" can be misread as "40," or "4u" can be misread as "44"); can be mistaken for "cc," causing the dose to be administered in volume instead of in units (e.g., "4u" can be misread as "4cc")	Write out "unit"
IU	International unit	Can be mistaken for "IV" (intravenous) or "10" (ten)	Write out "international unit"
Q.D., q.d., QD, or qd	Every day	Can be mistaken for "q.i.d.," especially if the period after the letter "q" or the tail of the letter "q" is misunderstood as the letter "l"	Write out "daily"
Q.O.D., q.o.d., QOD, or qod	Every other day	Can be mistaken for "q.d." (daily) or "q.i.d." (four times daily) if the letter "o" is poorly written	Write out "every other day"
MS, MSO ₄	Morphine sulphate	Can be mistaken for magnesium sulphate	Write out the complete drug name
MgSO ₄	Magnesium sulphate	Can be mistaken for morphine sulphate	Write out the complete drug name
µg	Microgram	Can be mistaken for "mg" (milligram)	Write the abbreviation "mcgram"
hs	At bedtime, hours of sleep (hora somna)	Can be mistaken for "half-strength"	Write out "bedtime" or "half-strength"
T.I.W. or tiw	3 times a week	Can be mistaken for 3 times a day or twice in a week	Write out "three times weekly"
S.C., S.Q., SC, and SQ	Subcutaneous	SC can be mistaken for S.L. (sublingual); SQ can be mistaken for the words "5 every": the letter "q" in "sub q" can be mistaken for the word "every" (e.g., a heparin dose ordered "sub q 2 hours before surgery" can be misunderstood as being required every 2 hours before surgery)	Write the abbreviation "subcut" or the term "subcutaneously"
D/C	Discharge or discontinue	When "discharge" is intended, can be mistaken for premature "discontinuation of medications," especially when followed by a list of discharge medications	Write out "discharge" and "discontinue"
cc	Cubic centimetres	Can be mistaken for the letter "u" (units)	Use the abbreviation "mL"

Adapted from The Joint Commission for Accreditation of Health Care. (2004). *2004 National patient safety goals: FAQs*. Retrieved from <http://www.premierinc.com/safety/safety-share/10-03-downloads/01-2004-JCAHO-no7-NPSG.doc>.

PRESCRIPTION

Superscription: The client's name, address, date of birth, and provincial health number are given for identification purposes.

Name: Arlene Casey
Address: 1010 First Street
Saskatoon, SK
PHN: 320 363 XXX
DOB: 04/20/1952
Date: March 8, 2009

Rx: Means "take thou" and per the inscription.

Rx: Amoxicillin, 500 mg
1 tablet
3 times a day for 10 days
Dispense 30 tablets

Inscription: Contains the drug name, strength, and dose.

Subscription: Directions to the pharmacist about the amount to be dispensed or refills.

Rfills: 0 times at intervals of _____

Signature: Information to be written on the label, such as directions to the client.

Jane Smith, MD
Physician's Signature
Jane Smith, MD
Physician (Please Print)

Physician Signature: The physician signs the prescription. If the drug is a controlled substance, the physician includes his or her registration number.

Figure 33-9 Sample medication prescription.

order may indicate a final date or the total number of treatments or doses. Many institutions have policies for automatically discontinuing routine orders. The following are examples of routine orders: "tetracycline 500 mg PO q6h" and "Decadron 10 mg daily $\times$ 5 days."

As-Needed ("prn") Orders. According to a "prn" order, a medication is to be given only when a patient requires it. Use your skills in objective and subjective assessment and discretion when determining whether the patient needs the medication. Often, the prescriber sets minimum intervals for the time of administration, which requires the medication not be given more often than a prescribed period of time. An example is "morphine sulphate 5 mg subcutaneously q3-4 h prn for incisional pain." This order indicates that the patient needs to wait at least three hours between doses. When administering medications, document the assessment made and the time of medication administration. Make frequent evaluation of the effectiveness of the medication and record your findings in the appropriate record.

Single (One-Time) Orders. A prescriber will often order a medication to be given only once at a specified time. This order is common for preoperative medications or medications given before diagnostic examinations: for example, "Versed 25 mg IM on call to OR" and "Valium 10 mg PO at 0900."

STAT Orders. A STAT order signifies that a single dose of a medication is to be given immediately and only once. STAT orders are often written for emergencies when the patient's condition changes suddenly: for example, "Give Apresoline 10 mg IV STAT."

Now Orders. A "now" order is more specific than a one-time order; it is used only once, when a patient needs medication quickly but not immediately, as in a STAT order. When you receive a "now" order, you have up to 90 minutes to administer the medication. An example of a "now" order is "Give Vancomycin 1 g IV piggyback now."

Prescriptions. The prescriber writes prescriptions for patients who are to be administered medications outside of the hospital setting. The prescription includes more detailed

information than a regular order because the patient must understand how to take the medication and when to refill the prescription if a refill is necessary. The parts of a prescription are illustrated in Figure 33-9. You need to assess the patient's accessibility to pharmacies and other health care resources to determine whether the patient needs additional support in the community.

Pharmacist's Role

The pharmacist prepares and distributes prescribed medications. Pharmacists work with nurses, physicians, and other health care providers to evaluate the efficacy of patients' medication. The pharmacist is responsible for filling prescriptions accurately and for ensuring the prescriptions are valid. The pharmacist in a health care agency rarely needs to mix compounds or solutions, except in the case of intravenous solutions. Most medication companies deliver medications in a form that is ready for use. The pharmacist's main task is dispensing the correct medication in the proper dosage and amount and labelling the medication accurately. The pharmacist also provides information about medication side effects, toxicity, interactions, and incompatibilities.

Distribution Systems

Systems for storing and distributing medications vary. Pharmacists provide the medications, but nurses distribute the medications to patients. Institutions that provide nursing care reserve a special area for stocking and dispensing medications. Examples of medication storage areas are special medication rooms, portable locked carts, medication cabinets with computer-controlled locking devices, and individual storage units next to patients' rooms. Ensure that all medications are in locked containers in a room (e.g., a medication room) or are under constant surveillance.

Stock Supply System. In a stock system, medications are available in quantity, in large, multidose containers. The stock system is time-consuming and costly because a nurse must dispense each medication separately for each patient.



Figure 33-10 Nurse using automated medication dispensing system.

This type of medication delivery has been associated with a high rate of medication errors and is not commonly used today.

Unit-Dose System. The unit-dose system uses portable carts containing a drawer with a 24-hour supply of medications for each patient. Each drawer is labelled with the name of a patient. The unit dose is the ordered dose of medication the patient receives at one time. Each tablet or capsule is wrapped in a foil or paper container. At a designated time each day, the pharmacist or a pharmacy technician refills the drawers in the cart with a fresh supply. The cart also contains limited amounts of “prn” and stock medications. Controlled substances are not kept in the individual patient drawers; they are kept in a larger locked drawer. The unit-dose system is designed to reduce the number of medication errors and to save the steps required when dispensing medications.

Automated Dispensing Systems. Automated medication dispensing systems (AMDS) are used successfully throughout Canada (Figure 33-10). These systems use computerized controls to dispense narcotics and unit-dose medication. Each nurse accesses the system by entering a security code. All procedures connected to an AMDS are controlled electronically via a patient’s profile. The patient’s name and drug profile must be accessed before the AMDS will dispense a medication. The nurse enters the patient’s identification number into the computer and selects the desired medication, the correct dose, and the route from a display on the computer screen. The system opens the drawer containing the medication and records the transaction. Nurses may also scan bar codes to identify the patient, medication (name, dose, route), and the nurse administering the medication. This information is then automatically recorded in a computerized database.

Nurse’s Role

Administering medications to patients requires knowledge and skills that are unique to nurses. You must first determine that the medication ordered is the correct medication. Do not assume that all medications in the patient’s drawer or pill box are to be given to the patient. Collect and interpret physical assessment data to determine whether a patient should receive a medication at a given time, administer medications correctly, and monitor the effects of prescribed medications. Assess the patient’s ability to self-administer medications. An integral part of your role is educating the patient and the patient’s family about proper medication administration and monitoring. Do not delegate any part of the medication administration

process to unregulated care providers, and use the nursing process to integrate medication therapy into nursing care.

Medication Errors. A medication error is any event that could cause or lead to a patient either receiving inappropriate medication therapy or failing to receive appropriate medication therapy. Most errors made by nurses are medication errors. A medication error can cause or lead to inappropriate medication use or patient harm. A medication error can occur when you neglect routine procedures, such as checking dose calculations; administer unfamiliar medications; neglect to administer an ordered medication; fail to comply with the ten rights of medication administration (see the section on Standards for a list of these 10 rights, p. 681); and fail to perform necessary assessments before medication administration (e.g., monitoring the patient’s blood glucose levels or blood pressure). Additional system issues that can lead to medication errors include distraction, illegible orders, transcription errors, and inappropriate use of abbreviations. Hospital medication delivery systems should be designed so that a system of checks and balances helps reduce medication errors. The most common types of medication administration errors made by students include (a) omission (i.e., a patient does not receive a prescribed medication), (b) a patient is given the improper dose or quantity, (c) the patient is given the medication at the wrong time, (d) the patient is given an extra dose, or (e) the medication is given to the wrong patient (Wolf et al., 2006).

To demonstrate accountability and acting responsibly in professional practice, you need to acknowledge your errors when they occur. Because nurses play an essential role in the preparation and administration of medications, you need to be vigilant in preventing medication errors (Box 33-5) and advocate for work environments that are conducive to safe medication administration (Box 33-6).

Medication errors can also result from the design of health care products or from procedures and systems, such as product labelling and distribution. When an error occurs, the patient’s safety and well-being is top priority. Assess the patient’s condition and notify the physician or prescriber of the medication error as soon as possible. You may need to take measures to counteract the error. After the patient’s condition has stabilized, report the incident to the appropriate person in the institution (e.g., a manager or supervisor).

When a medication error occurs, you are responsible for preparing a written occurrence or incident report, which usually needs to be filed within 24 hours of the error. The report includes the patient identification information; the location and time of the incident; an accurate, factual description of the error that occurred and measures taken to address the error; and your signature. The occurrence report is not a permanent part of the patient’s medical record and is not referred to in the record (see Chapters 8 and 17), which legally protects the health care provider and the institution. Institutions use occurrence reports to track incident patterns and to address quality improvement and risk-management issues. Many institutions have procedures in place for disclosing incidents to patients or their family members.

Report all medication errors, including errors that do not cause obvious or immediate harm and near misses. It is important for you to feel comfortable in reporting an error and not fear repercussions from managerial staff. Even when a patient suffers no harm from a medication error, the institution can still learn why the mistake occurred and what steps can be

► BOX 33-5

Steps to Take to Prevent Medication Errors

- Follow the 10 rights of medication administration.
- Be sure to read labels at least three times (comparing medication administration record with label) before, during, and after administering the medication.
- Use at least two patient identifiers whenever administering a medication.
- Do not allow any other activity to interrupt administration of medication to a patient.
- Double-check all calculations, and verify with another nurse.
- Do not interpret illegible handwriting; clarify with prescriber.
- Question unusually large or small doses.
- Document all medications as soon as they are given.
- When you have made an error, reflect on what went wrong and ask how you could have prevented the error.
- Evaluate the context or situation in which a medication error occurred. This helps to determine whether you have the necessary resources for safe medication administration.
- When repeated medication errors occur within a work area, identify and analyze the factors that may have caused the errors and take corrective actions.
- Attend in-service programs that focus on the medications commonly administered.

Adapted from National Coordinating Council for Medication Error Reporting and Prevention. (2007). *Recommendations for health care professionals to reduce medication errors associated with the label, labeling and packaging of pharmaceutical (drug) products and related devices*. Retrieved from <http://www.nccmerp.org/council/council1998-03-30b.html>. Reprinted with permission of the National Coordinating Council for Medication Error Reporting and Prevention. © 2006. Revised February 2007. All rights reserved.

taken to avoid similar errors in the future. Creating a **culture of safety** through strategies such as “Good Catch” or “Near Miss” reporting is becoming a popular method for addressing medication safety. Table 33-8 outlines error-prone conditions that lead to student nurse–related errors and specific strategies for avoiding these errors.

Medication errors often occur when a patient is transferred to a different unit within a hospital or to another health care agency. Therefore, reconciling the list of a patient’s medications during the transfer process is an important part of ensuring safe patient care (Joint Commission, 2007). Nurses play an essential role in medication reconciliation (Box 33-7).

When admitting a patient to any health care setting, compare the medications the patient took in the previous setting (e.g., at home or in another nursing unit) with the patient’s current medication orders (Ptasinski, 2007). When a patient is discharged, review the patient’s current medications with the health care providers in the new setting. This action, **medication reconciliation**, may be time-consuming, but it is an essential step in ensuring medication safety. When reconciling medications, consult with the patient, the patient’s caregivers and family members, the physician or advanced practice nurse, and the pharmacist.

Critical Thinking

Knowledge

To understand why a particular medication has been prescribed for a patient and how the medication will alter the

► BOX 33-6

Informatics and Medication Safety

Many medication errors occur when the nurse incorrectly administers medications at the patient’s bedside. The following innovations and advances in technology help to reduce the number of medication errors in nursing practice:

- Networked computers allow all the patient’s health care providers to see a current list of ordered and discontinued medications.
- Internet and intranet access allow nurses and other health care providers to access current information about medications (e.g., indications, desired effects, adverse effects) and specific agency policies that address medication administration (e.g., how fast to administer an intravenous [IV] push medication, how to administer medications through a nasogastric tube).
- In some agencies, prescribers enter medication orders directly into a networked computer system or a personal hand-held computer.
- Automated medication dispensing systems and electronic medication administration records help with medication reconciliation, administration, and documentation (Manno, 2006; Paoletti et al., 2007).
- Bar-coding technology requires nurses to scan the medication, the patient’s identification bracelet, and the nurse’s identification badge before administering the medication. This process helps to ensure compliance with the 10 rights of medication administration (Mills et al., 2006; Paoletti et al., 2007; Skibinski et al., 2007).

Application to Nursing Practice

- Actively participate in the selection and evaluation of advanced technologies and the creation of nursing policies and protocols used for medication administration.
- Always follow agency policies when administering medications.
- Implement agency policies for when the technology cannot be used (e.g., during computer down time or power outages).
- Follow the manufacturer’s guidelines for care of electronic equipment and report problems with technology immediately.

patient’s physiology and have a therapeutic effect, use knowledge you have acquired from many disciplines. For example, from physiology, you learn that potassium is a major intracellular ion. When patients do not have enough potassium in their body (hypokalemia), they experience signs and symptoms such as muscle fatigue or weakness. In some cases, severe hypokalemia is fatal because of the dysrhythmias that may occur as a result. To restore the patient’s potassium level to normal, medications may be prescribed, which will also relieve the patient’s signs and symptoms of hypokalemia.

Nurses administer a wide variety of medications, and new medications are constantly being approved for dispensation. As a result, you may not always have knowledge about the medications you are asked to administer. Responsible nurses admit what they do not know and acquire the knowledge needed to safely administer unfamiliar medications by consulting a medication book, electronic computer manuals, the prescriber, or a pharmacist.

Experience

Nursing students often have limited experience with medication administration as it applies to professional practice. Clinical experiences provide nursing students with the opportunity

► **TABLE 33-8** Error-Prone Conditions Leading to Student Nurse-Related Errors

Condition	Description	Strategies to Prevent Error
Preparing drugs for multiple patients	Preparing medications for multiple patients increases the risk of administering medications to the wrong patient.	Organize the medication process by preparing medications for one patient at a time. When preparing medications for multiple patients, apply patient labels to medication cups, removable needle caps of syringes, and IV bags. Use two unique identifiers to verify the correct patient before administering medications.
Nonstandard times	Medications scheduled for administration during nonstandard or less commonly used times are prone to dose omissions.	Develop a proactive plan with staff nurses to clarify the responsibility for administration of each ordered medication and how new medication orders received during the shift will be handled.
Documentation	When both staff nurses and student nurses are assigned to the same patients, neglecting to document or review previously administered medications can lead to dose omissions or extra doses.	Instructors and staff nurses should monitor the patient's MARs and review potential omissions with the student nurses. Both student nurses and staff nurses should use the same MAR. The patient's MAR should be taken to the patient's bedside and the drug administration should be documented immediately after the patient has been administered the medications. Review all sources of documented drug administration, especially for patients who are transferred from a different unit.
MARs unavailable or not referenced	Neglecting to take the MAR to the patient's bedside when administering medications can lead to errors.	Be involved in all verbal reports about the patients you are caring for. Always use MARs when preparing and administering medications; worksheets should not be used. Prepare medications in accordance only with the original MAR, and take the MAR to the patient's bedside for verification before administering medications. Always use two unique identifiers to verify the correct patients before administering medications.
Partial drug administration	Depending on the year of study, student nurses may not be involved in administering all of the prescribed medications to patients, such as IV medications.	For each unit that hosts student nurses, nursing instructors should provide a daily report that indicates the types of medications that the student nurses will and will not be administering.
Held or discontinued medications	Drugs that have been placed on hold or have been discontinued may be mistakenly administered when student nurses are unfamiliar with an agency's processes for holding and discontinuing medications.	At the beginning of your shift, confirm with the staff nurse responsible for your patient assignment the types of medications you will and will not be administering. Report medications that are not given when due. Agencies should annually review their procedures for holding medications and make necessary revisions to ensure that the process is clear and reliable.
Monitoring issues	Errors occur when nurses are unaware of medications that require vital signs monitoring or lab values assessment before medication administration.	Consult with nursing instructors and staff nurses regarding processes for holding or discontinuing medications. Ensure you know how to access the most recent lab values. Ensure you know which medications require vital signs monitoring (e.g., antihypertensive medications) and lab values assessment (e.g., warfarin) before being administered.
Nonspecific doses dispensed	Excessive doses have been administered when student nurses expect the drug is provided in a patient-specific dose, but the pharmacy has dispensed the drug in a larger dose or quantity.	The pharmacy should dispense medications in ready-to-use, patient-specific doses whenever possible; otherwise, provide further instructions on the MAR and the dose itself. On MARs, list the patient-specific dose first, as in the following example: "Lopressor 25 mg," followed by "25 mg = 1/2 of a 50 mg tab."
Oral liquids in parenteral syringes	Preparation of oral or enteral solutions in parenteral syringes can lead to nursing students incorrectly administering these products by the IV route.	Pharmacists should dispense all oral liquid products in oral syringes. Medication areas should be stocked with oral syringes. Use only oral syringes to prepare oral medications.

MAR, Medical administration record.

Adapted from Institute for Safe Medication Practices. (2007). *Error-prone conditions that lead to student nurse-related errors*. Retrieved from <http://www.ismp.org/Newsletters/acutecare/articles/20071018.asp?ptr=y>.

► BOX 33-7

Process for Medication Reconciliation

1. Verify: Obtain a current list of the patient's medications.
2. Clarify: Ensure the accuracy of the medications, dosages, and frequencies; clarify the content of the list with as many people as necessary (e.g., the patient, caregivers, health care providers, pharmacists).
3. Reconcile: Compare new medication orders against the current list; investigate any discrepancies by contacting the patient's health care provider.
4. Transmit: Communicate the updated and verified list to caregivers and the patient as appropriate.

Adapted from Ptasinski, C. (2007). Develop a medication reconciliation process. *Nurse Manager*, 38, 18.

to apply the nursing process to medication administration. As you gain experiences in medication administration, your psychomotor skills (the steps you take to complete the task) become more refined; however, psychomotor skills represent only a small part of medication administration. The patient's attitudes, knowledge, physical and mental status, and responses can make medication administration a complex experience.

Cognitive and Behavioural Attributes

Every step of safe medication administration requires a disciplined attitude and a comprehensive, systematic approach. To be consistent with professional, ethical, and legal nursing standards, you must always accept full responsibility for all your actions related to medication administration. When administering a medication to a patient, ensure that your nursing actions do not harm the patient in any way. Do not assume that the medication ordered for the patient is the correct medication or the correct dose. You can be held accountable for administering an ordered medication that is knowingly inappropriate for the patient. Thus, for all medications that you administer, you need to be familiar with the therapeutic effect, usual dosage, laboratory interferences, and side effects. Before administering medications, you must conduct a comprehensive physical assessment of the patient and critically analyze the assessment data. You are also responsible for ensuring that patients who will self-administer medications have been properly informed about all aspects of self-administration.

Institutional policy may limit your ability to administer medications in certain units in acute care settings. You may be limited by certain medication routes or by certain dosages. In most institutions, nursing procedure manuals list the institution's policies that define the classes of medications that nurses may and may not administer. The types and doses of medications that nurses may deliver can also vary from unit to unit within the same facility. For example, Dilantin, a powerful medication that is prescribed to treat seizures, may be administered by mouth or by IV push. In large doses, Dilantin can affect the rhythm of the heart. Therefore, when a nursing unit does not have the ability to monitor the patient's heart rate and rhythm, some institutions limit the amount of Dilantin that can be given to a patient. To ensure safe medication administration, you must adhere to evidence-informed practice guidelines and agency policy and procedure. Not all prescribers are aware of the limitations of all health care institutions and may

prescribe medications that cannot be given in a particular health care setting. You must recognize this possibility and ensure that the prescriber is informed of any limitations.

Standards

Standards are actions that ensure safe nursing practice. In Canada, the activity of medication administration by registered nurses is governed by the Canadian Nurses Association's *Code of Ethics* and professional practice standards set by provincial and territorial nursing associations. Nurses are legally and ethically responsible to acquire the knowledge needed to administer medications and to uphold the patient's rights, dignity, and uniqueness in the process. To ensure safe nursing practice, each time you administer a medication, you must be aware of the 10 rights of medication administration. All medication errors can be linked, in some way, to an inconsistency in adhering to the following 10 rights of medication administration:

1. The right medication
2. The right dose
3. The right patient
4. The right route
5. The right time and frequency
6. The right documentation
7. The right reason
8. The right to refuse
9. The right patient education
10. The right evaluation

Right Medication. A medication order is required for every medication you administer to a patient. When medications are first ordered, compare the medication administration record or computer order with the prescriber's written order. Always verify new medication information when new orders are written or when patients transfer from one nursing unit or health care facility to another (Joint Commission, 2007). When preparing medications, compare the label of the medication container with the medication form. Check the label against the medication form three times: (1) before removing the container from the drawer or shelf; (2) when the amount of medication ordered is removed from the container; and (3) before returning the container to storage. Never prepare medications from unmarked containers or from containers with illegible labels (Joint Commission, 2007). When you are using unit-dose prepackaged medications, check the label against the medication administration record when taking medications out of the medication dispensing system. After you determine that the information on the patient's medication administration record is accurate, the record is used to prepare and administer the medications. Verify all medications against the medication administration record at the patient's bedside before opening the medication packages and delivering the medications to the patient.

Administer only the medications that you prepare. If an error occurs, the nurse who administers the medication is responsible. If a patient questions the medication, do not ignore the patient's concerns. An alert patient will know whether a medication is different from one previously received. In most cases, the patient's medication order has been changed; however, the patient's questions might reveal an error. If an error does occur, withhold the medication and recheck it against the prescriber's orders.

Patients who self-administer medications should keep the medications in their original labelled containers, separate from

other medications, to avoid confusion. Many hospitals request that all medication in the hospital setting be administered by nurses, rather than allowing patients to self-administer; this process ensures that patients do not receive double doses of medication. If a patient refuses a medication, you should discard it; do not return it to the original container. Unit-dose packaged medications can be saved if they are unopened. However, because of infection control, some agencies require medication to be discarded if it has been taken into a patient's room. If a patient refuses narcotics, follow the proper hospital procedure of having another nurse witness the wastage of the medication.

Right Dose. The unit-dose system is designed to minimize errors. The chance of error increases when a medication must be prepared from a larger volume or strength than needed or when the prescriber, in ordering a medication, uses a system of measurement different from what the pharmacist supplies. When you perform a medication calculation or conversion, ensure that another nurse verifies the calculated dose.

After confirming the calculated dose, prepare the medication by using standard measurement devices. Use graduated cups, syringes, and scaled droppers to measure medications accurately. At home, patients should use measuring spoons and cups, not household spoons and cups, which vary in volume.

Only tablets that are scored by the manufacturer should be broken. When you need to break a scored tablet, ensure the break is even. You may cut a tablet in half by using a knife or a pill-cutting device. Discard tablets that do not break evenly. Some agencies allow nurses to save the unadministered portion of the scored medication tablet for subsequent doses if the remaining tablet is repackaged and labelled. Verify with agency policy before administering a tablet that has been opened, cut, and repackaged. In the home care setting, pill splitting is particularly problematic. The Institute for Safe Medication Practices (2006b) has developed suggestions to help with this process. Determine whether the patient has both the motor dexterity and visual acuity needed to split tablets. If possible, prescribers need to avoid ordering medications that require splitting.

Often a nurse prepares a tablet by crushing it so that it can be mixed in food. The crushing device should always be cleaned completely before the tablet is crushed. Remnants of previously crushed medications may increase a medication's concentration or result in the patient receiving a portion of an unprescribed medication. Crushed medications should be mixed with very small amounts of food or liquid. Do not mix crushed medications with the patient's favourite foods or liquids because a medication may alter the taste of the food or liquid, and thereby decrease the patient's desire for them. Pay particular attention to this concern when administering crushed medications to pediatric patients.

safety alert Not all medications can be crushed. Some medications, such as time-released or extended-release capsules, are coated with special material to prevent the medication from being absorbed too quickly. Before crushing a medication, refer to a medication manual or another medication reference to ensure that the medication can be safely crushed.

Right Patient. Medication errors often occur because one patient receives a medication intended for another patient. An important step in administering medications safely is to



Figure 33-11 Before administering any medications, the nurse checks the patient's identification bracelet. **Source:** From deWit, S. (2009). *Fundamental concepts and skills for nursing* (3rd ed., p. 647, Fig 33-4). Philadelphia, PA: W. B. Saunders.

ensure medications are given to the right patient. Remembering every patient's name and face is difficult. To identify a patient correctly, check the medication administration record against the patient's identification bracelet and ask the patient to state his or her name to ensure that the patient's identification bracelet has the correct information (Figure 33-11).

If an identification bracelet is missing or the text is smudged or illegible, acquire a new bracelet for the patient. When asking the patient's name, you should not merely speak the name and assume that the patient's response indicates that he or she is the right person. Instead, ask the patient to state his or her full name. To avoid making the patient feel uneasy, simply explain that the question is routine for giving a medication.

Right Route. If a prescriber's order does not designate a route of administration, or if the specified route is not the recommended route, always consult with the prescriber.

When administering injections, take precautions to ensure that the medications are given correctly. Prepare injections only from preparations designed for parenteral use. The injection of a liquid designed for oral use can produce local complications, such as a sterile abscess, or fatal systemic effects. Medication companies label parenteral medications "for injectable use only."

Right Time and Frequency. Nurses must know why a medication is ordered for certain times of the day and whether the time schedule can be altered. For example, two medications are ordered: one q8h (every 8 hours) and the other three times a day. Both medications are scheduled three times within a 24-hour period. The prescriber intends the q8h medication to be given around the clock to maintain therapeutic blood levels of the medication. In contrast, you need to give the three-times-a-day medication during the waking hours. Each institution has a recommended time schedule for medications ordered at frequent intervals. You may alter these recommended times if necessary or appropriate.

The prescriber often gives specific instructions for the timing of administration of a medication. For example, when a preoperative medication is to be given "on call," you need to administer the medication when the operating room notifies the nursing unit that the patient can be transferred for surgery.

A medication ordered *pc* (after meals) is to be given within half an hour after a meal, when the patient has a full stomach. A *STAT* medication is to be given immediately.

Give priority to medications that must act at certain times. For example, insulin should be administered at a precise interval before a meal. Antibiotics should be administered on time around the clock to maintain therapeutic blood levels. All routinely ordered medications should be given within 60 minutes of the times for which they are ordered (i.e., 30 minutes before or after the prescribed time).

Some medications require you to use your clinical judgement to determine the proper time for administration. A “*prn*” sleeping medication should be administered when the patient is prepared for bed or at another time appropriate for maximum benefit. Use your judgement when administering “*prn*” analgesics. For example, you may need to obtain a *STAT* order from the prescriber if the patient requires a medication before the “*prn*” interval has elapsed. Always document your calls to the patient’s prescriber that were made to obtain a change in the medication order.

Before a patient is discharged from the hospital setting, evaluate the patient’s need for home care, especially if the patient was admitted to the hospital as the result of a problem with medication self-administration. Patients often leave the hospital with a basic knowledge of their medications but are unable to retrieve and implement this knowledge after they return home. Before discharge, evaluate whether medications are adequate or are prescribed at therapeutic levels for the patient. At home, a patient may need to take several medications throughout the day. Help patients to plan their schedules on the basis of preferred medication intervals, the medications’ pharmacokinetics, and the patients’ own daily schedule. For patients who have difficulty remembering when to take medications, make a chart that lists the times when each medication is to be taken or prepare a special container to hold each timed dose.

Right Documentation. Nurses and other health care providers use accurate documentation to communicate with each other. Correct documentation is essential to ensure safe medication administration. Because medication errors may result from inaccurate documentation, ensure that the documentation is appropriate before giving the medications. Appropriate documentation includes the patient’s name; the name of the ordered medication written out in full (no medication name abbreviations); the time the medication was administered; and the medication’s dose, route, and frequency. Common problems with medication orders are incomplete information, inaccurate dose form or strength, illegible orders or signatures, incorrect placement of decimals leading to the wrong dosage, and nonstandard terminology (Hughes & Ortiz, 2005). If any pieces of information are missing, contact the prescriber to verify the order. The prescribing health care provider is responsible for providing accurate, complete, and understandable medication orders.

After you administer a medication, complete the medication administration record according to agency policy to verify that the medication was administered as ordered. You are also responsible for documenting any preassessment data regarding the administration of certain medications (e.g., antihypertensive medications, blood glucose-lowering agents, and medications for pain management). Inaccurate documentation of medications, such as failing to document an administered medication or documenting an incorrect dose, can lead to

errors in subsequent decisions about the patient’s care. For example, errors in documentation about insulin often result in negative patient outcomes. Consider the following situation: a patient receives insulin at breakfast, but the nurse who gave the insulin neglected to document it. The nurse goes home, and a new nurse is assigned to care for the patient. The new nurse notices that the previous nurse did not document the insulin and assumes that the ordered insulin was not given. Therefore, the new nurse gives the patient another dose of insulin. Two hours later, the patient experiences a low blood glucose level that causes the patient to experience seizures. Timely and accurate documentation would have prevented this situation.

Right Reason. Nurses are professionally responsible for obtaining the rationale for prescribed medications. If you are unaware of a new medication, you have the professional responsibility to research the medication by using the following sources: the *Compendium of Pharmaceuticals and Specialties (CPS)*, drug manuals, or electronic drug information databases. When retrieving information about a medication, be attentive to nursing implications, including routes of administration, preadministration physical assessments, expected onset of action, contraindications, and follow-up nursing assessments and evaluation for both adverse effects and desired responses. You are professionally obligated to contact the prescriber for verification in any of the following situations: a prescriber orders a drug that you identify as contraindicated on the basis of either the patient’s medical history or the patient’s current condition, the ordered dose exceeds the recommended limits, or the ordered route is contraindicated for the patient. Being vigilant in critically assessing a patient’s medication regimes is essential to maintain patient safety.

Right to Refuse. With the emerging focus on patient-centred care and the recognition that patients are not passive recipients of care, more attention has been given to ensuring that the rights of patients are also upheld during the medication administration process (MacDonald, 2010). Thus, it is important to remember that a patient has the right to refuse a medication. Patients need to be informed that they have this right, but at the same time, they also need to be fully informed about the potential consequences of their refusal. If a patient refuses medication therapy, do not become defensive. Recognize that every person of consenting age has the autonomous right to refuse a medication.

Right Patient Education. In order for patients to be fully informed about their medication and the consequences of refusing to take it, it is imperative that they receive the right education about their medications and their overall treatment plan. For some patients, education may be required for family members as well, particularly if they are involved in helping patients manage their medications at home. Education should include providing information about the drug being given such as the reason for taking it, its action, and possible side effects that the patient might experience while taking it. This information is important for patients and their family members to know to ensure patient safety (Canadian Institute for Health Information [CIHI], 1998). Patients and their family members need to be involved in the decision-making process about managing and administering medications and, to achieve this, they need the right information.

Right Evaluation. Patients also need to have the right evaluation at the appropriate times. Before a medication is given, you need to check to make sure that the medication

order is correct and that the medication is available and accessible to the patient. You need to follow up with the pharmacy or prescriber if you have any concerns or questions about the medication.

You also need to make sure that any special assessments that are required have been completed, such as taking a pulse or blood pressure or checking important laboratory results that are necessary for a particular medication. If you are working in the community, it is essential to ensure that patients and/or their family members have the necessary equipment and resources that facilitate safe and effective administration of medications. This assessment should include a thorough functional and cognitive assessment since many older adults are faced with several conditions, such as cognitive impairments and physical limitations, which may affect their ability to manage their medications properly.

Once a medication has been given, careful monitoring of the effectiveness of the medication, its side effects, and signs of adverse reactions and/or drug interactions is necessary. If the medication has not achieved its desired effect, additional follow-up is needed. Within a collaborative model of care, nurses should be working closely with pharmacists and physicians if further follow-up or assessments are necessary (MacDonald, 2010).

Risk Management: Agency Policy and Procedure.

Most institutions have nursing policy and procedure manuals to guide nursing practice. These manuals are updated annually based on current evidence-informed practice literature. Policy and procedure manuals contain vital information for medication administration, including the types of medications nurses are permitted to administer, the preparation of medications, the administration of medications, and guidelines for evaluating patient's response to medications. For example, some agencies require nurses to complete specialized training to qualify them to safely administer intravenous chemotherapeutic agents. Furthermore, the administration of certain medications (e.g., intravenous inotropic medications for regulating a patient's blood pressure) are prohibited on general medicine and surgery units and permitted only in critical care areas where the patient is continuously monitored for responses to medication therapy.

Maintaining Patients' Rights. Because of the potential risks related to medication administration, patients have the right to the following:

- To be informed of the medication's name, purpose, action, and potential undesired effects
- To refuse a medication regardless of the consequences
- To have qualified nurses or physicians assess their medication history, including allergies and use of herbal therapies (Box 33-8)
- To be properly advised of the experimental nature of medication therapy and to give written consent for its use
- To receive labelled medications safely without discomfort in accordance with the 10 rights of medication administration
- To receive appropriate supportive therapy in relation to medication therapy
- To not receive unnecessary medications
- To be informed whether medications are part of a research study

Be aware of these rights and handle all inquiries by patients and their families courteously and professionally.

BOX 33-8 Nursing Assessment Questions

- What prescription and nonprescription medications do you take, when do you take them, and how do you take them? Do you have a list of medications from your pharmacy or your health care provider?
- What are your medications for?
- What side effects have you experienced?
- Have you ever stopped taking your medications? If so, why did you stop taking them?
- How do you help yourself to remember to take your medications?
- Do you have any allergies to medications or foods? If so, describe what happens when you take the medication or eat the food.
- Describe your normal eating patterns. What foods do you eat, and at what times do you normally eat?
- How do your religious or cultural beliefs influence your beliefs about your medications?
- How do you pay for your medications? Do you have additional insurance through your employer or pension plan to help cover the costs of your medication? Do you live close to a pharmacy? How do you access prescription medications in your community?
- What questions do you have about your medications?

Nursing Process and Medication Administration

Assessment

To determine the need for and potential response to medication therapy, nurses assess many factors. To ensure safe medication administration, perform thorough physical assessments of all patients before administering medications.

History

Before administering medications, you need to obtain or review the patient's medical history. A patient's medical history provides indications or contraindications for medication therapy. A patient who has disease or illness is at risk for adverse medication effects. For example, if a patient has a gastric ulcer, compounds containing aspirin will increase the likelihood of bleeding. If a patient has a long-term health condition, such as diabetes or arthritis, the patient requires medications to treat these conditions. A patient's surgical history may also indicate the use of medications. For example, after a thyroidectomy, a patient may require hormone replacement.

History of Allergies

If the patient has a history of contact allergies or allergies to medication or food, inform the other members of the health care team. Food allergies should be carefully documented because many medications include ingredients also found in food sources. For example, a patient who is allergic to shellfish may also be sensitive to any product containing iodine, such as Betadine or dyes used in radiological testing. To ensure patient safety, when patients are admitted to a hospital, they are issued an identification band that lists the medications they are allergic to. Ensure that all allergies are noted on the nurse's admission notes, the medication records, and the physician's documentation of the patient's history.

Medication Data

Assess information about each medication that the patient takes, including length of time the medication has been taken, the current dosage, and whether the patient has experienced any adverse effects. Review the medication data, including the action, purpose, normal dosages, routes, side effects, and nursing implications for administration and monitoring. Common questions to ask include the following: Is the smallest possible dose ordered? (a question pertinent for medications ordered for older adults) Can a certain medication interact with other medications the patient is taking? Are special instructions required for administering the medication? Often, several resources must be consulted to gather the information you need. Some valuable resources are pharmacology textbooks, nursing journals, the *Compendium of Pharmaceuticals and Specialties (CPS)*, online medication manuals, medication package inserts, nursing journals, and the pharmacist. You are responsible for knowing as much as possible about each medication you administer. Many nursing students prepare or purchase cards containing medication data to use as a quick resource.

Diet History

A diet history reveals the patient's normal eating patterns and food preferences. Nurses can then plan the dosage schedule more effectively and advise patients to avoid foods that may interact with their medications. Be aware of patients' cultural preferences for food, and if these foods interact with medications, provide the patients and their families with comprehensive, respectful explanations.

Patient's Perceptual or Coordination Problems

For a patient with limited perceptual, fine motor, or coordination skills, self-administration of medication may be difficult. For example, a patient with arthritis who takes insulin to manage blood glucose levels may have difficulty manipulating a syringe. Always assess the patient's ability to prepare doses and take medications correctly. If the patient is unable to self-administer medications, determine whether a family member or friend will be available to assist the patient, or collaborate with the interdisciplinary team to refer the patient to a home care service that can assist in medication administration.

Patient's Current Condition

The physical or mental status of a patient may affect whether a medication is given or how it is administered. Carefully assess a patient before giving any medication. For example, check the patient's blood pressure before giving an antihypertensive medication. A patient who is nauseated may be unable to swallow a tablet. Assessment findings also serve as a baseline in evaluating the effects of medication therapy.

Patient's Attitude Toward Medication Use

The patient's attitude about medications may reveal the patient's level of medication dependence or drug avoidance. Patients may not express their feelings about taking a particular medication, particularly if they have become dependent on it. Observe the patient's behaviour for evidence of medication dependence or avoidance. Also be aware that the patient's cultural beliefs about Western medicine could interfere with medication compliance (Box 33-9 and see Chapter 9).

* BOX 33-9 CULTURAL ASPECTS OF CARE

Influences on Medication

Administration

Health beliefs vary by culture and often influence how patients manage and respond to drug therapy. Differences in values, beliefs, and attitudes affect a patient's compliance with drug therapy. For example, cultures attach different symbolic meanings to medications and drug therapy.

Herbal remedies and alternative therapies are common in some cultures and ethnic groups and can interfere with prescribed medications. In addition, differences between the health beliefs of health care providers and their patients can affect a patient's compliance with medical therapy.

Demographic changes in both age and race can affect the nursing practice in medication administration. In addition to the psychosocial aspect of medication therapy, pharmacological research has shown that some ethnic and racial groups experience differences in drug response, metabolism, and side effects.

Implications for Practice

- Assess a patient's cultural beliefs, attitudes, and values when administering medications and teach patients about their medications.
- Resolve conflicts between medications and cultural beliefs to achieve optimal patient outcomes.
- Ask whether the patient practises any alternative therapies or takes any herbal preparations.
- If a patient is not responding to drug therapy as expected, consider whether cultural influences affect the drug response, the rate at which it is metabolized, and side effects. Bear in mind that a change in the patient's medication is sometimes necessary.
- Always exercise awareness of your personal beliefs and distinguish between your values and the patients'.

Data from Andrews, M. M., & Boyle, J. S. (2007). *Transcultural concepts in nursing care* (5th ed.). Philadelphia, PA: Lippincott; and McKenry, L. M., Tessier, E., & Hogan, M. A. (2006). *Mosby's pharmacology in nursing* (22nd ed.). St Louis, MO: Mosby.



Patient's Knowledge and Understanding of Medication Therapy

The patient's knowledge and understanding of medication therapy influence the willingness or ability to follow a medication regimen. Compliance is unlikely unless a patient understands the medication's purpose, the importance of regular dosage schedules and proper administration methods, and the medication's possible side effects. When assessing a patient's knowledge of a medication, ask, "What is it for? How is it taken? When is it taken? What side effects have you experienced? Have you ever stopped taking doses? Is there anything else you do not understand about the medication but would like to know?" When the patient has a history of poor compliance, review resources available for the purchase of medications.

Patient's Learning Needs

Determine the need for instruction by assessing the patient's level of knowledge about a medication and the resources available to help the patient to take medications regularly. You may need to explain the action and purpose of the medication, the expected side effects, the correct administration techniques,

and steps the patient can take to remember the medication regimen. If a patient has a newly prescribed medication, your instruction will need to be more involved.

❖ Nursing Diagnosis

Assessment of the patient provides data about the patient's condition, the ability to self-administer medications, medication management (e.g., diabetic management), and medication use patterns, which can be used to determine actual or potential problems with medication therapy. Certain data are defining characteristics; when clustered together, they reveal nursing diagnoses. For example, noncompliance related to a medication regimen may be indicated when a patient admits that he or she is not taking prescribed medications correctly, or when evidence shows that a medication has not reversed symptoms as expected. The following nursing diagnoses may be observed during the administration of medications:

- *Anxiety*
- *Ineffective health maintenance*
- *Health-seeking behaviours*
- *Deficient knowledge of medications*
- *Noncompliance with prescribed medications*
- *Disturbed visual sensory perception*
- *Impaired swallowing*
- *Effective therapeutic regimen management*
- *Ineffective therapeutic regimen management*

After the patient's diagnosis has been selected, identify the related factors, which guide the selection of nursing interventions. For example, the related factors of inadequate resources and lack of knowledge require different interventions. If the patient's noncompliance is related to inadequate finances, collaborate with the patient's family members, social workers, or community agencies to ensure the patient receives the necessary medications. If the related factor is lack of knowledge, initiate referrals to ensure home care nurses follow up with the patient and that they implement an extensive teaching plan.

❖ Planning

Organize care activities to ensure the safe administration of medications. Hurrying to give patients medications can lead to errors. When preparing and administering medications, it is important to minimize distractions and interruptions (Pape et al., 2005).

Goals and Outcomes

Setting goals and related outcomes will help you to use your time wisely during medication administration. For example, establish the following goal and related outcomes for a patient with newly diagnosed type 2 diabetes:

Goal: The patient will safely administer all ordered medications before discharge.

Outcomes:

- The patient will express an understanding of the desired effects and the adverse effects of medications.
- The patient will state the signs, symptoms, and treatment of hypoglycemia.
- The patient will be able to monitor and interpret blood glucose levels to determine medication management or treatment for hypoglycemia.
- The patient will establish a daily routine that will coordinate timing of medication with mealtimes.

Setting Priorities

Prioritize care when administering medications. Use information gathered from your assessment of the patient to determine whether the administration of medications is appropriate and, if it is, which medication should be given first. For example, if a patient is in pain, provide pain medication as soon as possible. If the patient is experiencing an elevated blood pressure, antihypertensive medications should be administered before other medications. Establish priorities when providing patient education about medications. Provide the most important information about the medications first. For example, because hypoglycemia is a serious side effect of insulin, the patient must be able to identify and treat hypoglycemia before learning how to administer an insulin injection.

Collaborative Care

Nurses collaborate with a variety of health care providers when administering medications. It is also important when giving instruction to collaborate with the patient's family or friends, who can reinforce the importance of medication regimens in the patient's home setting. Interdisciplinary collaboration with the prescriber, the pharmacist, and the home care case manager helps to ensure the patient receives medications safely. Ensure that patients are able to read both medication labels and printed teaching sheets. Collaborate with community resources (e.g., the home care nurse, social workers) if patients have difficulty in understanding medication management, adhering to medication routines due to functional ability, or accessing resources because of physical or financial restrictions.

When patients are hospitalized, do not postpone their medication and discharge instructions until the day of discharge. For the patient to understand medications and self-administration guidelines, you must allow sufficient time for questions and discussion. Early planning is critical. Whether a patient attempts self-administration or a nurse assumes responsibility for administering medications, the following goals and expected outcomes must be met: (a) the patient and the patient's family understand the medication therapy; (b) the patient gains the therapeutic effect of the prescribed medications without discomfort or complications; (c) the patient experiences no complications related to the route of administration; and (d) the patient can safely self-administer the prescribed medications.

❖ Implementation

Health Promotion

When working with patients to promote and maintain their health, you need to identify factors that may improve or diminish their well-being. Beliefs about health, personal motivations, socioeconomic factors, and habits (e.g., smoking) can influence the patient's compliance with the medication regimen.

Teaching the patient and the patient's family about the benefit of a medication and the knowledge needed to take it correctly is an essential component of primary health care and can promote adherence to the medication regimen (Box 33-10). Integrating the patient's health beliefs and cultural practices into the treatment plan can assist in establishing a schedule or routine with the patient. You may make referrals to community resources if the patient cannot afford to purchase the necessary medications, or if the patient cannot arrange transportation to obtain the necessary medications. You should

* BOX 33-10

FOCUS ON PRIMARY
HEALTH CARE**Improving Drug Compliance**

When a patient is discharged from hospital or sent home from a visit to a clinic, the ongoing treatment may include regularly taking medications at home. In cases of chronic illness, the success of the treatment may depend on the patient's compliance with drug therapy. Nurses can play an important role in assisting patients to comply with their medication regimen.

The following suggestions may improve patient compliance:

- Ensure that the patient and the patient's family understand the reason for the medication, proper administration of the medication, and the possible consequences of noncompliance.
- Ensure that the patient and the patient's family and friends are able to recognize symptoms of medication side effects or toxicity, such as physiological changes and alterations in behaviour. Because the patient's family members and friends are often the first people to recognize such effects in the patient, they are an important resource for ensuring patient compliance.
- Teach proper self-administration of medications to patients for all routes. For example, demonstrate how to accurately measure a liquid medication. Show the patient how to prepare and administer an injection correctly by using aseptic technique. Assess the patient's ability to self-administer injections. If a patient cannot independently self-administer injections, family members or friends can be taught to administer the injections. Alternatively, collaborate with community and home care services to administer injections when patients are discharged to their home. Provide specially designed equipment as necessary, such as syringes with enlarged calibrated scales for easier reading or Braille-labelled medication vials.
- Help the patient to address any economic issues that might affect compliance.
- Explore with the patient any factors that will influence his or her ability to comply; for some patients, keeping a daily medication log may be helpful.
- Provide a written schedule that includes the name of the medication, the dose, and a description or picture of the medication.
- Encourage patients to take their medication in conjunction with an activity they do every day, such as brushing their teeth or having breakfast.
- Help patients to organize their pills into a box with daily dividers. If compliance is a major concern, home care nurses or family members can check the box and refill it on a weekly basis.
- Work with the patient's pharmacist to ensure the pharmacy calls to remind the patient when a refill is required.



teach all patients the basic guidelines for medication safety. These guidelines ensure the proper use and storage of medications in the home (Box 33-11).

Acute Care

Patients are often hospitalized to receive expert nursing observation and documentation of their responses to medications. When receiving a medication order, several nursing interventions are essential for safe and effective medication administration.

Receiving Medication Orders. A medication order is required for any medication to be administered by a nurse.

* BOX 33-11

PATIENT TEACHING

Safe Insulin Administration**Objective**

- The patient will correctly administer subcutaneous insulin.

**Teaching Strategies**

- Instruct the patient how to determine that insulin is not out of date.
- Instruct the patient to keep insulin in its original labelled container.
- Instruct the patient to keep insulin refrigerated if necessary.
- Assess the patient's visual acuity to ensure that the patient is able to prepare the appropriate amount of insulin.
- Demonstrate how to rotate the location of insulin injection sites.
- Help the patient to determine the amount of insulin required based on the results of home capillary glucose monitoring, as ordered by the patient's health care provider.
- Observe the patient's ability to correctly assess the results of capillary blood glucose monitoring.
- Demonstrate to the patient how to prepare a single insulin preparation.
- Demonstrate to the patient how to administer a subcutaneous insulin injection.
- Show the patient how to keep a daily log book to record insulin injections, including results of home capillary glucose monitoring, type and amount of insulin given, expiration date on insulin vial, time of insulin injection, and injection site used.

Evaluation

- Ask the patient to describe the signs and symptoms of hypoglycemia and the associated interventions.
- Ask the patient to describe the procedure used at home for determining the correct dose of insulin needed and the injection site.
- Observe the patient preparing an insulin dose on the basis of the results of capillary glucose monitoring.
- Observe the patient selecting the injection site and self-administering the insulin injection.
- Review the information recorded in the patient's log book for completeness.

Before any other interventions, ensure the medication order contains all the elements in Box 33-12. If the medication order is not complete, inform the prescriber and ensure completeness before carrying out the medication order.

Correct Transcription and Communication of Orders. Nurses or a designated unit secretary sometimes write the prescriber's complete order on the appropriate medication form, the medication administration record. The transcribed order includes the patient's name, identification number, room, bed number, allergies, and the medication name, dose, frequency, and route of administration. Each time a medication dose is prepared, refer to the medication form. When the unit-dose system is used, only one transcription is necessary, which limits the opportunity for errors. When transcribing orders, ensure that names, doses, and symbols are legible. Rewrite any smudged or illegible transcriptions.

Some institutions have prescribed order entry. The prescriber enters an order directly into the computer, which avoids the need for the transcription of orders. Computer interfaces

► BOX 33-12 Components of Medication Orders

A complete medication order includes all the following information:

- **Patient's full name:** The patient's full name distinguishes the patient from other persons with the same last name. In an acute care setting, patients may also be assigned a special identification number (e.g., a medical record number) to help differentiate patients with the same names. This number may be included on the order form.
- **Date and time the order is written:** The day, month, year, and time must be listed. Designating the time that an order is written helps to clarify when certain orders are to stop automatically. If an incident occurs involving a medication error, documentation is easier when this information is available.
- **Medication name:** The prescriber will order a medication by its generic or trade name. Correct spelling is essential to prevent confusion with medications with similar spelling.
- **Dose:** The amount or strength of the medication is included.
- **Route of administration:** The prescriber uses accepted abbreviations to indicate the medication routes. Accuracy is important because some medications can be administered by more than one route.
- **Time and frequency of administration:** Nurses need to know when to initiate medication therapy. Orders for multiple doses establish a routine schedule for medication administration.
- **Signature of prescriber:** The prescriber's signature makes the order a legal request.

transfer the order to the medication administration record, the pharmacy record, and the automated dispensing system. The computer printout may be used as the medication administration record (Figure 33-12).

Always check all transcribed orders against the original order for accuracy and thoroughness. If an order is incorrect or inappropriate, consult the prescriber. If you give the wrong medication or an incorrect dose, you are legally responsible for the error. Other health care providers involved in the error are also legally responsible.

Accurate Dose Calculation and Measurement.

When measuring liquid medications, use a standard measuring container to reduce the chance of error. Calculate each dose when preparing the medication, pay close attention to the process of calculation, and avoid interruption from other nursing activities (Pape et al., 2005).

Consult with other nurses when calculating a new or unusual dose.

Correct Administration. To help ensure safe administration, use aseptic techniques and proper procedures when handling and giving medications. Verify the patient's identity by using at least two patient identifiers (Joint Commission, 2007) and perform the necessary assessments (e.g., assessing heart rate before giving antidysrhythmic medications). Carefully monitor the patient's response to medication, especially when administering the first dose of a new medication. Document the patient's response on the appropriate record forms.

Recording Medication Administration. After administering a medication, record it immediately on the appropriate record form (see Figure 33-12). Never chart a medication before administering it. Recording the medication immediately after its administration prevents errors.

The recording of a medication includes writing the name of the medication, the dose, the route, and the exact time of administration. Record assessment parameters (e.g., blood glucose level, blood pressure, pain score) and the site of any injections, in accordance with agency policy.

If a patient refuses a medication or undergoes tests or procedures that result in a missed dose, the reason the medication was not given must be recorded in both the medication administration record and nurse's notes.

Restorative Care

Medication administration activities vary among the numerous types of restorative care settings. Patients with functional limitations may require you to fully administer all medications. In the home setting, patients usually administer their own medications. Regardless of the type of medication activity, you are responsible for instructing patients and their families in medication action, administration, and side effects. Additionally, you need to monitor the patient's compliance with medication and determine the effectiveness of medications that have been prescribed.

Special Considerations for Administering Medications to Specific Age Groups

A patient's developmental level affects the way that nurses administer medications. Your knowledge of a patient's developmental needs helps you to anticipate responses to medication therapy.

Infants and Children. Children vary in age, weight, body surface area, and their ability to absorb, metabolize, and excrete medications. Children's medication doses are lower than doses for adults; therefore, special caution is needed when preparing medications for children. Medications are usually not prepared and packaged in standardized dose ranges for children. Preparing an ordered dose from an available amount of medication requires careful calculation.

All children require special psychological preparation before receiving medications. The child's parents are valuable resources for learning the best way to administer medications to their child. Sometimes the child will experience less trauma if a parent administers the medication and you supervise.

Supportive care is needed if a child is expected to cooperate. Explain the procedure to the child, using short words and simple language appropriate to the child's level of comprehension. Long explanations may increase the child's anxiety, especially for painful procedures such as an injection. You need to administer medications to children even when they refuse to cooperate or resist consistently despite explanation and encouragement. If the child is uncooperative, administer the medication to the child quickly and carefully (Hockenberry & Wilson, 2007). If you are able to involve the child, you may have greater success giving a medication. For example, when you say, "It's time to take your tablet now. Do you want it with water or juice?" you are allowing the child to make a choice. Do not give the child the option of not taking a medication. After a medication is given, praise the child; you may even offer a simple reward such as a star or a token. Tips for administering medications to children are listed in Box 33-13.

Older Adults. Older adults also require special consideration during medication administration (Box 33-14). In addition to physiological changes of aging (Figure 33-13), behavioural and economic factors influence an older person's use of medications.

Room: 3700-03



**Saint Francis
Medical Center**

MEDICATION ADMINISTRATION RECORD

Date: 01/18/XX – 01/19/XX

ADEs/Nondrug allergies: Latex – Zosyn – Amoxicillin –
Insulins – Darvocet – Lugols soln. – Antihi +

Patient: PDM, Pharmacy
Birth: 11/30/79 Admit: 01/01/XX
MRN: 2000403 Acct: 900015
A Doctor: Jim Smith

Age: 20 y Ht: 5 ft 2 in Wt: 125.2 lbs
Metric: Ht: 1 m 57 cm Wt: 56.79 kg

[illegible]

P00014 Bacitracin ointment
AKA: Bacitracin ointment
Dose: Apply STRGH: 30 gm/tube
TID Topical: Right lower leg
For external use only
Testing

RL
70

P00029 Insulin/human regular
AKA: Humulin R Dose: 15 units
Strgh: 1 ml = 100 units AC Sub-Q

RL
0730

P00030 Fexofenadine 60 mg/psuedo 120 mg
AKA: Allegra-D Sr Tab
Dose: 1 tab STRGH: 60/120/tab
BID Oral
Auto Sub: 1 Allegra-D Tab bid
For Claritin-D 12 hr and 24 hr
Per P&T Comm

RL
10

P00036 Aspirin
AKA: Aspirin 325 mg Tab
Dose: 2 tab 650 mg STRGH: 325 mg/tab
Q3-4h Oral
Testing

RL
1315

P00039 Haloperidol tablet
AKA: Haldol 0.5 mg tab
Dose: 1 mg STRGH: 1 mg/tab
QHS Oral

P00035 Zolpidem
AKA: Ambien 5 mg tab
Dose: 5 mg STRGH: 5/tab
QHS PRN Oral
MR x 1
Testing

Circle = Dose not given

Initials = Dose given Page: 01 (continued)

Deltoid = R.D., L.D.

Vastus Lateralis = R.V.L., L.V.L.

Lower Abdominal = R.L.A., L.L.A.

Anterior Gluteal = R.A.G., L.A.G.

Posterior Gluteal = R.P.G., L.P.G.

Initials and signature <i>Rita Lassater RL</i>	Initials and signature	Initials and signature
Initials and signature	Initials and signature	Initials and signature
Initials and signature	Initials and signature	Initials and signature

Figure 33-12 Example of a medication administration record.

► BOX 33-13

Tips for Administering Medications to Children

Oral Medications

- Use liquid forms when available. They are safer for children to swallow and they help to avoid aspiration.
- Use droppers to administer liquids to infants.
- If older children have difficulty swallowing pills, suggest that they put the pill in their mouth and then sip liquid through a straw. The suction action pulls the liquid up the straw and makes it easier to swallow the pill.
- Offer juice, a soft drink, or a frozen juice bar after a medication is swallowed.
- To reduce nausea, pour carbonated beverages over finely crushed ice.
- When medications are mixed with palatable flavourings, such as syrup or applesauce, use only a small amount. Avoid mixing a medication with foods or liquids that the child enjoys because the child may in turn refuse them.
- A plastic, disposable syringe is the most accurate device for preparing liquid doses, especially doses of less than 10 mL (cups, spoons, and droppers are inaccurate.)
- When administering liquid medications, use a spoon, a plastic cup, or an oral syringe (without needle).

Injections

- Use caution when selecting IM injection sites for infants and small children. The deltoid muscle, which can be used for adults and older children, is underdeveloped and should not be used in infants and small children.
- Children can be unpredictable and uncooperative. Ensure that someone (preferably another nurse) is available to restrain a child if physical control is needed. The parent should act as a comforter, not a restrainer.
- Always awaken a sleeping child before giving him or her an injection.
- Distracting the child with conversation, a ringing bell, or a toy may reduce the child's perception of pain.
- Give the injection quickly and do not argue with the child.
- If time allows, use a eutectic mixture of local anaesthetics (EMLA) cream.

Polypharmacy. Polypharmacy occurs when the patient takes two or more medications to treat the same illness, when the patient takes two or more medications from the same chemical class, when the patient uses two or more medications with the same or similar actions to treat several disorders simultaneously, or when a patient mixes nutritional supplements or herbal products with medications (Brager & Soland, 2005; Ebersole et al., 2004). Older adults also often experience polypharmacy when they self-medicate to seek relief from a variety of symptoms (e.g., pain, constipation, insomnia, and indigestion) by using over-the-counter (OTC) preparations, traditional folk medicines, or herbal remedies. OTC medications contain many different ingredients; when used inappropriately, they can cause undesirable side effects and adverse reactions, or they may be contraindicated by the patient's condition.

Because many older adults suffer chronic health problems, polypharmacy is common. The patient who experiences polypharmacy is at an increased risk of adverse reactions and medication interactions with other medications and food.

* BOX 33-14 FOCUS ON OLDER ADULTS



- Simplify the drug therapy plan whenever possible (McKenry et al., 2006).
- Keep instructions clear and simple and provide written material in large print (Ebersole et al., 2004).
- Assess the patient's functional status to determine whether the patient requires assistance in taking medications (McKenry et al., 2006).
- Have the patient drink a little fluid before taking oral medications to ease swallowing. Encourage the patient to drink at least 150 to 180 mL of fluid after taking medications (Ebersole et al., 2004).
- Older adults may have a greater sensitivity to drugs, especially drugs that act on the central nervous system. Therefore, you need to carefully monitor patients' responses to medications and anticipate dosage adjustments as needed (Meiner & Luekenotte, 2006).
- If the patient has difficulty swallowing a capsule or tablet:
- Ask the physician to substitute a liquid medication if possible (Ebersole et al., 2004).
- Ask the patient to sit up straight and to tuck in the chin to decrease risk of aspiration (McKenry et al., 2006).
- Teach alternatives to medications, such as proper diet in place of vitamins and exercise in place of laxatives (Ebersole et al., 2004).
- On a frequent basis, review the patient's medication history, including over-the-counter medications (Meiner & Luekenotte, 2006).

Polypharmacy can be divided into two types: rational polypharmacy and irrational polypharmacy. Rational polypharmacy occurs when patients need to take several medications to treat their health conditions, which is often the case for older adults. For example, many older adults take multiple medications to lower their blood pressure. Irrational polypharmacy occurs when the patient takes more medications than needed. Irrational polypharmacy results from several causes. For example, some older adults need to see more than one health care provider to treat their different health conditions. When health care providers fail to take an accurate medication history or do not communicate with each other, the result can be patients taking many different medications, which increases their risk of polypharmacy (Brager & Soland, 2005).

Noncompliance. Noncompliance is defined as a deliberate misuse of medication, such as not taking a prescribed medication or altering the dose of a medication. In general, noncompliance occurs either because of drug ineffectiveness, uncomfortable side effects, or the prohibitive cost of the medicine.

◆ Evaluation

Nurses monitor patient responses to medications on an ongoing basis. For each medication, you require knowledge of the desired effect, the therapeutic action, and the common side effects. A change in a patient's condition can be physiologically related to health status, medications, or both. Be alert for reactions in a patient who takes several medications. To achieve the goal of safe and effective medication administration, a

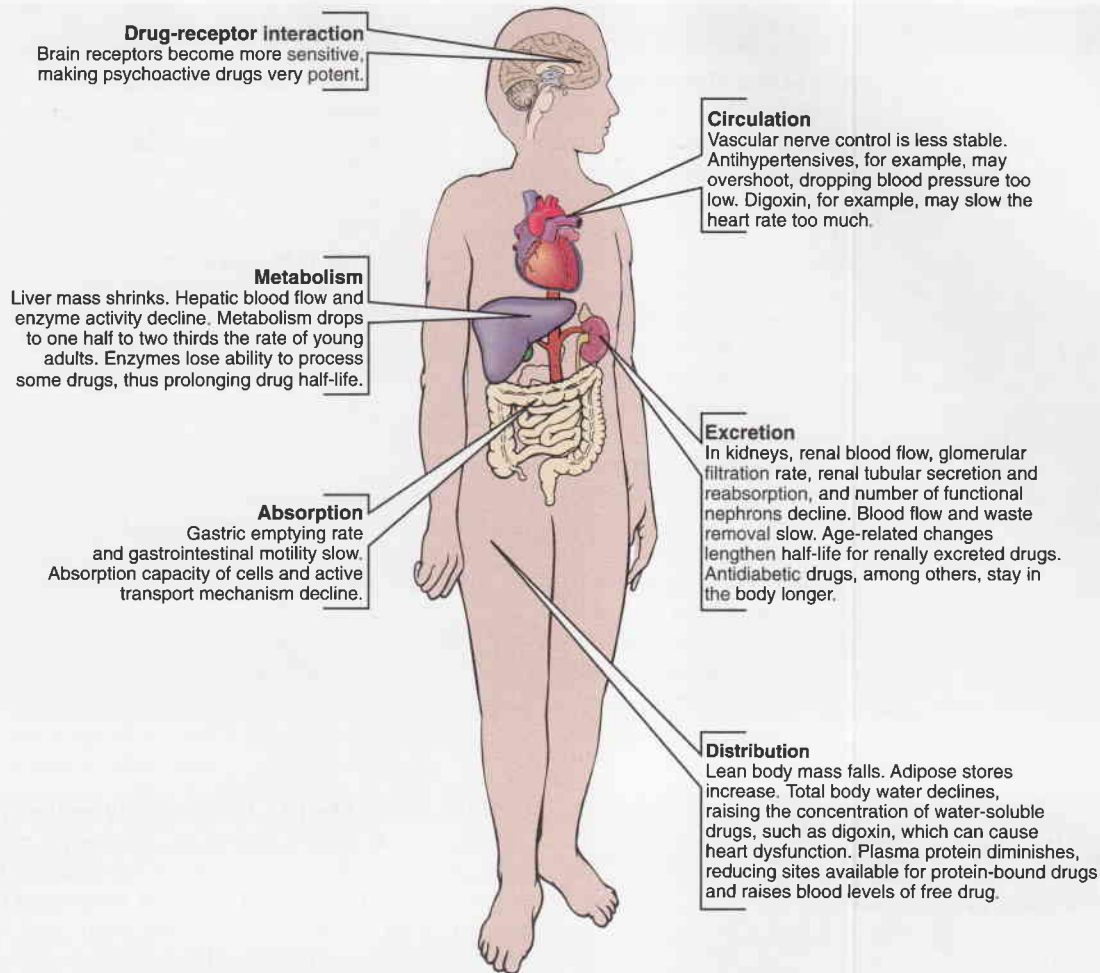


Figure 33-13 The aging body and drug use. **Source:** From Lewis, S. M., Dirksen, S. R., Heitkemper, M. M., Bucher, L. L., & Camera, I. M. (Eds.). (2011). *Medical-surgical nursing: Assessment and management of clinical problems* (8th ed., p. 76; Fig. 5-10). St Louis, MO: Mosby.

careful evaluation of both the patient's response to therapy and the patient's ability to assume responsibility for self-care is required.

To evaluate the effectiveness of nursing interventions in meeting established goals of care, use evaluative measures to identify whether patient outcomes were met. Apply various evaluation measures in the context of medication administration, including direct observation of the patient's behaviour or response, rating scales and checklists, and oral questioning. Physiological measurement is the most common method of evaluation. Examples of physiological measures are blood pressure, heart rate, and visual acuity. Patient statements can also be used as evaluative measures. Table 33-9 gives examples of goals, expected outcomes, and corresponding evaluative measures.

Medication Administration

Medication administration is an essential part of nursing practice and requires a sound knowledge base in anatomy, physiology, pathophysiology, pharmacology, psychology, and research. The following sections illustrate the steps involved in administering medications through various routes.

Oral Administration

The easiest and most desirable way to administer medications is by mouth (Skill 33-1). Patients usually are able to ingest or self-administer oral medications with few problems. Most tablets and capsules should be administered and swallowed with approximately 60 to 100 mL of fluid (as allowed). Some situations contraindicate administering medications by mouth.

The primary contraindications to giving oral medications include the presence of gastrointestinal (GI) alterations, the inability of the patient to swallow food or fluids, and the use of gastric suction. An important precaution to take when administering any oral preparation is to protect patients from aspiration. Aspiration occurs when food, fluid, or medication intended for GI administration is inadvertently administered into the respiratory tract. Protect the patient from aspiration by assessing the patient's ability to manage oral medications. Box 33-15 describes techniques you can use to protect the patient from aspirating. Properly positioning the patient is also essential in preventing aspiration. Position the patient in a seated position when administering oral medications, if such a position is not contraindicated by the patient's condition. Having the patient slightly flex the head in a chin-down position usually reduces aspiration (Metheny, 2006). Use a

► **TABLE 33-9** Example Evaluation for Patient Goals**Goals**

The patient and the patient's family understand the patient's medication therapy.

The patient safely self-administers medications.

Expected Outcomes

The patient and the patient's family describe information about the medication, its dosage, schedule, purpose, and adverse effects.

The patient and the patient's family identify situations that require medical intervention.

The patient and the patient's family demonstrate the appropriate administration technique.

The patient follows a prescribed treatment regimen.

The patient performs administration techniques correctly.

The patient identifies available resources for obtaining the necessary medication.

Expected Outcomes

Written measurement: Ask the patient to write out the medication schedule for a 24-hour period.

Oral questioning: Ask the patient to describe the purpose, dosage, and adverse effects of each prescribed medication.

Oral questioning: Ask the patient's family to describe what to do if the patient has adverse effects from a medication.

Direct observation: Ask the patient to demonstrate the filling of an insulin syringe and self-injection.

Anecdotal notes: Have the patient's family keep a log of the patient's compliance with therapy for 1 week.

Direct observation: Observe while the patient instills eye drops.

Oral questioning: Ask the patient's family to identify how to contact the local pharmacy or community clinic to obtain the patient's medications.

► **BOX 33-15** Protecting the Patient From Aspiration

- Determine the patient's ability to swallow.
- Assess the patient's cough.
- Determine the presence of a gag reflex.
- Prepare oral medications in the form that is easiest for the patient to swallow.
- Allow the patient to self-administer medications if possible.
- If the patient has unilateral weakness, place the medication in the stronger side of the mouth.
- Administer pills one at a time, ensuring that each pill is properly swallowed before the next one is introduced.
- Thicken regular liquids or offer fruit nectars if the patient cannot tolerate thin liquids.
- Have the patient hold and drink from a cup if possible.
- When possible, medications should be timed to coincide with mealtimes or when the patient is well rested and awake.
- Administer medications through another route if risk of aspiration is severe.

multidisciplinary approach (e.g., consult with a speech therapist, a dietitian, and an occupational therapist) with patients who have difficulty swallowing (Morris, 2006).

For patients with nasogastric feeding tubes, liquid medications are preferred, but some tablets can be crushed and some capsules can be opened to mix in a solution for administration (Box 33-16).

Topical Medication Applications

Topical medications are medications that are applied locally, most often to intact skin but also to mucous membranes. They are prepared in many forms, including lotions, pastes, and ointments (see Table 33-1).

Skin Applications. Because many locally applied medications, such as lotions, pastes, and ointments, cause both systemic and local effects, apply these medications with the use of gloves and applicators. Use sterile techniques if the patient has an open wound. Skin encrustation and dead tissues harbour microorganisms and block contact of the medications from the tissues to be treated. Before applying medications, clean the area to be treated thoroughly by washing the skin gently with soap and water, soaking an involved site, or locally debriding tissue (see Chapter 46).

Apply each type of topical medication according to the directions to ensure proper penetration and absorption. When applying ointments or pastes, spread the medication evenly over the involved surface and cover the area well without applying an overly thick layer. Prescribers may order a gauze dressing to be applied over the medication to prevent soiling of clothes and wiping away of the medication. Lightly spread lotions and creams onto the skin's surface; rubbing often causes irritation. Apply a liniment by rubbing it gently but firmly into the skin. After that, dust a powder lightly to cover the affected area with a thin layer. During any application, assess the skin thoroughly. When you record the administration, note the area where the medication was applied, the name of the medication, and the condition of the skin.

Some topical medications are applied in the form of a transdermal patch that remains in place for an extended period of time (e.g., 12 hours or 7 days). Many patches are clear, which makes them difficult to see. Nurses and patients may inadvertently leave old transdermal patches in place, which results in the patient receiving an overdose of the medication. Therefore, carefully assess the patient's skin and ensure that you remove the existing patch before applying a new patch. The following guidelines are used to ensure safe administration of transdermal or topical medications (Institute for Safe Medication Practices, 2007):

Text continued on p. 697

► SKILL 33-1 Administering Oral Medications**Delegation Considerations**

The administration of oral medications cannot be delegated to unregulated care providers (UCPs). Instruct UCPs to report the occurrence of medication side effects immediately.

Equipment

- Medication cart or tray
- Disposable medication cups
- Patient identification labels
- Glass of water, juice, or preferred liquid
- Drinking straw
- Pill-crushing device (optional)
- Medication administration record or computer printout

Procedure**STEPS**

1. Check the accuracy and completeness of each medication administration record (MAR) or computer printout against the prescriber's original medication order. Check the patient's name and the medication name, dosage, route, and time for administration. Copy or rewrite any portion of the MAR that is difficult to read.
2. Assess the patient for any contraindications to receiving oral medication: Is the patient experiencing nausea or vomiting? Has the patient received a diagnosis of bowel inflammation or reduced peristalsis? Has patient undergone recent gastrointestinal (GI) surgery? Does patient have gastric suction? Is the patient restricted to nothing by mouth (NPO)? Check the patient's reflexes for swallowing, coughing, and gagging.
3. Assess the patient's medical history, history of allergies, medication history, and diet history. List the patient's food and drug allergies on each page of the MAR and prominently display the allergies on the patient's medical record. This information may also be added to an identification bracelet.
4. Gather information from the patient's physical examination and laboratory data that may influence medication administration (e.g., vital signs, blood glucose levels, electrolyte levels, laboratory findings related to blood clotting times and to renal and liver function).

RATIONALE

- The order sheet is the most reliable source and only legal record of medications the patient is to receive. Adherence to the order ensures the patient receives the correct medications. Illegible MARs are a source of medication errors.
- Alterations in GI function interfere with a medication's ability to be distributed, absorbed, and excreted. Patients with GI suction might not receive benefit from medications because they are suctioned from the GI tract before they can be absorbed. Patients with impaired swallowing are at risk for aspiration (Metheny, 2006).
- The information reflects the patient's need for medications and the potential responses to medications. Communication of the patient's potential food and drug interactions and allergies is essential for safe, effective care.
- Physical examination or laboratory data may contraindicate medication administration. Poor liver and kidney functions affect the metabolism and excretion of medications (McKenry et al., 2006).

Critical Decision Point: If the patient has any contraindications for receiving oral medications, or if you are in doubt of the patient's ability to swallow oral medications, temporarily withhold medication and inform the prescriber.

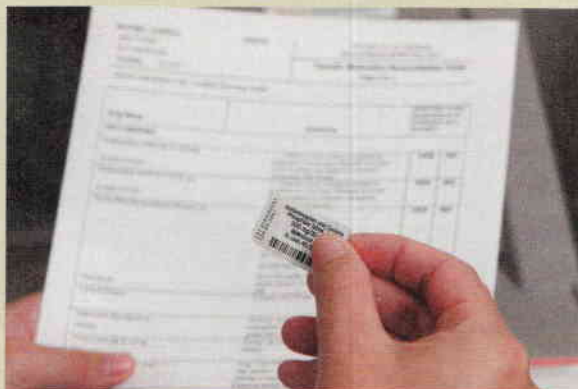
5. Assess the patient's knowledge regarding health and medication use.
 - This assessment helps to determine the patient's need for medication education and whether the patient adheres to medication therapy at home. The assessment may reveal difficulties with medication use problems, such as medication intolerance, noncompliance, abuse, addiction, or dependence.
6. Assess the patient's preferences for fluids. Maintain fluid restriction when applicable.
 - Offering fluids during medication administration increases the patient's fluid intake. Fluids ease swallowing and facilitate absorption from the GI tract. Fluid restrictions must be maintained when applicable.
7. Prepare medications:
 - A. Perform hand hygiene.
 - B. If a medication cart is used, move it to a location outside the patient's room.
 - C. Unlock the medicine drawer or cart or log on to the automated medication dispensing system.
 - D. Prepare medication for one patient at a time. If you are using paper copies of the MAR, keep all pages for one patient together. If you are using the patient's medication administration on the computer, view only one computer screen at a time.
 - Proper hygiene reduces the transfer of microorganisms.
 - Organization of equipment saves time and reduces the chance for error.
 - Medications are safeguarded when locked in cabinet or cart. Storage in a locked area prevents preparation error.
 - Preventing distractions limits preparation errors (Pape et al., 2005).

Continued

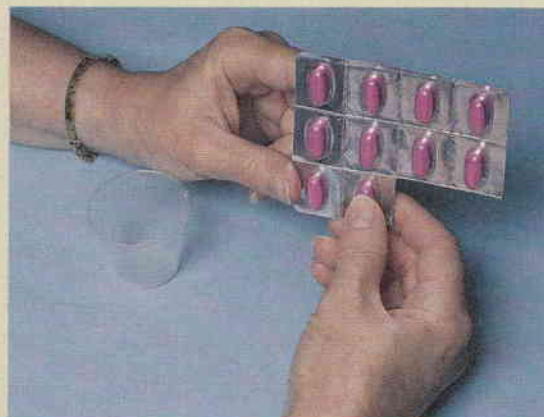
SKILL 33-1 Administering Oral Medications—cont'd



- E. Select the correct medication from a stock supply or a unit-dose drawer. Compare the label on the medication with the MAR (see Step 7E illustration) or the computer screen. Check the expiration date on all medication labels.
 - F. Calculate the medication dose as necessary. Double-check all calculations, and verify your calculations with another nurse.
 - G. If you are preparing a controlled substance, check the patient's MAR or computer record to determine the last time the medication was administered. Check the record for the previous medication count and compare the current count with the supply available.
 - H. To prepare tablets or capsules from a floor stock bottle, pour the required number into the bottle cap and transfer the medication to a medication cap. Do not touch the medication with your fingers. Return extra tablets or capsules to the bottle. Break scored medications. If necessary, use a clean pillating device. Identify scored tablets by looking for a line that divides the tablet in half.
 - I. To prepare unit-dose tablets or capsules, place the packaged tablet or capsule directly into a medicine cup. Do not remove the wrapper (see Step 7I illustration.)
- Comparing the labels on the medication with the transcribed orders reduces the chance for error. *This is the first accuracy check.*
 - Double-checking reduces the risk of error.
 - Checking the medication count reduces the risk of double-dosing if the patient is receiving controlled substances on a "prn" schedule.
 - Controlled substance laws require nurses to carefully monitor and count any dispensed narcotics.
 - A clean technique is required of medication administration. Cleaning the pillating (or pill-cutting) device ensures prior medications are cleaned out of the device and cannot contaminate this tablet. To ensure that you give the accurate dose to patient, split only those tablets that are scored.
 - Wrappers maintain the cleanliness of medications and allow the nurse to identify the medication name and dose at the patient's bedside.



Step 7E The nurse verifies each medication with the MAR.



Step 7I Place tablet into medicine cup without removing wrapper.

Critical Decision Point: If you are preparing narcotics, check the narcotic record for the previous drug count and compare it against the supply available. You are responsible for being aware of and upholding laws regarding the use of controlled substance.

- J. Place all tablets or capsules to be given to patient in one medicine cup, with the patient's identification label attached, except for those medications that require preadministration assessments (e.g., pulse rate or blood pressure); keep medications in their wrappers. After medication administration, remove the patient's identification label and discard the label in the appropriate confidential waste disposal receptacle.
- Labelling the patient's medication cup reduces the risk of administering medications to the incorrect patient.
- Keeping medications that require preadministration assessments separate from other medications makes it easier for the nurse to withhold medications as necessary.
- Disposing of the patient's label in confidential waste receptacles is necessary to protect patient confidentiality.

Critical Decision Point: Not all medications can be crushed (e.g., capsules and enteric-coated drugs). When in doubt whether a medication can be crushed, consult with your pharmacist. When pills are crushed, the patient is more likely to experience choking or aspiration of particles of medication or soft food.

► SKILL 33-1 Administering Oral Medications—cont'd



K. If the patient has difficulty swallowing, and liquid medications are not an option, use a pill-crushing device, such as a mortar and pestle to grind the pills (see Step 7K illustration). Before using a mortar and pestle, clean them. If a pill-crushing device is not available, place the tablet inside a medication cup, place another medication cup on top of it, and press on the top cup with a blunt instrument until the pill is crushed. Mix the ground tablet in small amount of soft food (custard or applesauce).



Step 7K Pill-crushing device used to crush pills when necessary.

L. To prepare liquids:

- (1) Gently shake the container. If the medication is in a unit-dose container with the correct amount to administer, no further preparation is needed. If the medication is in a multidose bottle, remove the bottle cap from the container and place the cap so that the inside of the cap is not exposed.
- (2) Hold a multidose bottle with the label against the palm of your hand while pouring.
- (3) Hold the medication cup at eye level and fill to the desired level on the scale (see Step 7L[3] illustration). The scale should be even with the fluid level at its surface or the base of the meniscus, not at its edges. Draw up volumes of less than 10 mL in a syringe without a needle (see Step 7L[3] illustration).

- Large tablets can be difficult to swallow. A ground tablet mixed with palatable soft food is usually easier to swallow. Cleaning pill-crushing devices ensures that contamination of medications does not occur.

- Shaking the container ensures the medication is mixed before administration. Correct placement of the cap of the bottle avoids contamination.
- Hold the bottle so that any spilled liquid will not soil or fade the label.
- Filling medication properly ensures accuracy of measurement. The use of a syringe enables greater accuracy for small doses of medication.



A



B

Step 7L (3) A, Pour the desired volume of liquid so that the base of the meniscus is level with the line on the scale. B, Use a needleless syringe to draw up volumes of less than 10 mL.

- (4) Discard any excess liquid into a sink. Wipe the lip and neck of the multidose bottle with a paper towel.

- These steps prevent contamination of the bottle's contents and prevent the bottle cap from sticking to the counter.
- Avoids unnecessary manipulation of the dose.

Continued

► SKILL 33-1 Administering Oral Medications—cont'd



- M. Compare the MAR, computer printout, or computer screen with the prepared medication and container.
 - N. Return stock containers or unused unit-dose medications to the storage shelf or drawer and read the labels again.
 - O. Do not leave medications unattended.
8. Administering medications:
- A. Take medications to the patient at the correct time.
 - B. Identify the patient by using at least two patient identifiers. Compare the patient's name and one other identifier (e.g., the hospital identification number) on the MAR, computer printout, or computer screen with information on the patient's identification bracelet. Ask the patient to state his or her name if possible, for a third identifier.
 - C. Compare labels of the medications with the MAR at the patient's bedside.
 - D. Explain to the patient the purpose of each medication and its action.
Encourage the patient to ask any questions about the drugs.
 - E. Assist the patient to a sitting position (or side-lying position if sitting is contraindicated).
 - F. Administer medications:
 - (1) *For tablets:* The patient may wish to hold solid medications in the hand or in a cup before placing them in the mouth.
 - (2) Offer water or juice to help the patient swallow the medications. Give cold carbonated water if it is available and not contraindicated.
 - (3) *For sublingual-administered medications:* Have the patient place the medication under the tongue and allow it to dissolve completely (see Figure 33-4). Caution the patient against swallowing the tablet.
 - (4) *For buccal medications:* Have the patient place the medication in the mouth against the mucous membranes of the cheek until it dissolves (see Figure 33-5). Avoid administering liquids until the buccal medication has dissolved.
 - (5) *For powdered medications:* Mix with liquids at bedside and give to the patient to drink.
 - (6) Caution the patient against chewing or swallowing lozenges.
 - (7) Give effervescent powders and tablets immediately after they have dissolved.
 - G. If the patient is unable to hold medications in the hand or in a cup, place the medication cup to the patient's lips and gently introduce each drug into the mouth, one at a time. Do not rush.
 - H. If a tablet or capsule falls to the floor, discard it and repeat the preparation.
 - I. Stay at the bedside until the patient has completely swallowed each medication. If you are uncertain whether the medication was swallowed, ask the patient to open the mouth.
- Reading labels a second time reduces the chance for error. *This is the second accuracy check.*
 - The *third accuracy check* of medication labels in multiple-dose containers further reduces administration errors.
 - Nurses are responsible for the safekeeping of drugs.
 - Medications are administered within 30 minutes before or after the prescribed time to ensure the intended therapeutic effect. Give STAT medications immediately or single-order medications at the time they are ordered.
 - These steps comply with the Joint Commission's (2007) requirements and improve medication safety. In most acute care settings, the patient's name and identification number on an armband and the MAR is used to identify patients. Identification bracelets are made at the time of the patient's admission and are the most reliable source of identification. The patient's room number is not an acceptable identifier.
 - Perform a final check of medication labels against the MAR at the patient's bedside to reduce medication administration errors.
 - The patient has the right to be informed; questions often indicate the need for teaching and reveal noncompliance with therapy or potential medication errors. A patient's understanding of the purpose of each medication improves compliance with medication therapy.
 - A sitting position prevents aspiration during swallowing (Metheny, 2006).
 - The patient can become familiar with medications by seeing each drug.
 - Offering a choice of fluids promotes the patient's comfort and can improve fluid intake. Carbonated water helps passage of the tablet through the esophagus.
 - Medication is absorbed through the blood vessels of the undersurface of the tongue. If medication is swallowed, it is destroyed by gastric juices or detoxified by the liver so rapidly that therapeutic blood levels are not attained.
 - Buccal medications act locally on mucosa or systemically as they are swallowed in saliva.
 - When prepared in advance, powdered medications may thicken and even harden, which makes swallowing difficult.
 - Medication acts through slow absorption through oral mucosa, not gastric mucosa.
 - Effervescence improves the unpleasant taste of the medication and often relieves GI problems.
 - Administering a single tablet or capsule eases swallowing and decreases the risk of aspiration.
 - Medication is contaminated when it touches floor.
 - You are responsible for ensuring the patient receives the ordered dose. If left unattended, the patient may not take the dose or may save medications, which could cause a risk to health.

Critical Decision Point: Replace patient identification bracelets that are missing, illegible, or faded.

► SKILL 33-1 Administering Oral Medications—cont'd



- J. For highly acidic medications (e.g., aspirin), offer the patient a nonfat snack (e.g., crackers) if it is not contraindicated by the patient's condition.
- K. Assist the patient in returning to a comfortable position.
- L. Replenish the stock, such as cups and straws. If a medication cart was used, return the cart to the medication room. Clean the work area.
- 9. Evaluate the patient's response to medications at times that correlate with the medication's onset, peak, and duration.
- 10. Ask the patient or the patient's family member to identify the medication name and explain the purpose, action, dosage schedule, and potential side effects of the drug.
- A nonfat snack reduces the possible gastric irritation from highly acidic medication.
- The patient's comfort is maintained.
- A clean and organized work space helps other staff to complete their duties efficiently.
- You can evaluate the medication's therapeutic benefit and detect the onset of side effects or allergic reactions.
- You can determine the level of knowledge gained by the patient and the patient's family.

Unexpected Outcomes

Adverse effects (e.g., side effects, toxic effects, allergic reactions)

Patient refuses medication

Related Interventions

- Symptoms such as urticaria, rash, pruritus, rhinitis, and wheezing may indicate an allergic reaction.
- Withhold further doses, and add allergy information to the patient's health record
- Always notify the prescriber and the pharmacy when the patient exhibits adverse effects.
- Explore reasons why the patient does not want the medication.
- If misunderstandings of the medication therapy are apparent, address the misconceptions by educating the patient.
- Do not force the patient to take the medication; patients have the right to refuse treatment.
- If the patient continues to refuse medication despite your attempts to educate, record on patient's chart why the drug was withheld and notify the prescriber.

Recording and Reporting

- Record the administration of oral medications on the computerized or paper copy of the medication administration record immediately after administering the medications. If you are using a paper copy of the medication administration record, include your initials or signature.
- Record the reason any drug was withheld and follow the agency's policy for proper recording.
- Record and report your evaluation of the medication's effect to the prescriber if required (e.g., report urine output following administration of a diuretic if ordered by the prescriber).

Home Care Considerations

- To ensure safe medication administration at home, instruct patients on all aspects of medication administration, including dosage, desired effect, when to take the medications, proper storage of the medications, anticipated side effects, and whether to take medication with or without food.
- Evaluate the patient's ability to safely self-administer medications. If the patient needs assistance in self-administration, introduce nursing interventions, such as a chart or pillbox. If interventions fail and the patient still is unable to safely administer medications, notify the prescriber.

1. Document on the medication administration record or computer record the area where the medication was applied.
2. When applying a transdermal patch, ask the patient whether he or she has an existing patch.
3. Do not assume that a patch has fallen off or has already been removed. Assess the skin thoroughly before administering the medication.
4. When taking a medication history or reconciling medications, specifically ask the patient whether he or she takes any medications in the form of patches, topical creams, or any route other than the oral route.
5. If the dressing or patch is difficult to see (e.g., it is clear), apply a noticeable label to the patch.
6. Document removal of the patch or medication on the medication administration record or computer record.

Nasal Instillation. Patients with nasal sinus alterations may receive medications by spray, drops, or tampons (Box

33-17). The most commonly administered form of nasal **instillation** (administration of a liquid) is a decongestant spray or drops, which are used to relieve symptoms of sinus congestion and colds. Caution patients to avoid abuse of medications because overuse can lead to a rebound effect in which the nasal congestion worsens. When excess decongestant solution is swallowed, serious systemic effects can develop, especially in children. Saline drops are safer as a decongestant for children than nasal preparations that contain sympathomimetics (e.g., Afrin or Neo-Synephrine).

Self-administering sprays is easier because the patient can control the spray and inhale as it enters the nasal passages. For patients who use nasal sprays repeatedly, check the nares for irritation. Position patients to permit the medication to reach the affected sinus.

Eye Instillation. Common eye medications used by patients are eye drops and ointments, including OTC

► BOX 33-16 Procedural Guideline

Giving Medications Through a Nasogastric Tube, Intestinal Tube, Gastrostomy Tube, or Small-Bore Feeding Tube

Delegation Considerations:

The administration of medications through a nasogastric tube, intestinal tube, gastrostomy tube, or smallbore feeding tube cannot be delegated. Instruct unregulated care providers to report the occurrence of side effects immediately.

Equipment:

- 60 mL syringe (catheter tip for large-bore tubes, Luer-Lok tip for small-bore tubes)
- Gastric pH test strips (scale of 0.0 to 11.0 or 14.0 preferred)
- Graduated container
- Water
- Medication to be administered
- Pill crusher, if medication is in tablet form
- Medication administration record
- Clean gloves

Procedure:

1. Check the accuracy and completeness of each medication administration record against the prescriber's written medication order.
- Check the patient's name, the drug name and dosage, and the route and time of administration.
2. Investigate and, if possible, use alternative routes of medication administration (e.g., intravenous, transdermal, rectal).
3. Avoid complicated medication regimens that frequently interrupt enteral feedings.
4. Prepare medication (see Skill 33-1, Steps 7A–G and M–O). Check the label of the medication with the medication administration record three times.
5. Avoid giving elixirs or medications that have a pH of less than 4.
6. Never add medications directly to a feeding tube. Before administering a medication, determine if it needs to be given on an empty stomach or if it is compatible with the enteral feeding. The amount of time the enteral feeding needs to be held before administration varies with the medication. Verify the amount of the time that you hold a feeding with agency policy or with a pharmacist.
7. Verify tube placement before administering medications (see Chapter 42).
8. Administer medications in a liquid form (suspension, elixir, or solution) when possible to prevent tube obstruction.

9. Before crushing tablets, ensure they are crushable. Buccal, sublingual, enteric-coated, or sustained-release medications cannot be crushed. Read medication labels carefully before crushing a tablet or opening a capsule.
10. Take medications to the patient at the correct time and perform hand hygiene.
11. Identify the patient by using at least two patient identifiers. Compare the patient's name and one other identifier (e.g., the hospital identification number) on the identification bracelet with the medication administration record. Ask the patient to state his or her name if possible, for a third identifier.
12. Compare the labels on the medications against the medication administration record one more time at the patient's bedside.
13. Explain the procedure and the medications to the patient.
14. Dissolve crushed tablets, gelatin capsules, and powders in 15 to 30 mL of warm water. Dissolve each medication separately.
15. Do not give whole or undissolved medications through the feeding tube.
16. Put on clean, disposable gloves.
17. Verify the placement of any tube that enters the mouth or nose by using pH testing (see Chapter 42).
18. Assess gastric residual (see Chapter 42).
19. Draw up medication in syringe. Do not mix medications together.
20. Connect the syringe with medication to a nasogastric tube, G-tube, J-tube, or small-bore feeding tube. Do not use the pigtail vent for irrigation or instillation of fluid.
21. Administer medication either by pushing the medication through the tube by depressing the plunger of the syringe or by allowing the medication to flow into the body freely by using gravity. Administer each medication separately.
22. Flush the tube with 15 to 30 mL of warm water between each medication. Unless contraindicated, the total amount of liquid volume administered to the patient is approximately 60 mL.
23. After giving all the medications, flush the tube once more with 30 to 60 mL of warm water.
24. Remove gloves and perform hand hygiene.
25. Document administration of medications on the medication administration record.
26. Continually evaluate the patient's response to medication therapy. If the desired effect is not achieved, a different medication or a different route of administration may be indicated because of problems with the drug bioavailability when given by the enteral route.

Adapted from Jordan, S., Griffiths, H., & Griffin, R. (2003). Administration of medicines. II. Pharmacology. *Nursing Standard*, 18(3), 45–55.

preparations, such as artificial tears and vasoconstrictors (e.g., Visine and Murine). Many patients receive prescribed **ophthalmic** medications for eye conditions, such as glaucoma, and after cataract extraction. In older adults, the ease with which eye medications can be self-administered can be affected by gerontological changes, including poor vision, hand tremors, and difficulty grasping or manipulating containers. Instruct patients and their family members about the proper techniques for administering eye medications (Skill 33-2). Determine the ability of the patient and the patient's family members to administer the eye medication by demonstrating the procedure. Showing patients each step of the procedure for instilling

eye drops can improve their compliance. Follow these principles when administering eye medications:

- The cornea of the eye is richly supplied with pain fibres and thus is very sensitive to anything applied to it. Avoid instilling any form of eye medication directly onto the cornea.
- The risk of transmitting infection from one eye to the other is high. Avoid touching the eyelids or other eye structures with eyedroppers or ointment tubes.
- Use eye medication only for the patient's affected eye.
- Never allow a patient to use another patient's eye medications.

Text continued on p. 704

► BOX 33-17 Procedural Guideline

Administering Nasal Instillations

Delegation Considerations:

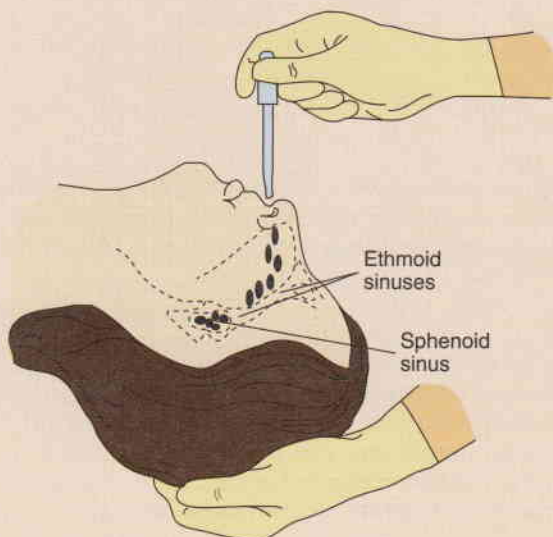
The administration of nasal drops and ointments cannot be delegated. Instruct unregulated care providers to report the occurrence of medication side effects immediately.

Equipment:

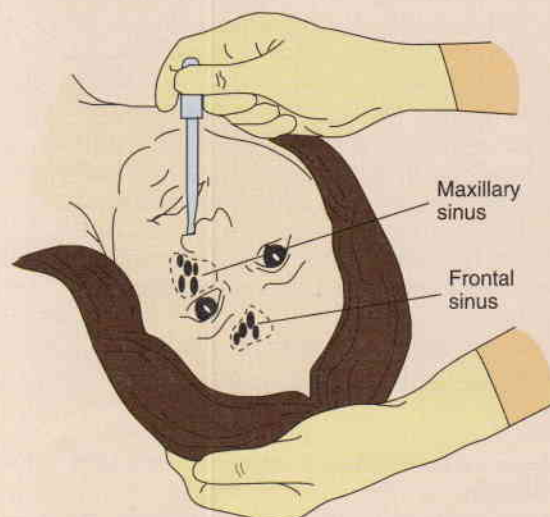
- Prepared medication with a clean dropper or spray container
- Facial tissue
- Small pillow (optional)
- Washcloth (optional)
- Clean, disposable gloves (if patient has extensive nasal drainage)
- Medication administration record
- Penlight (to inspect nares; if ointment is to be applied to a specific lesion inside the nares)

Procedure:

1. Check the accuracy and completeness of each medication administration record (MAR) or computer printout against the prescriber's original medication order. Check the patient's name and the medication name, dosage, route, and time for administration. Copy or rewrite any portion of the MAR that is difficult to read.
2. If nasal drops are to be administered, refer to the medical record to determine which sinus is affected, so that you can position the patient appropriately for drug instillation.
3. Assess the patient's medical history (e.g., cardiovascular disease, hyperthyroidism). Medical conditions can contraindicate the use of decongestants that stimulate the central nervous system. Side effects may occur, such as transient hypertension, tachycardia, palpitations, and headache.
4. List the patient's food and drug allergies on each page of the MAR and prominently display the allergies on the patient's medical record as per agency policy. Determine whether the patient has any allergies to medications delivered via nasal instillation.
5. Review the physician's order, including the patient's name and the medication name, dosage, route, time of administration, and indication.
6. Take the medication to the patient at the correct time and perform hand hygiene. Using a penlight, inspect the condition of the nose and sinuses. Palpate sinuses for tenderness.
7. Assess the patient's knowledge regarding the use of nasal instillations and the technique for instillation, and determine whether the patient is willing to learn self-administration.
8. Prepare the medication (see Skill 33-1, Steps 7A–G, M–O). Ensure you compare the label of the medication against the MAR at least two times while preparing the medications.
9. Identify the patient by using at least two identifiers. Compare the patient's name and one other identifier (e.g., the hospital identification number) on the MAR, computer printout, or computer screen with information on the patient's identification bracelet. Ask the patient to state his or her name if possible, for a third identifier.
10. Compare the MAR with the medication labels at the patient's bedside.
11. Explain the procedure to the patient regarding the positioning and the sensations to expect, such as a burning or stinging of the mucosa, or a choking sensation as the medication trickles into the throat.
12. Arrange the supplies and medications at the bedside. Put on gloves if the patient has nasal drainage.
13. Gently roll or shake the medication container.
14. Instruct the patient to clear or blow the nose gently unless contraindicated (e.g., risk of increased intracranial pressure or nosebleeds). Clearing the nose helps to remove mucus and secretions that can block medication distribution.
15. Administer nasal drops:
 - A. Assist the patient to a supine position and position the head properly to facilitate access to the nasal passages.
 - (1) To access the posterior pharynx, tilt the patient's head backward.
 - (2) To access the ethmoid and sphenoid sinuses, tilt the head back over the edge of the bed or place a small pillow under the patient's shoulder and tilt the head back (see Step 15A[2] illustration).
 - (3) To access the frontal and maxillary sinuses, tilt the head back over the edge of the bed or pillow with the head turned toward the side to be treated (see Step 15A[3] illustration). This position will allow the medication to drain into the affected sinus.



Step 15A (2) Position for instilling nose drops into the ethmoid and sphenoid sinuses.



Step 15A (3) Position for instilling nose drops into the frontal and maxillary sinuses.

Continued

► BOX 33-17 Procedural Guideline—cont'd

- B. Support the patient's head with your nondominant hand to prevent the straining of neck muscles.
- C. Instruct the patient to breathe through the mouth, which reduces the chance of aspirating nasal drops into the trachea and lungs.
- D. Hold the dropper 1 cm above the nares to avoid contamination of the dropper. Instill the prescribed number of drops toward midline of the ethmoid bone to facilitate distribution of medication over the nasal mucosa.
- E. Have the patient remain in a supine position for five minutes to prevent premature loss of medication through the nares.
- F. Offer a facial tissue to blot a runny nose, but caution the patient against blowing the nose for several minutes.
16. Assist the patient to a comfortable position after the medication is absorbed.
17. Administering nasal spray:
 - A. Assist the patient to a comfortable high Fowler's position or a sitting position.
 - B. Administer the nasal spray with the patient's head upright. Tipping the opening of the nasal spray container downward will cause the medication to be administered in a stream, not a spray, and will deliver more medication than the prescribed order.
 - C. Offer a facial tissue to blot a runny nose, but caution the patient against blowing the nose for several minutes.
18. Dispose of soiled supplies in the proper container and perform hand hygiene.
19. Document administration of medication on the MAR or in the computer.
20. Observe the patient for the onset of side effects 15 to 30 minutes after administration. Drugs absorbed through mucosa can cause a systemic reaction.
21. Ask whether the patient is able to breathe through the nose after decongestant administration to determine the drug's effectiveness. Sometimes the patient will need to occlude one nostril at a time and breathe deeply.
22. Evaluate the patient's response to the medications at times that correlate with the medication's onset, peak, and duration. Evaluate the patient for both desired effects and adverse effects. Reinspect the condition of the nasal passages between the instillations.
23. Ask the patient to review the risks of overuse of decongestants and methods for administration.
24. Have the patient demonstrate self-medication.

► SKILL 33-2 Administering Ophthalmic Medications



Delegation Considerations

The administration of eye drops and ointments cannot be delegated. Instruct unregulated care providers to report the occurrence of medication side effects, including the potential for visual difficulty, immediately.

Equipment

- Medication bottle with sterile eyedropper, ointment tube, or medicated intraocular disc
- Cotton ball or tissue
- Washbasin filled with warm water and washcloth if eyes have crust or need drainage
- Eye patch and tape (optional)
- Clean gloves
- Medication administration record (MAR) or computer printout

Procedure

STEPS

1. Check the accuracy and completeness of each MAR or computer printout against the prescriber's medication order. Check the patient's name, the medication name and dosage (e.g., number of drops, if a liquid), the eye to be treated (e.g., right, left, or both eyes), and the route and time of administration. Copy or rewrite any portion of the MAR that is difficult to read.
2. Assess the condition of the patient's external eye structures. (This may also be assessed just before drug instillation.)
3. Determine whether the patient has any known allergies to eye medications. Also ask whether the patient has an allergy to latex.
4. Determine whether the patient has any symptoms of visual alterations.
5. Assess the patient's level of consciousness and ability to follow directions.
6. Assess the patient's knowledge regarding medication therapy and the desire to self-administer medication.
7. Assess the patient's ability to manipulate and hold an eye dropper.

RATIONALE

- This assessment provides a baseline to help determine whether the medication causes a local response. The assessment also indicates the need to clean the eye before medication application.
- Certain eye medications act to either decrease or increase these symptoms. Determining the patient's visual alteration status ensures that you are able to recognize a change in patient's condition after the medication is administered.
- A patient who becomes restless or combative during the procedure is at a greater risk of accidental eye injury.

► SKILL 33-2 Administering Ophthalmic Medications—cont'd

8. Prepare medication (see Skill 33-1, Steps 7A–G and M–O): Ensure that you check the label of the medication against the MAR at least two times while preparing the medication.
 9. Take the medication to the patient at the correct time and perform hand hygiene.
 10. Identify the patient by using at least two patient identifiers. Compare the patient's name and one other identifier (e.g., the hospital identification number) on the MAR, computer printout, or computer screen with information on patient's identification bracelet. Ask the patient to state his or her name if possible, for a third identifier.
 11. Compare labels of medications with the MAR or computer printout at the patient's bedside.
 12. Arrange the medication supplies at the bedside and put on clean gloves. If eye drops are stored in the refrigerator, allow them to reach room temperature before instilling them.
 13. Gently roll the container.
 14. Explain the procedure to the patient, including the positioning and sensations to expect, such as burning or stinging.
 15. Ask the patient to lie supine or to sit back in a chair with the head slightly hyperextended.
 16. If crusts or drainage are present along the eyelid margins or the inner canthus, gently wash them away. Soak any crusts that are dried and difficult to remove by applying a damp washcloth or cotton ball over the eye for a few minutes. Always wipe from the inner canthus to the outer canthus.
 17. Hold a cotton ball or clean tissue in your nondominant hand.
 18. With the tissue or cotton resting below the lower lid, gently press downward with your thumb or forefinger against the bony orbit.
 19. Ask the patient to look at the ceiling and explain the steps to the patient.
 - A. Instill the eye drops:
 - (1) With your dominant hand resting on the patient's forehead, hold the filled medication eyedropper or the ophthalmic solution approximately 1–2 cm above the conjunctival sac (see Step 19A[1] illustration).
 - (2) Instill the prescribed number of medication drops into the conjunctival sac.
 - (3) If the patient blinks or closes the eye, or if the drops land on the outer lid margins, repeat the procedure.
 - (4) After instilling the drops, ask the patient to close the eye gently.
 - (5) When administering medications that cause systemic effects, apply gentle pressure with your finger and a clean tissue on the patient's nasolacrimal duct for 30–60 seconds.
 - B. Instill eye ointment:
 - (1) Ask the patient to look at the ceiling.
- The use of gloves reduces the transmission of microorganisms and follows standards to prevent accidental exposure to body fluids. Warming the eye drops reduces irritation to the eye.
 - Rolling the container ensures the medication is mixed before administration. Shaking the bottle causes bubbles, which makes medication administration difficult.
 - This position provides easy access to the eye for medication instillation and minimizes drainage of medication through the tear duct.
 - Crusts or drainage harbours microorganisms. Soaking allows easy removal of the crusts and prevents pressure from being applied directly over the eye. Cleansing from the inner canthus to the outer canthus avoids entrance of microorganisms into the lacrimal duct.
 - Cotton or tissue absorbs the medication that escapes the eye.
 - This technique exposes the lower conjunctival sac. Retraction against the bony orbit prevents pressure and trauma to the eyeball and prevents your fingers from touching the eye.
 - When the patient looks toward the ceiling, this action retracts the sensitive cornea up and away from the conjunctival sac and reduces stimulation of the blink reflex.
 - This technique helps to prevent accidental contact of the eyedropper with eye structures, thus reducing risk of both injury to the eye and transfer of infection to dropper. Ophthalmic medications are sterile.
 - The conjunctival sac normally holds 1 or 2 drops, which provides even distribution of medication across the eye.
 - The patient obtains the therapeutic effect of the drug only when the eyedrops enter the conjunctival sac.
 - Closing the eye helps to distribute the medication. Squinting or squeezing of eyelids forces medication from the conjunctival sac (VisionRx, 2005).
 - This action prevents both the overflow of medication into the nasal cavity.
 - This action retracts the sensitive cornea up and away from the conjunctival sac and reduces stimulation of the blink reflex.

Continued

► **SKILL 33-2 Administering Ophthalmic Medications—cont'd**

video

- (2) Hold the ointment applicator above the lower lid margin, apply a thin stream of ointment evenly along the inner edge of the lower eyelid on the conjunctiva (see Step 19B [2] illustration) from the inner canthus to outer canthus.



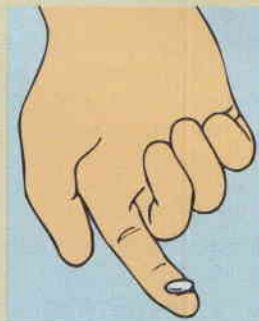
Step 19A (1) Hold the eyedropper above the conjunctival sac.

- (3) Have the patient close the eye and use a cotton ball to rub the lid lightly in a circular motion, if rubbing is not contraindicated.

C. Intraocular disc

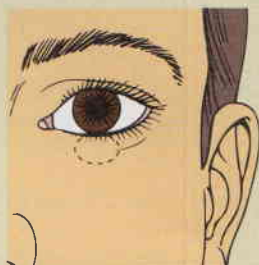
(1) Application:

- Open the package containing the disc. Gently press your fingertip against the disc so that it adheres to your finger. Position the convex side of the disc on your fingertip (see Step 19C[1][a] illustration).
- With your other hand, gently pull the patient's lower eyelid away from the eye. Ask the patient to look up.
- Place the disc in the conjunctival sac, so that it floats on the sclera between the iris and the lower eyelid (see Step 19C[1][c] illustration).



Step 19C(1)(a) Gently position the convex side of the disc against your fingertips.

- (d) Pull the patient's lower eyelid out and over the disc (see Step 19C[1][d] illustration).



Step 19C(1)(d) Gently pull the lower eyelid over the disc.

- This technique distributes the medication evenly across the eye and lid margin.

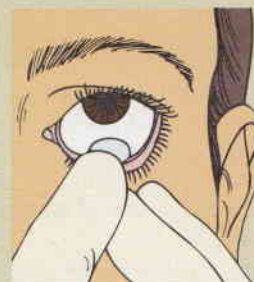


Step 19B (2) Apply ointment along the lower eyelid.

- This action further distributes the medication without traumatizing the eye.

- These actions allow you to inspect the disc for damage or deformity.

- This action prepares the conjunctival sac for receiving the medicated disc.
- This placement ensures delivery of the medication.



Step 19C(1)(c) Place the disc in the conjunctival sac between the iris and the lower eyelid.

- This action ensures accurate medication delivery.

► SKILL 33-2 Administering Ophthalmic Medications—cont'd



Critical Decision Point: You should not be able to see the disc at this time. If you can see the disc, repeat step 19C(1)d.

(2) Removal:

- (a) Perform hand hygiene and put on gloves.
- (b) Explain the procedure to the patient.
- (c) Gently pull on the patient's lower eyelid to expose the intraocular disc.
- (d) Using your forefinger and thumb of the opposite hand, pinch the disc and lift it out of the patient's eye (see Step 19C(2)[d] illustration).



Step 19C(2)(d) Carefully pinch the disc to remove it from the patient's eye.

20. If excess medication is on the eyelid, gently wipe it from the inner canthus to outer canthus.
 21. If the patient wears an eye patch, apply a clean patch by placing it over the affected eye so that the entire eye is covered. Tape securely without applying pressure to eye.
- Wiping away of excess medication promotes the patient's comfort and prevents trauma to eye (Vision Rx, 2005).
 - A clean eye patch reduces the chance of infection.

Critical Decision Point: If the patient receives more than one eye medication to the same eye at the same time, wait at least 5 minutes before administering the next medication to avoid interaction between medications (Vision Rx, 2005).

22. If the patient receives eye medication to both eyes at the same time, use a different tissue or cotton ball for each eye.
 23. Remove gloves, dispose of soiled supplies in proper receptacle, and perform hand hygiene.
 24. Note the patient's response to instillation; ask whether the patient felt any discomfort.
 25. Observe the patient's response to the medication by assessing any visual changes and noting any side effects.
 26. Ask the patient to discuss the medication's purpose, action, side effects, and the technique of administration.
 27. Have the patient demonstrate self-administration of the next dose.
- The use of separate tissues or cotton balls prevents cross-contamination between eyes.
 - The patient's response determines whether the procedure was performed correctly and safely and whether the patient is experiencing adverse effects of the medication.

Unexpected Outcomes

Inability of patient to instill drops without supervision

Signs of reaction to medication, such as allergic reaction (e.g., tearing, reddened sclera) or systemic response (e.g., bradycardia)

Related Interventions

- Reinforce your teaching and allow the patient to self-administer drops as often as possible to enhance confidence.
- If the patient cannot self-administer drops, teach others, such as family members, to instill drops into the patient's eye.
- Follow the institutional policy or guidelines for the reporting of adverse or allergic reaction to medications.
- Notify the patient's health care provider immediately, and withhold further administration of the medication.
- Add information about the allergy to the patient's medical record, according to agency policy.

Recording and Reporting

- Document on the MAR or the computer record the medication, concentration, number of drops, time of administration, and the eye (left, right, or both) that received medication.
- Record the appearance of the eye in the nurses' notes.

Home Care Considerations

- Patients with chronic health care problems should consult with their health care provider before they use over-the-counter eye medication.
- When they use eye drops at home, patients should not share medications with other family members because the risk of infection transmission is high.

Intraocular Administration. Some medications are administered intraocularly (see Skill 33-2). Intraocular medications resemble a contact lens. Place the medication into the conjunctival sac, where it remains in place for up to one week. Medications such as pilocarpine are administered this way. You will need to teach the patient about monitoring for adverse reactions to the disc. Patients will also need to be taught how to insert and remove the disc.

Ear Instillation. Internal ear structures are very sensitive to temperature extremes. Failure to instill ear drops or irrigating fluid at room temperature may cause vertigo (severe

dizziness) or nausea. Although the structures of the outer ear are not sterile, sterile drops and solutions are used in case the eardrum is ruptured. The entrance of nonsterile solutions into middle ear structures can result in infection. If the patient has ear drainage, assess the ear to ensure the patient does not have a ruptured eardrum. Never occlude the ear canal with the dropper or an irrigating syringe. Forcing medication into an occluded ear canal creates pressure that will injure the eardrum. Box 33-18 provides guidelines for administering ear drops and ear irrigations and describes the differences in straightening the ear canal for children and adults.

► BOX 33-18 Procedural Guideline

Administering Ear Medications

Delegation Considerations:

The administration of ear medications cannot be delegated. Instruct unregulated care providers about the potential side effects of ear medications and the need to report their occurrence immediately.

Equipment:

- Medication administration record (MAR)
- Clean gloves if patient has drainage from the ear
- Medication bottle with dropper, cotton-tipped applicator, and cotton ball (optional) if ear drops are being administered
- Irrigating syringe, kidney-shaped basin, and towel if ear is to be irrigated

Procedure:

1. Check the accuracy and completeness of each MAR or computer printout against the prescriber's original medication order. Check the patient's name and the medication name, dosage, route, and time for administration. Copy or rewrite any portion of the MAR that is difficult to read.
2. Prepare the medication. Ensure that you compare the label of the medication against the MAR at least two times during the medication preparation.
3. Take the medication to the patient at the correct time and perform hand hygiene. Put on gloves if drainage is present.
4. Identify the patient by using at least two patient identifiers. Compare the patient's name and one other identifier (e.g., the hospital identification number) on the MAR, computer printout, or computer screen with information on the patient's identification bracelet. Ask the patient to state his or her name if possible, for a third identifier.
5. Compare the label on the medication with the MAR one more time at the patient's bedside. *This is the third accuracy check.*
6. Explain the procedure to the patient regarding positioning and the sensations to expect, such as hearing bubbling or feeling water in the ear as medication trickles into the ear.
7. Teach the patient about the medication.
8. Administer the ear drops:
 - A. Have the patient assume a side-lying position (if this position is not contraindicated by patient's condition) with the ear to be treated facing up. Alternatively, the patient may sit in a chair or at the bedside.
 - B. Perform hand hygiene. Put on gloves if drainage is present.
 - C. Straighten the ear canal by pulling the auricle down and back (for children under three years of age) or upward and outward (for adults).
 - D. Hold the dropper 1 cm above the ear canal and instill the prescribed drops (see Step 8D illustration).
 - E. Ask the patient to remain in a side-lying position for two to three minutes. Apply gentle massage or pressure to the tragus of the ear with your finger unless contraindicated due to pain.
 - F. If a cotton ball is needed, place the cotton ball into the outermost part of the ear canal. Do not press cotton deep into the canal. Remove cotton after 15 minutes.
9. Administer ear irrigations:
 - A. Assess the tympanic membrane or review the medical record for a history of eardrum perforation, which would contraindicate ear irrigation.
 - B. Assist the patient in assuming a sitting or lying position with the head tilted or turned toward the affected ear. Place a towel under the patient's head and shoulder and have the patient hold a kidney-shaped basin under the affected ear.
 - C. Perform hand hygiene. Put on gloves if drainage is present.
 - D. Fill the irrigating syringe with approximately 50 mL of the solution.
 - E. Gently grasp the auricle and straighten the ear canal by pulling it down and back (for children under three years of age) or upward and outward (for children four years of age and older and adults).
 - F. Slowly instill the irrigating solution by holding the tip of the syringe 1 cm above the opening of the ear canal. Allow the fluid to drain out during instillation. Continue until the canal is clean or until all solution is used.
10. Clean the work area and put the medication supplies away.
11. Remove gloves and perform hand hygiene.
12. Document medication administration on the MAR or computer record.
13. Evaluate the patient's response to the medication.



Step 8D Placing ear drop in ear.

The external ear structures of children differ from those of adults. When instilling drops or irrigating solutions, you must first straighten the ear canal. In infants and young children, straighten the cartilaginous canal by grasping the auricle of the ear and pulling it gently down and backward. In adults, the ear canal is longer and composed of underlying bone. The adult ear canal is straightened by pulling the auricle upward and outward. Failure to straighten the canal properly may prevent medicinal solutions from reaching the deeper external ear structures.

Vaginal Instillation. Vaginal medications are available as suppositories, foam, jellies, and creams. Suppositories are individually packaged in foil wrappers and are sometimes stored in a refrigerator to prevent the solid, oval-shaped suppositories from melting. After a suppository is inserted into the vaginal cavity, body temperature causes it to melt and be distributed and absorbed. Foam, jellies, and creams are administered with an applicator inserter (Box 33-19). Give a suppository with a gloved hand in accordance with standard precautions and routine practices (see Chapter 32). Patients often prefer administering their own vaginal medications, which requires privacy. After instillation of the medication, a patient may wish to wear a perineal pad to collect the

drainage. Because vaginal medications are often given to treat infection, the discharge may be foul smelling. Follow aseptic techniques and offer the patient frequent opportunities to maintain her perineal hygiene (see Chapter 37).

Rectal Instillation. Rectal suppositories are thinner and more bullet-shaped than vaginal suppositories. The rounded end prevents anal trauma during insertion. Rectal suppositories contain medications that exert local effects, such as promoting defecation, or systemic effects, such as reducing nausea. Rectal suppositories are usually stored in the refrigerator until administered.

During administration, place the suppository past the internal anal sphincter and against the rectal mucosa (Box 33-20). Otherwise, the suppository may be expelled before it can dissolve and be absorbed into the mucosa. With practice, you learn to recognize the sensation of the sphincter relaxing around the finger. Do not force the suppository into a mass of fecal material. If necessary, clear the rectum with a small cleansing enema before inserting a suppository.

Administering Medications by Inhalation

Medications administered by hand-held inhalers are dispersed through an aerosol spray, mist, or powder that penetrates the

► BOX 33-19 Procedural Guideline

Administering Vaginal Medications

Delegation Considerations:

The administration of medications by the vaginal route cannot be delegated. Instruct unregulated care providers to report new or increased vaginal discharge or bleeding and occurrence of potential side effects of the medications immediately.

Equipment:

- Vaginal cream, foam, jelly, or suppository, or irrigating solution with applicator (if required)
- Clean, disposable gloves
- Towels, or a washcloth, or both
- Paper towels
- Perineal pad
- Drape or sheet
- Water-soluble lubricating jelly
- Medication administration record (MAR) or computer printout

Procedure:

1. Check the accuracy and completeness of each MAR or computer printout against the prescriber's original medication order. Check the patient's name and the medication name, form (cream, foam, jelly, or suppository), route, dosage, time of administration, and drug indication.
2. Review the patient's history of allergies, including allergies to latex. Prepare the medication (see Skill 33-1, Steps 7A–G and M–O). Compare the label of the medication with the MAR two times while preparing the medication.
3. Take the medication to the patient at the correct time and perform hand hygiene.
4. Identify the patient by using at least two patient identifiers. Compare the patient's name and one other identifier (e.g., the hospital identification number) on the MAR, computer printout, or computer screen with information on the patient's identification bracelet. Ask the patient to state his or her name if possible, for a third identifier.
5. Allow the patient to empty or attempt to empty her bladder before administration of vaginal medication. To facilitate adequate absorption, the patient needs to lie quietly for at least 10 minutes.
6. Compare the label on the medication with the MAR one more time at the patient's bedside.
7. Teach the patient about the medication. Explain to the patient the procedure for positioning and the sensations she can expect, such as feelings of moisture or wetness in the vaginal area. Assess the patient's ability to manipulate the applicator or suppository and to position herself to insert the medication. Explain the procedure to the patient. If the patient plans to self-administer the medication, be specific in your explanation.
8. Close the room curtain or door and arrange the supplies at the bedside.
9. Assist the patient to lie in a dorsal recumbent position. This position provides full exposure and easy access to the vaginal canal and allows the suppository to dissolve without escaping through an orifice.
10. Put on clean, disposable gloves.
11. Keep the abdomen and lower extremities draped.
12. Ensure the lighting is adequate to visualize the vaginal opening. Inspect the condition of external genitalia and the vaginal canal, noting the appearance of any discharge. Clean the area with a towel or washcloth if necessary.
13. Insert the vaginal suppository:
 - A. Remove the suppository from its foil wrapper. Apply a liberal amount of sterile water-based lubricating jelly to the smooth or rounded end of the suppository. Lubricate the gloved index finger of your dominant hand.
 - B. With your nondominant gloved hand, expose the vaginal orifice by gently retracting the labial folds.
 - C. With your dominant gloved hand, gently insert the rounded end of the suppository along the posterior wall of the vaginal

Continued

► BOX 33-19 Procedural Guideline—cont'd



Step 13C Insertion of a suppository into the vaginal canal.

canal for the entire length of your finger (7.5 to 10 cm) to ensure equal distribution of the medication along the walls of the vaginal cavity (see Step 13C illustration).

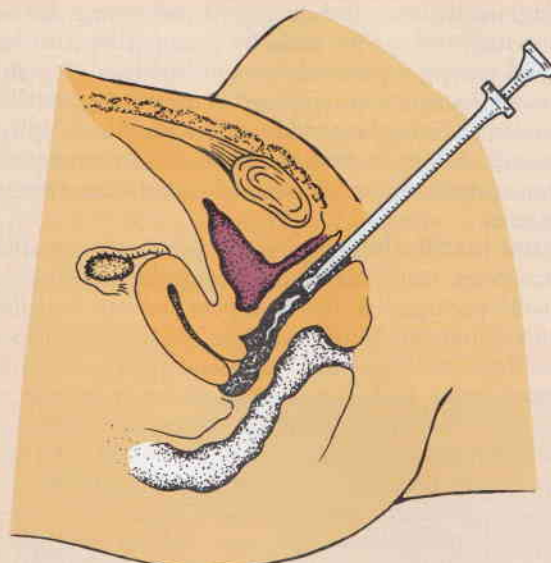
D. Withdraw your finger and wipe any remaining lubricant from around the orifice and labia.

14. Administer the cream or foam:

A. Fill the cream or foam applicator, as described on the package directions.

B. With your nondominant gloved hand, expose the vaginal orifice by gently retracting the labial folds.

C. With your dominant gloved hand, insert the applicator approximately 5 to 7.5 cm. Push the applicator plunger to deposit the medication into the vagina to allow equal distribution of medication (see Step 14C illustration).



Step 14C Instillation of medication in the vaginal canal.

D. Withdraw the applicator and place it on a paper towel. Wipe residual cream from the labia or vaginal orifice.

15. Dispose of supplies, remove gloves, and perform hand hygiene.

16. Instruct the patient to remain on her back for at least 10 minutes.

17. Document the medication administration on the MAR or computer record.

18. If the applicator was used, wear gloves to wash it with soap and warm water, rinse, and store for future use.

19. Offer the patient a perineal pad when she resumes ambulation to prevent vaginal discharge from spreading to clothing.

20. Inspect the appearance of discharge from the vaginal canal and the condition of external genitalia between applications to evaluate the medication's effectiveness.

lung airways. The alveolocapillary network absorbs medications rapidly. **Metered-dose inhalers (MDIs)**, dry powder inhalers (DPIs), and slow-stream inhaler devices usually produce local effects, such as bronchodilatation; however, some medications can lead to serious systemic side effects.

Patients who receive medications by inhalation frequently have chronic respiratory disease, such as chronic asthma, emphysema, or bronchitis. Medications given by inhalation provide these patients with control of their airway obstruction. Inhaled medications are often described as “rescue” or “maintenance” medications. Rescue medications are short-acting medications that are taken for immediate relief of acute respiratory distress. Maintenance inhalers are used on a daily scheduled basis to prevent acute respiratory distress. The effects of maintenance inhalers start within hours of administration and last for a longer period of time than rescue inhalers. Because these patients depend on these medications for disease control, they must learn about the inhalers and how to administer them safely (Skill 33-3). If a patient uses more than one type of inhaler, the bronchodilator is given first.

A metered-dose inhaler (MDI) delivers a measured dose of medication with each push of the canister. Chemical propellants (e.g., hydrofluorocarbons) push the medication out of the

MDI. MDIs are either squeeze-and-breathe inhalers or inhalers activated by the patient's breath. The squeeze-and-breathe MDI requires the application of approximately 2 to 5 kg of pressure to the top of the canister to administer the medication. To use this type of MDI, the patient must have hand strength, which often diminishes as a result of aging or the effects of chronic respiratory disease. Lack of sufficient hand strength can restrict the patient's ability to self-administer medication via MDIs. Breath-activated MDIs release the medication when the patient inhales. Release of the medication is dependent on the strength of the patient's breath on inspiration (Capriotti, 2005). The MDI can be used with a spacer to allow the particles of medication to slow down and break into smaller pieces, which improves the drug's absorption in the patient's airway. Spacers are equipped with a face mask when they are used by infants and children younger than four years of age. Spacers are especially helpful for patients who have difficulty coordinating the steps involved in self-administering inhaled medications. When patients do not use their inhalers and spacers correctly, they do not receive the full effect of the medication. Therefore, patient education is essential.

Dry powder inhalers (DPIs) hold dry, powdered medication and create an aerosol when the patient inhales through a

BOX 33-20 Procedural Guideline

Administering Rectal Suppositories

Delegation Considerations:

The administration of medications by the rectal route cannot be delegated. Instruct unregulated care providers to expect and report fecal discharge or a bowel movement and to report the occurrence of potential side effects or medications immediately.

Equipment:

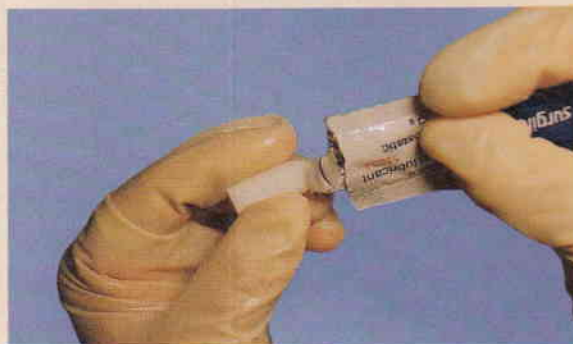
- Rectal suppository
- Water-soluble lubricating jelly
- Clean gloves (two pair)
- Drape or sheet
- Tissue
- Medication administration record (MAR) or computer printout

Procedure:

1. Check the accuracy and completeness of each MAR or computer printout against the prescriber's original medication order. Check the patient's name and the medication name, route, dosage, and time of administration. Copy or rewrite any portion of the MAR that is difficult to read.
2. Review the medical record for information on rectal surgery, bleeding, and for a history of allergies.
3. Prepare medication (see Skill 33-1, Steps 7A–G and M–O). Ensure that you compare the label of the medication with the MAR two times during medication preparation.
4. Take the medication to the patient at the correct time and perform hand hygiene.
5. Identify the patient by using at least two patient identifiers. Compare the patient's name and one other identifier (e.g., the hospital identification number) on the MAR, computer printout, or computer screen with information on the patient's identification bracelet. Ask the patient to state his or her name if possible, for a third identifier.
6. Compare the label of the medication with the MAR or computer printout one more time at the patient's bedside.
7. Teach the patient about the medication. Explain the procedure to the patient regarding the positioning and the sensations to expect, such as feelings of needing to defecate. Ensure that the patient understands the procedure and he or she can self-administer the medication.
8. Close the room curtain or door and arrange supplies at the bedside.
9. Put on clean gloves.
10. Assist the patient in assuming Sims' position to expose the anus and facilitate relaxation of the external anal sphincter. Keep the patient draped with only the anal area exposed.
11. Ensure the lighting is adequate to visualize the anus. Check for evidence of active rectal bleeding. Examine the condition of the

anus externally and palpate the rectal walls to assess for presence of feces, which may interfere with the suppository placement (see Chapter 31). Dispose of gloves in proper receptacle if they are soiled.

12. Put on a new pair of disposable gloves (if previous gloves were discarded).
13. Remove the suppository from its wrapper and lubricate the rounded end (see Step 13 illustration) with a sterile water-soluble lubricating jelly to reduce the friction when the suppository enters the rectal canal. Lubricate the index finger of your dominant hand with a water-soluble lubricant.



14. Ask the patient to take slow deep breaths through the mouth and relax the anal sphincter.
15. Retract the buttocks with your nondominant hand. Insert the suppository gently through the anus, past the internal sphincter and against the rectal wall, 10 cm in adults, 5 cm in children and infants. Apply gentle pressure to hold the buttocks together momentarily if necessary to keep medication in place and to facilitate medication distribution and absorption.
16. Withdraw your finger and wipe the anal area with tissue.
17. Remove gloves and dispose of medication supplies in the appropriate receptacle and perform hand hygiene.
18. Ask the patient to remain flat or on the side for five minutes to prevent expulsion of the suppository.
19. If the suppository contains a laxative or fecal softener, place a call light within the patient's reach.
20. Document medication administration on the MAR or computer record.
21. Evaluate the effectiveness of the medication by observing the patient for a response to the suppository (e.g., bowel movement, relief of nausea) at times that correlate with the medication's onset, peak, and duration.

reservoir that contains a dose of the medication. DPIs require less manual dexterity than MDIs, and because the device is activated by the patient's breath, the patient does not need to coordinate puffs with inhalation, as required when an MDI is used. DPIs do not require use of a spacer; however, the medication inside the DPI may clump if the DPI is used in a humid climate, and some patients cannot inspire at the speed needed to administer the entire dose of the medication.

One important aspect of patient teaching is to help the patient determine when the MDI or DPI is empty and needs to

be replaced. Floating the MDI to determine the amount of medication remaining is no longer recommended because extra propellant may cause buoyancy even if no medication remains in the inhaler. Furthermore, MDIs with hydrofluoroalkanes (HFA) should never be immersed (Capriotti, 2005). Some DPIs have mechanisms that indicate the number of doses remaining; however, these mechanisms are not always accurate. To calculate how long the medication in an MDI or DPI will last, divide the capacity of the canister by the number of doses the patient takes per day. For example, a patient is to take albuterol, a

► SKILL 33-3 Using Metered-Dose or Dry Powder Inhalers

Delegation Considerations

The administration of a metered-dose inhaler (MDI) or dry powder inhaler (DPI) and the supervision of patients who self-administer these medications cannot be delegated to unregulated care providers (UCPs). Instruct UCPs to report changes in the patient's respiratory status, increased coughing, or the occurrence of potential side effects immediately.

Procedure

STEPS

1. Check the accuracy and completeness of each MAR or computer printout against the prescriber's original medication order. Check the patient's name and the medication name, route, dosage, and time of administration. Copy or rewrite any portion of the MAR that is difficult to read.
2. Assess the patient's respiratory pattern, auscultate the patient's breath sounds.
3. Assess the patient's ability to hold, manipulate, and depress the canister. Assess the patient's strength of inhalation.
4. Assess the patient's readiness to learn: for example, whether the patient asks questions about the medication, disease, or complications; requests education in use of inhaler; is mentally alert; participates in self-care.
5. Assess the patient's ability to learn: the patient should not be fatigued, in pain, or in respiratory distress; assess the patient's level of understanding of technical terms.
6. Assess the patient's knowledge and understanding of the disease and the purpose and action of the prescribed medications.
7. Determine the medication schedule and the number of inhalations prescribed for each dose.
8. Prepare the medication (see Skill 33-1, Steps 7A–G and M–O). Ensure that you compare the label of the medication with the MAR two times during medication preparation.
9. Identify the patient by using at least two patient identifiers. Compare the patient's name and one other identifier (e.g., the hospital identification number) on the MAR, computer printout, or computer screen with information on the patient's identification bracelet. Ask the patient to state his or her name if possible, for a third identifier.
10. Compare the label on medications with the MAR one more time at the patient's bedside.
11. Instruct the patient in a comfortable environment by sitting in a chair in the hospital room or by sitting at a kitchen table in the patient's home.
12. Provide adequate time for the teaching session.
13. Perform hand hygiene and arrange the equipment needed.
14. Allow the patient an opportunity to manipulate the inhaler, the canister, and the spacer device. Explain and demonstrate how the canister fits into the inhaler.

Equipment

- MDI or DPI
- Spacer (optional with MDI)
- Facial tissues (optional)
- Washbasin or sink with warm water
- Paper towel
- Medication administration record (MAR) or computer printout

RATIONALE

- Assessment of the patient's respiratory pattern establishes the baseline of airway status for comparison during and after treatment.
- Any impairment in the ability to grasp, to breathe, or to coordinate movements interferes with the patient's ability to use the MDI or DPI correctly.
- The patient's readiness to learn affects the ability to understand explanations and actively participate in the learning process (Bastable, 2003).
- The patient's mental or physical limitations affect the ability to learn and the methods you can use for instruction (Bastable, 2003).
- Knowledge of disease is essential for the patient to understand the proper use of the inhaler.
- The medication schedule influences the explanations you provide for use of inhaler.
- The patient will be more likely to remain receptive to education if he or she is in a comfortable environment (Bastable, 2003).
- Manipulating the various items facilitates the patient's familiarity with the equipment.

Critical Decision Point: If the patient is using an MDI with or without a spacer and the inhaler is new or has not been used for several days, push a "test spray" into the air (MayoClinic.com, 2007). A test spray is not needed for a DPI.

15. Explain to the patient what a metered dose is and warn the patient about overuse of the inhaler, including medication side effects.
16. Explain the steps for administering squeeze-and-breathe inhaled dose of medication of MDI (demonstrate steps when possible):
 - A. Insert the MDI canister into the holder.
 - B. Remove the mouthpiece cover from the inhaler.
 - C. Shake the inhaler vigorously five or six times.
- The patient must not arbitrarily administer excessive inhalations because of the risk of serious side effects. If medication is given in recommended doses, side effects are uncommon.
- Use of simple, step-by-step explanations allows the patient to ask questions at any point during the procedure.
- Shaking the inhaler ensures that fine particles are aerosolized.

► SKILL 33-3 Using Metered-Dose or Dry Powder Inhalers—cont'd

- D. Have the patient take a deep breath and exhale.
- E. Instruct the patient to position the inhaler in one of two ways.
- (1) Close the mouth around the MDI with the opening toward the back of the throat (see Step 17E(1) illustration).
 - (2) Position the device 2–4 cm in front of the mouth (see Step 17E(2) illustration).



Step 17E (1) The patient opens lips and places inhaler in mouth with opening toward back of throat.

- F. With the inhaler properly positioned, have patient hold the inhaler with thumb at the mouthpiece and the index finger and middle finger at the top. This arrangement is called a three-point or lateral hand position.
- G. Instruct the patient to tilt the head back slightly and inhale slowly and deeply through the mouth for 3–5 seconds while depressing the canister fully.
- H. Instruct the patient to hold the breath for approximately 10 seconds.
- I. Instruct the patient to remove the MDI from the mouth and to exhale through pursed lips.
17. Explain the steps to administer MDI by using a spacer, such as an AeroChamber (demonstrate when possible):
- A. Remove the mouthpiece cover from the MDI and the mouthpiece of the spacer. Inspect the spacer for foreign objects. If the spacer has a valve, ensure the valve is intact.
 - B. Insert the MDI into the end of the spacer.
- C. Shake the inhaler vigorously five or six times.
- D. Have the patient exhale completely before closing the mouth around the mouthpiece of the spacer. Avoid covering small exhalation slots with the lips (see Step 18D illustration).



Step 18D Have the patient place the mouthpiece in the mouth and close the lips, being careful to keep the exhalation slots exposed.

- A deep breath followed by an exhalation empties the lungs and prepares the patient's airway to receive the medication.
- This position directs the aerosol spray toward the airway. Positioning the mouthpiece in front of mouth is considered the best way to deliver the medication.



Step 17E(2) The patient positions the mouthpiece 2 to 4 cm away from the mouth. This placement is considered the best way to deliver the medication.

- MDIs work best when patients use a three-point or lateral hand position to activate the canister.
- Medication is distributed to airways during inhalation. Inhalation through the mouth rather than the nose draws medication more effectively into airways.
- Holding the breath allows tiny drops of aerosol spray to reach the deeper branches of the airways.
- Using pursed lips keeps the small airways open during exhalation.
- The spacer traps medication released from the MDI; the patient then inhales the drug from the device. These devices break up and slow down the medication particles, enhancing the amount of medication received by the patient (Vella & Grech, 2005).
- Shaking the enhaler ensures the fine particles are aerosolized.

► SKILL 33-3 Using Metered-Dose or Dry Powder Inhalers—cont'd

- E. Have the patient depress the medication canister, spraying one puff into the spacer.
 - F. Instruct the patient to inhale deeply and slowly through the mouth for 3–5 seconds.
 - G. Instruct the patient to hold the breath for 10 seconds.
 - H. Instruct the patient to remove the MDI and spacer before exhaling.
18. Explain the steps to administer DPI or breath-activated MDI (demonstrate when possible):
- A. Remove the cover from the mouthpiece. Do not shake the inhaler.
 - B. Prepare the medication as directed by the manufacturer (e.g., hold the inhaler upright and turn the wheel to the right and then to the left until a click is heard, load the medication pellet, etc.).
 - C. Instruct the patient to exhale away from the inhaler before inhalation.
 - D. Position the mouthpiece between the patient's lips.
 - E. Instruct the patient to inhale deeply and forcefully through the mouth.
 - F. Instruct the patient to hold the breath for 5–10 seconds.
19. Instruct the patient to wait at least 20–30 seconds between inhalations of medications.
- The spacer emits a spray that allows finer particles to be inhaled.
 - Large droplets are retained in the spacer.
 - Deep inhalations maximize the amount of medication that enters the lungs.
 - Holding the breath ensures full medication distribution.
 - Removing the MDI and spacer allows the patient to exhale normally.
 - Preparing the medication properly primes the inhaler to ensure the medication will be delivered to the patient (Capriotti, 2005).
 - Exhaling before using the inhaler prevents loss of powder.
 - Properly positioning the mouthpiece prevents the medication from escaping through the mouth.
 - Deep inhalations create aerosol.
 - Holding the breath ensures full medication distribution.
 - Medications must be inhaled sequentially. The first inhalation opens the airways and reduces inflammation. The second or third inhalation penetrates the deeper airways.

Critical Decision Point: If two medications are to be administered, give the bronchodilator first.

20. Instruct the patient in cleaning the inhaler:
- A. Once a day, the inhaler and its cap should be rinsed in warm running water. The inhaler must be completely dry before use.
 - B. Twice a week, the L-shaped plastic mouthpiece should be washed with mild dishwashing soap and warm water. Rinse and dry well before placing the canister back inside the mouthpiece (Canadian Lung Association, n.d.).
21. Ask whether the patient has any questions.
22. Have the patient explain and demonstrate the steps in the use of an inhaler.
23. Ask the patient to explain the medication schedule, side effects, and when to call health care providers.
24. Ask the patient to calculate how many days the inhaler will last.
25. After the medication has been taken, assess the patient's respiratory status, including the ease of respirations, auscultation of lungs, and the use of pulse oximetry to assess the patient's oxygenation status.
- Accumulation of spray around the mouthpiece can interfere with proper distribution during use.
 - Regular cleaning removes residual medication. Do not place inhalers holding cromolyn, nedocromil, or HFA (hydrofluoroalkane) in water.
 - The patient has an opportunity to clarify misconceptions or misunderstandings.
 - A return demonstration provides feedback for measuring the patient's learning.
 - Reviewing the medication requirements improves the likelihood of compliance with the therapy.
 - This calculation helps the patient to determine when to reorder a prescription.
 - Assessment of the respiratory status determines the status of the patient's breathing pattern and adequacy of ventilation.

Unexpected Outcomes

Need for a bronchodilator more frequently than every 4 hours

Cardiac dysrhythmias, especially in patient receiving β -adrenergics

Inability of patient to self-administer medication properly

Paroxysms of coughing

Related Interventions

- Respiratory problems are indicated. The type of medication and delivery methods need to be reassessed. Notify the health care provider if respiratory status does not improve.
- If the patient experiences symptoms with the dysrhythmias (e.g., lightheadedness, syncope), withhold all further doses of medication and notify the prescriber.
- Explore alternative delivery routes or alternative methods of medication administration.
- Aerosolized particles irritate the posterior pharynx. Notify the prescriber; reassess the type of medication or the delivery method.

► SKILL 33-3 Using Metered-Dose or Dry Powder Inhalers—cont'd

Recording and Reporting

- Document the skills that you taught the patient and the patient's ability to perform these skills.
- Document on the MAR or computer record the medication, time of administration, and number of puffs.
- Report any undesirable effects from the medication.

Home Care Considerations

- Remind patients to carry their prescribed inhalers to use immediately in case of an acute asthma attack.

► BOX 33-21 Preventing Infection During an Injection

- To prevent contamination of the solution, draw the medication from the ampule quickly. Do not allow it to stand open.
- To prevent needle contamination, avoid letting the needle touch a contaminated surface (e.g., the outer edges of the ampoule or vial, the outer surface of the needle cap, your hands, a countertop, a table surface).
- To prevent syringe contamination, avoid touching the length of the plunger or the inner part of the barrel. Keep the tip of the syringe covered with a cap or needle.
- To prepare the skin, wash skin soiled with dirt, drainage, or feces with soap and water and then dry. Use friction and a circular motion to clean the skin with an antiseptic swab. Swab from centre of site and move outward in a 5 cm radius.

β -adrenergic agonist bronchodilator. The ordered dose is two puffs four times a day. The canister has a total of 200 puffs. Complete the following calculations to determine how long the MDI will last:

$$2 \text{ puffs} \times 4 \text{ times a day} = 8 \text{ puffs per day}$$

$$200 \text{ puffs} \div 8 \text{ puffs per day} = 25 \text{ days}$$

The canister in this example will last 25 days. To ensure the patient does not run out of medication, teach the patient to refill the medication prescription at least 7 to 10 days before it is expected to run out (MayoClinic.com, 2007).

Administering Medications by Irrigations

Some medications irrigate or wash out a body cavity and are delivered through a stream of solution. Irrigations most commonly use sterile water, saline, or antiseptic solutions to irrigate the eye, ear, throat, vagina, or urinary tract. Use aseptic technique if the patient has a break in the skin or mucosa. When the cavity to be irrigated is not sterile, as in the case of the ear canal (see Box 33-18) or vagina, use a clean technique. In health care settings, sterile solutions are usually used. Irrigations are used to clean an area, instill a medication, or apply heat or cold to injured tissue.

Administering Parenteral Medications

Parenteral administration of medications is the administration of medications by injection. Parenteral administration is an invasive procedure that must be performed with aseptic techniques (Box 33-21). After a needle pierces the skin, the patient is at risk of infection. Each type of injection requires the application of specific skills to ensure the medication

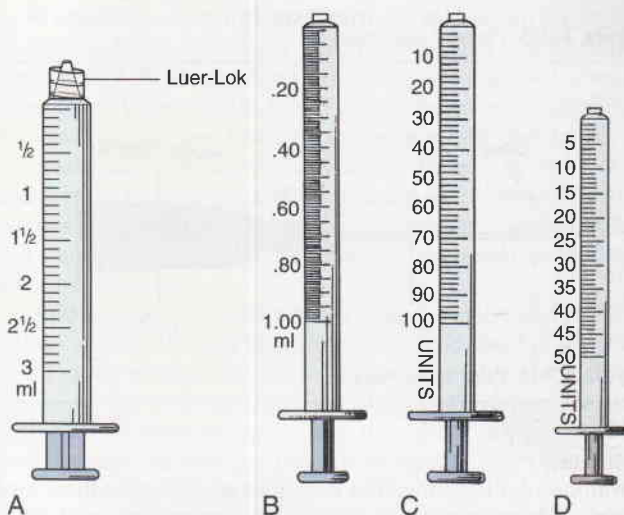


Figure 33-14 Types of syringes. **A**, Luer-Lok syringe marked in 0.1 (tenths). **B**, Tuberculin syringe marked in 0.01 (hundredths) for doses of less than 1 mL. **C**, Insulin syringe marked in units (100). **D**, Insulin syringe marked in units (50).

reaches the proper location. The effects of a parenterally administered medication develop rapidly, depending on the rate of medication absorption. Always closely observe the patient's response.

Equipment. A variety of syringes and needles are available, each designed to deliver a precise volume of medication to a specific type of tissue. Use your nursing judgement when determining the syringe or needle that will be most effective.

Syringes. Syringes consist of a close-fitting plunger and a cylindrical barrel with a tip designed to fit the hub of a hypodermic needle. Syringes, in general, are classified as being Luer-Lok or non-Luer-Lok. This nomenclature is based on the design of the syringe's tip. Luer-Lok syringes (Figure 33-14, **A**) require special needles, which are twisted onto the tip and lock in place. This design prevents the inadvertent removal of the needle. Non-Luer-Lok syringes (Figure 33-14, **B–D**) require needles that slip onto the tip. In clinical settings, all syringes now have safety devices to prevent needle-stick injuries.

Fill the syringe by aspiration, by pulling the plunger outward while the needle tip remains immersed in the prepared solution. You may handle the outside of the syringe barrel and the handle of the plunger. To maintain sterility, avoid letting any unsterile object touch the tip or the inside of the barrel, the hub, the shaft of the plunger, or the needle (Figure 33-15).

Syringes come in numerous sizes, from 0.5 mL to 60 mL. A 1 to 3 mL syringe is usually adequate for a subcutaneous or

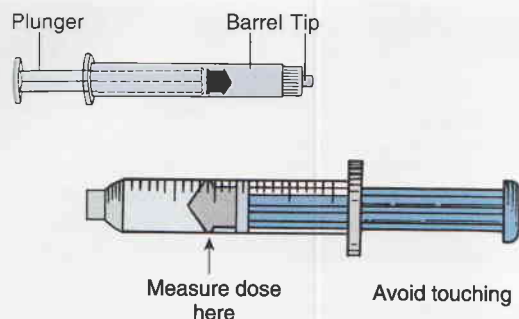


Figure 33-15 Parts of a syringe.

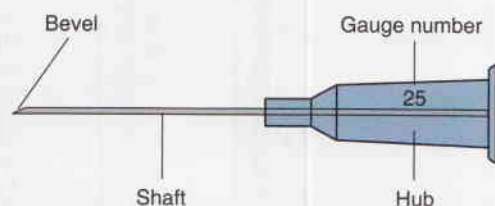


Figure 33-16 Parts of the needle.

intramuscular injection. The use of a syringe larger than 5 mL is unusual for an injection. The larger volume creates discomfort. Instead, use larger syringes to administer certain intravenous medications, to add medications to intravenous solutions, and to irrigate wounds or drainage tubes. Syringes may be prepackaged with a needle attached; however, you may change the needle size depending on the route of administration and the size of the patient.

Insulin syringes (see Figure 33-14, C-D) are available in sizes from 0.3 mL to 1 mL and are calibrated in units. Insulin syringes that hold 0.3 mL are known as low-dose syringes (30 units per 0.3 mL). Most insulin syringes are known as U-100s and are designed to be used with insulin that has a strength of U-100. Each millilitre of U-100 insulin contains 100 units of insulin.

The tuberculin syringe (see Figure 33-14, B) has a long, thin barrel with a preattached thin needle. The syringe is calibrated in sixteenths of a minim and in hundredths of a millilitre and has a capacity of 1 mL. Use a tuberculin syringe to prepare small amounts of medications (e.g., intradermal or subcutaneous injections). A tuberculin syringe is also useful when preparing small, precise doses for infants or young children.

Needles. Needles are packaged in individual sheaths to allow flexibility in choosing the right needle for a patient. Some needles are preattached to standard-sized syringes. Most needles are made of stainless steel and are disposable.

The needle has three parts: the hub, which fits onto the tip of a syringe; the shaft, which connects to the hub; and the bevel, or slanted tip (Figure 33-16). The tip of a needle, or the bevel, is always slanted. The bevel creates a narrow slit when it is injected into tissue.

When the needle is removed, the slit quickly closes to prevent leakage of medication, blood, or serum. Long bevelled tips are sharper and narrower to minimize discomfort to the patient when entering tissue used for subcutaneous or intramuscular (IM) injections.



Figure 33-17 Needles. Top to bottom: 19 gauge, 3.8 cm length; 20 gauge, 2.5 cm length; 21 gauge, 2.5 cm length; 23 gauge, 2.5 cm length; and 25 gauge, 1.6 cm length.

Needles vary in length from 0.6 to 7.6 cm (Figure 33-17). Choose the needle length according to the patient's size and weight and the type of tissue into which the medication is to be injected. In general, a child or slender adult requires a shorter needle. Use longer needles (2.5 to 3.8 cm) for intramuscular injections and use a shorter needle (1 to 1.6 cm) for subcutaneous injections.

Needle diameter is measured by gauge. As the gauge becomes smaller, the needle diameter becomes larger (see Figure 33-17). Gauge selection depends on the viscosity of fluid to be injected or infused. An intramuscular injection usually requires an 18- to 27-gauge needle, depending on the viscosity of the medication. Subcutaneous injections require small-diameter needles, such as a 25-gauge needle. A 26-gauge needle is used for an intradermal injection.

Disposable Injection Units. Disposable, single-dose, prefilled syringes are available for some medications. Ensure that you check the medication and concentration because all prefilled syringes look very similar. When using these syringes, you do not have to prepare medication doses, except perhaps to expel portions of unneeded medications.

The Tubex and Carpuject injection systems include reusable plastic mechanisms that hold prefilled, disposable, sterile cartridge-needle units (Figure 33-18). To prepare these systems, slip the cartridge into the syringe, secure it (by following the package directions), and check for air bubbles in the syringe. Advance the plunger to expel excess medication as you would with a regular syringe. A new type of injection system involves screwing a plungerlike device into the end of a prefilled vial that contains a needle. After the medication is given, safely dispose of the entire unit in a puncture-proof and leakproof receptacle. The design of these injection systems reduces the risk of needle-stick injuries.

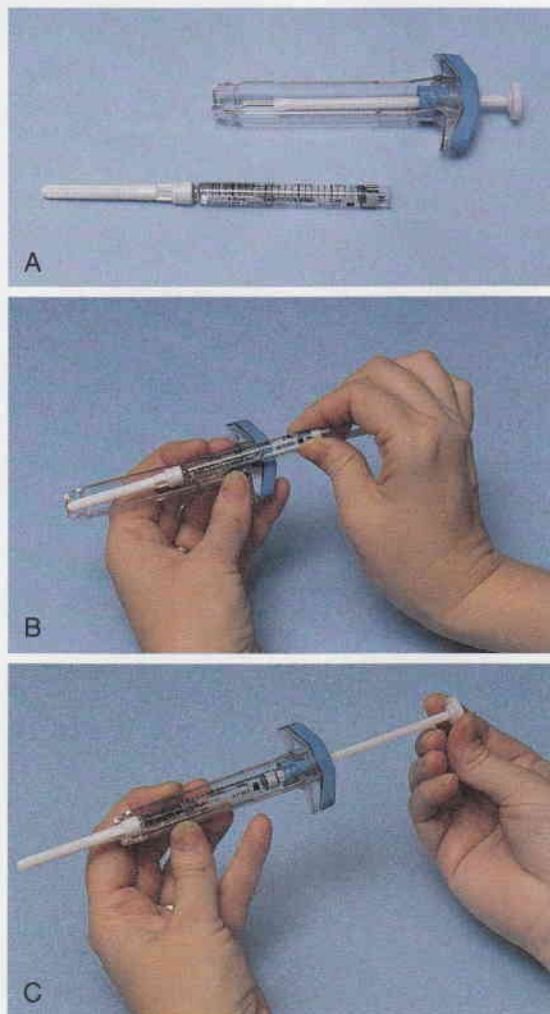


Figure 33-18 Disposable injection unit. A, Carpuject syringe and pre-filled sterile cartridge with needle. B, Assembling the Carpuject system. C, Cartridge locks at needle end; plunger screws into opposite end.

Preparing an Injection From an Ampule. Ampules contain single doses of medication in a liquid. Ampules are available in several sizes, from 1 mL to 10 mL or more (Figure 33-19, A). An ampule is made of glass with a constricted neck that must be snapped off to access the medication. A coloured ring around the neck indicates where the ampule is scored to be broken easily. Aspiration of the medication into a syringe (Skill 33-4) is sometimes completed by using a filter needle to prevent small glass fragments from entering the syringe (Stein, 2006). Change the filter needle to an appropriate-sized needle for the actual injection.

Preparing an Injection From a Vial. A vial is a single-dose or multidose container with a rubber seal at the top (see Figure 33-19, B). A metal cap protects the seal until it is ready to be used. Vials contain liquid or dry forms of medications. Medications that are unstable in solution are packaged dry. The vial label specifies the solvent or diluents to be used to dissolve the medication and the amount of diluents needed to prepare a desired medication concentration. Normal saline and sterile distilled water are solutions commonly used to dissolve medications.

Unlike the ampule, the vial is a closed system, and air must be injected into the vial to permit easy withdrawal of the solution. Failure to inject air creates a vacuum within the vial that makes withdrawal difficult (see Skill 33-4). If you are concerned about drawing up parts of the rubber stopper or other particles into the syringe, use a filter needle when preparing medications from vials (Nicoll & Hesby, 2002).

To prepare a powdered medication, draw up the amount of diluents or solvent recommended on the vial's label. Inject the diluent into the vial in the same manner used for injecting air into the vial. Most powdered medications dissolve easily, but you may need to withdraw the needle to mix the contents thoroughly. If this step is needed, remove the needle and gently roll the vial between your hands to dissolve the powdered medication, then reinsert the needle to draw up the dissolved medication. After mixing multidose vials, make a label that records the date and time of the mixing and indicates

Text continued on p. 719



Figure 33-19 A, Medication in ampules. B, Medication in vials.

► SKILL 33-4 Preparing Injections

Delegation Considerations

The preparation of injections cannot be delegated to unregulated care providers (UCPs).

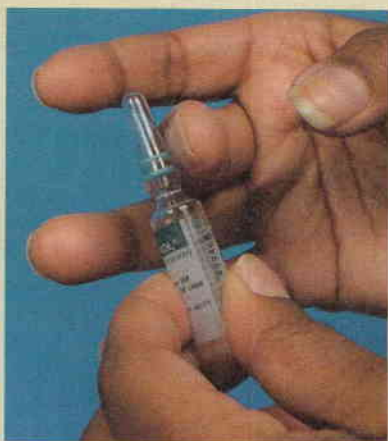
Equipment

- Medication administration record (MAR) or computer printout
- Medication in an ampule
- Syringe, needle, and filter needle
- Small gauze pad or unopened alcohol swab
- Medication in a vial
- Syringe
- Needles:
 - Blunt-tip vial access cannula (if a needleless system used)
 - Filter needle (if indicated)
 - Needle for drawing up medication (if needed) and needle for injection
- Small gauze pad or alcohol swab
- Diluent (e.g., normal saline or sterile water) (if indicated)

Procedure

STEPS

1. Check the accuracy and completeness of each MAR or computer printout against the prescriber's original medication order. Check the patient's name and the medication name, route, dosage, and time of administration. Copy or rewrite any portion of the MAR that is difficult to read.
2. Review the pertinent information related to the medication, including its action, purpose, side effects, and nursing implications.
3. Assess the patient's body build, muscle size, and weight.
4. Perform hand hygiene and assemble the medication supplies.
5. Check the date of expiration on the medication vial or ampule.
6. Prepare medication (see Skill 33-1, Steps 7A–G and M–O): Ensure that you compare the label of the medication with the MAR at least two times while preparing the medication.
 - A. Ampule preparation
 - (1) Tap the top of the ampule lightly and quickly with your finger until the fluid moves from the neck of the ampule (see Step 6A[1] illustration).



Step 6A(1) Tapping the ampule moves the fluid down the neck of the ampule.

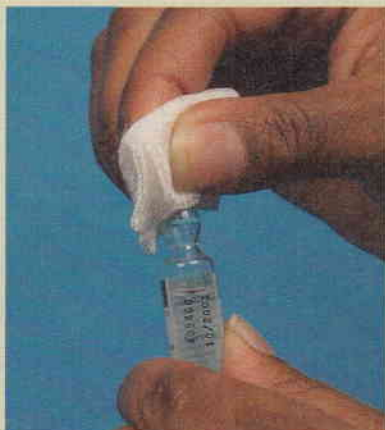
- (2) Place a small gauze pad or an unopened alcohol swab around the neck of the ampule (see Step 6A[2] illustration).

RATIONALE

- The patient's body type determines the type and size of the syringe and the needles for injection.
- Medication potency may increase or decrease when medications are expired.
- Tapping the ampule dislodges any fluid that collects above the neck of the ampule. All solution moves into the lower chamber of the ampule.
- Placing a pad around the neck of the ampule protects your fingers from injury when the glass tip is broken off.

► SKILL 33-4 Preparing Injections—cont'd

- (3) Snap the neck of the ampule quickly and firmly away from the hands (see Step 6A[3] illustration).



Step 6A(2) Gauze pad placed around the neck of the ampule.

- (4) Draw up the medication quickly, using a filter needle long enough to reach the bottom of the ampule.
- (5) Hold the ampule upside down, or set it on a flat surface. Insert the filter needle into the centre of the ampule opening. Do not allow the needle tip or shaft to touch the rim of the ampule.
- (6) Aspirate the medication into the syringe by gently pulling back on the plunger (see Step 6A[6] illustrations).

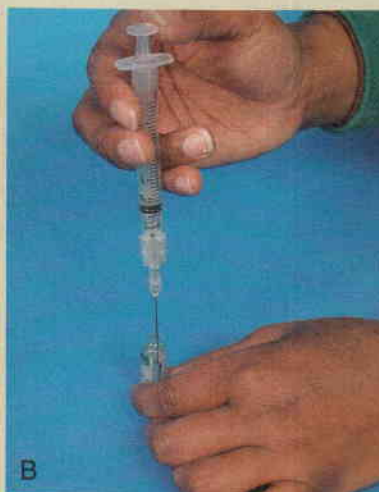


A



Step 6A(3) Snapping the neck of the ampule away from the hands.

- The injection system is vulnerable to airborne contaminants. The needle must be long enough to access the medication for preparation. Filter needles are used to sift out any fragments of glass (Stein, 2006).
- The broken rim of the ampule is considered contaminated. When the ampule is inverted, the solution dribbles out if the needle tip or shaft touches the rim of the ampule.
- Withdrawal of the plunger creates negative pressure within the syringe barrel, which pulls the fluid into the syringe.



B

Step 6A(6) A, Medication aspirated with the ampule inverted. B, Medication aspirated with the ampule on a flat surface.

- (7) Keep the needle tip under the surface of the liquid. Tip the ampule to bring all fluid within reach of the needle.
- (8) If air bubbles are aspirated, do not expel the air into the ampule.
- (9) To expel excess air bubbles, remove the needle from the ampule. Hold the syringe with the needle pointing up. Tap the side of the syringe to cause the bubbles to rise toward the needle. Draw back slightly on the plunger, then push the plunger upward to eject the air. Do not eject any fluid.
- (10) If the syringe contains excess fluid, dispose of it in a sink. Hold the syringe vertically with the needle tip up and slanted slightly toward the sink. Slowly eject the excess fluid into the sink. Recheck the fluid level in the syringe by holding it vertically.
- Keeping the needle tip under the surface of the liquid prevents the aspiration of air bubbles.
 - Expelling air into the ampule may force fluid out of the ampule, which could lead to loss of the medication.
 - Withdrawing the plunger too far will remove it from the barrel. Holding the syringe vertically allows fluid to settle in the bottom of the barrel. Pulling back on the plunger allows the fluid within the needle to enter the barrel so that fluid is not expelled. Air at the top of the barrel and within the needle is then expelled.
 - Medication is safely dispersed into the sink. The position of the needle allows the medication to be expelled without flowing down the needle shaft. Rechecking the fluid level ensures the proper dose.

Continued

► SKILL 33-4 Preparing Injections—cont'd

- (11) Cover the needle with its safety sheath or cap. Replace the filter needle with a needle or a needleless access device for injection.

B. Vial containing a solution

- (1) Remove the cap covering the top of the unused vial to expose the sterile rubber seal. If a multidose vial has been previously used, the cap has already been removed. Firmly and briskly wipe the surface of the rubber seal with an alcohol swab and allow it to dry.
- (2) Pick up the syringe and remove the needle cap or the cap covering the needleless vial access device (see Step 6B[2] illustration). Pull back on the plunger to draw an amount of air into the syringe equivalent to the volume of medication to be aspirated from the vial.



Step 6B(2) Syringe with needleless adapter.

Critical Decision Point: Some medications require that a filter needle be used when preparing medications from a vial. The same policy is required by some institutions. Check the agency policy to determine whether the use of a filter needle is indicated (Nicoll & Hesby, 2002). If using a filter needle to aspirate the medication, use an appropriately sized needle to administer the medication.

- (3) With the vial on a flat surface, insert the tip of the needle. Ensure the bevelled tip enters first, through the centre of the rubber seal (see Step 6B[3] illustration). Apply pressure to the tip of the needle during insertion.



Step 6B(3) Insert the tip of the needle through the centre of the vial diaphragm (with the vial flat on the table).

- Covering the needle prevents contamination of the needle and minimizes needle-stick injuries. Filter needles cannot be used for injection.
- The vial comes packaged with a seal that cannot be replaced after the cap has been removed. Not all drug manufacturers guarantee that caps of unused vials are sterile. Therefore, seals must be swabbed with alcohol before preparing the medication. Allowing the alcohol to dry prevents the needle from being coated with alcohol, which could mix with the medication.
- Inject air into the vial to prevent the buildup of negative pressure in the vial when aspirating medication.

► SKILL 33-4 Preparing Injections—cont'd

- (4) Inject air into the vial's airspace, holding on to the plunger. Hold the plunger with firm pressure; the plunger may be forced backward by air pressure within the vial.
- (5) Invert the vial while keeping a firm hold on the syringe and plunger (see Step 6B[5] illustration). Hold the vial between your thumb and the middle fingers of your nondominant hand. Grasp the end of the syringe barrel and plunger with the thumb and forefinger of your dominant hand to counteract pressure in the vial.



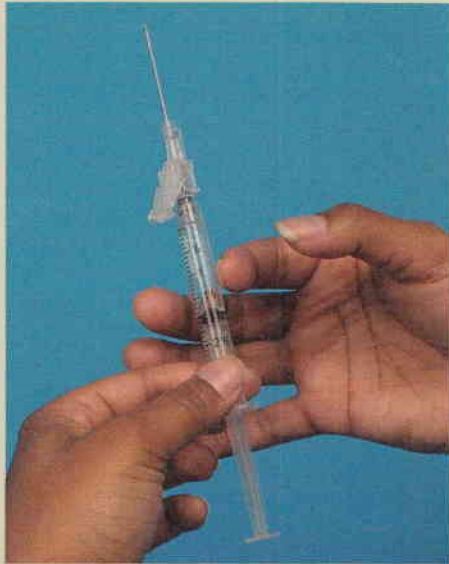
Step 6B(5) Withdraw fluid with the vial inverted.

- (6) Keep the tip of the needle below the fluid level.
 - (7) Allow air pressure from the vial to fill the syringe gradually with medication. If necessary, pull back slightly on the plunger to obtain the correct amount of solution.
 - (8) When the desired volume of solution is obtained, position the needle into the vial's airspace; tap the side of the syringe barrel carefully to dislodge any air bubbles. Eject any air remaining at the top of the syringe into the vial.
 - (9) Remove the needle from the vial by pulling back on the barrel of the syringe.
- Injecting air before aspirating the fluid creates a vacuum that is needed to allow the medication to flow into the syringe. Injecting air into the vial's airspace prevents the formation of bubbles, which can lead to an inaccurate dose.
 - Inverting the vial allows the fluid to settle in the lower half of the container. Correct positioning of your hands prevents forceful movement of the plunger and permits easy manipulation of the syringe.
 - Keeping the needle tip under the surface of the liquid prevents the aspiration of air.
 - Positive pressure within the vial forces the fluid into the syringe (unless the vial has been used several times).
 - Forcefully striking the barrel while the needle is inserted in the vial may bend the needle. The accumulation of air displaces the medication and can lead to dose errors.
 - Accidentally pulling the plunger instead of the barrel can cause the plunger to separate from the barrel, which can result in the loss of medication.

Continued

SKILL 33-4 Preparing Injections—cont'd

- (10) Hold the syringe at eye level, at a 90-degree angle, to ensure the correct volume has been obtained and no air bubbles are present. Remove any remaining air by tapping the barrel to dislodge the air bubbles (see Step 6B(10) illustration). Draw back slightly on the plunger; then push the plunger upward to eject the air. Do not eject the fluid. Recheck the volume of the medication.



Step 6B(10) Hold the syringe upright and tap the barrel to dislodge air bubbles.

- (11) If medication is to be injected into a patient's tissue, change the needle to one of the appropriate gauge and length according to the route of medication and the patient's size and weight.
- (12) For a multidose vial, make a label that includes the date of mixing, the concentration of the medication per millilitre, and your initials.
- C. Vial containing a powder (reconstituting medications)**
- (1) Remove the cap covering the vial of powdered medication and the cap covering the vial of proper diluent. Firmly wipe both seals with the alcohol swab and allow to dry.
 - (2) Draw up diluent into the syringe following the Steps 6B(2) through 6B(10).
 - (3) Insert the tip of the needle through the centre of the rubber seal on the vial of powdered medication. Inject the diluents into the vial. Remove the needle.
 - (4) Mix the medication thoroughly. Roll the vial in your palms. Do not shake.
 - (5) Reconstituted medication in the vial is ready to be drawn into a new syringe. Read the label carefully to determine the dose after reconstitution.
 - (6) Prepare medication in syringe following Steps 6B(2) through 6B(12).

- Holding the syringe vertically allows fluid to settle in the bottom of the barrel. Pulling back on the plunger allows the fluid within the needle to enter the barrel so that fluid is not expelled. Air at the top of the barrel and within the needle is then expelled.

- Inserting a needle through a rubber stopper may dull the bevelled tip. New needles are sharper. Because no fluid remains along the shaft, the needle will not track medication through the tissues.
- Labelling ensures that future doses will be prepared correctly. Some medications must be discarded after a certain number of days have elapsed since the mixing of the vial.
- Not all drug manufacturers guarantee that caps of unused vials are sterile. Therefore, seals must be swabbed with alcohol before preparing the medication. Allowing the alcohol to dry prevents the needle from being coated with alcohol, which could mix with the medication.
- Drawing up the diluent prepares the diluent for injection into a vial containing powdered medication.
- The diluent begins to dissolve and reconstitute medication.
- Rolling ensures proper dispersal of medication throughout the solution. Shaking produces bubbles.
- After the diluent has been added, the concentration of medication (mg/mL) determines the dose to be given.

Critical Decision Point: Some institutions may require prepared parenteral medications to be verified for accuracy by another nurse. Check the agency policy before administering medication.

► SKILL 33-4 Preparing Injections—cont'd

- Dispose of all soiled supplies. Place broken ampule vials, used vials, and used needles in a puncture-proof and leak-proof container. Clean the medication work area and perform hand hygiene.

Unexpected Outcomes

Air bubbles remaining in syringe

Incorrect dose prepared

- Proper disposal of glass and needle prevents accidental injury to staff and controls the transmission of infection.

Related Interventions

- Expel air from the syringe and add medication to the syringe until the correct dose is prepared.
- Discard the prepared dose and prepare the corrected new dose.

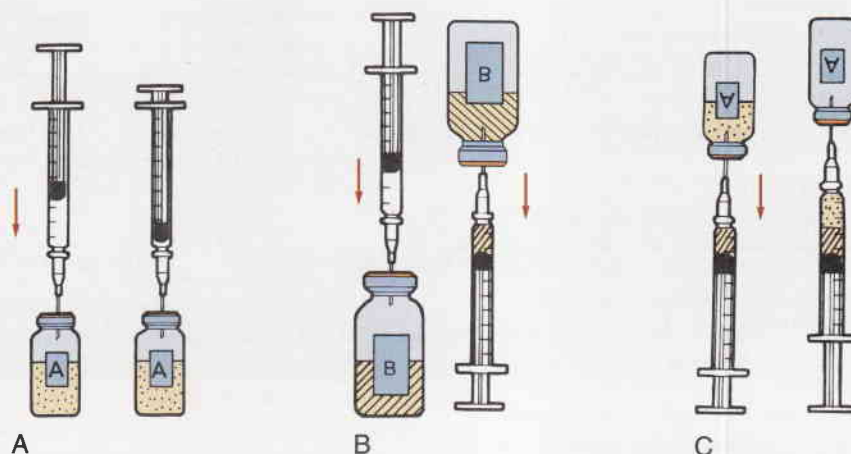


Figure 33-20 Mixing medications from two vials. A, Injecting air into vial A. B, Injecting air into vial B and withdrawing the dose. C, Withdrawing medication from vial A; the two medications are now mixed.

the concentration of medication per millilitre. Multidose vials may require refrigeration after the contents are reconstituted.

Mixing Medications. If two medications are compatible, they can be mixed in one injection if the total dose is within accepted limits. When two or more medications are mixed, the patient will not have to receive more than one injection at a time. Most nursing units keep charts that list common compatible medications. If you have any uncertainty about medication compatibilities, consult a pharmacist.

Mixing Medications From Two Vials. Apply the following principles when mixing medications from two vials:

- Do not contaminate one medication with another.
- Ensure the final dose is accurate.
- Maintain an aseptic technique.

To mix medications from two vials, use only one syringe with a needle or use a syringe with a needleless access device attached (Figure 33-20). Aspirate a volume of air equivalent to the first medication's dose (vial A). Inject the air into vial A, ensuring the needle does not touch the solution. Withdraw the needle and aspirate a volume of air equivalent to the second medication's dose (vial B). Inject the air into vial B. Immediately withdraw the medication from vial B into the syringe, then insert the needle back into vial A, being careful not to push the plunger and expel the medication in the syringe into the vial. Withdraw the desired amount of medication from vial A into the syringe. After withdrawing the necessary amount, withdraw the needle from the syringe. Insert into the syringe a new needle or a needleless access device suitable for injection.

Mixing Medications From One Vial and One Ampule.

When mixing medication from a vial and an ampule, prepare medication from the vial first and then use the same syringe and filter needle to withdraw medication from the ampule. Prepare the medication combination in this order because you do not need to add air to withdraw medication from an ampule.

Insulin Preparation. Insulin is the hormone used to treat diabetes in some patients. Although inhaled insulin has recently been approved for use, insulin is most commonly administered by injection. Because insulin is a protein, if it were taken orally, it would break down and be destroyed in the gastrointestinal tract. Most patients who have diabetes that requires them to take insulin learn to self-administer the injections. In Canada, health care providers usually prescribe insulin in concentrations of 100 units per millilitre of solution, which is called U-100 insulin. Insulin is also commercially available in concentrations of 500 units per millilitre of solution, which is called U-500 insulin. U-500 insulin is five times as strong as U-100 insulin and is used only in rare cases when patients are very resistant to insulin (American Diabetes Association [ADA], 2004).

Use the correct syringe when preparing insulin. For example, use a 100-unit insulin syringe to prepare U-100 insulin. Because no syringe is currently designed to prepare U-500 insulin, medication errors can result when preparing U-500 insulin. The Institute for Safe Medication Practices (2002) recommends that prescribers specify the units and volume (e.g., 150 units, 0.3 mL of U-500 insulin) and that nurses use tuberculin syringes to

► TABLE 33-10 A Comparison of Insulin Preparations

Type of Insulin	Onset	Peak	Duration
Rapid-Acting and Short-Acting (Clear)			
Insulin glulisine (Apidra)	10–15 minutes	1–1.5 hours	3–5 hours
Insulin lispro (Humalog)	10–15 minutes	1–2 hours	3.5–4.75 hours
Insulin aspart (NovoRapid)	10–15 minutes	1–1.5 hours	3–5 hours
Regular insulin (short-acting) insulin* (Humulin-R, Novolin ge Toronto)	30 minutes	2–3 hours	6.5 hours
Intermediate-Acting (Cloudy)			
Isophane insulin suspension (Novolin ge NPH insulin, Humulin N)	3–4 hours	6–12 hours	18–28 hours
Long-Acting (Clear)			
Insulin glargine (Lantus) [†]	90 minutes	Plateau	24 hours
Insulin detemir (Levemir) [†]	90 minutes	“Peakless”	16–24 hours
Premixed insulins (Cloudy)			
Premixed regular insulin—NPH (Humulin 30/70, Novolin ge 30/70, 40/60, 50/50)	30–60 minutes	2–12 hours	18–24 hours
Premixed insulin analogues	30–60 minutes	2–12 hours	18–24 hours
• Biphasic insulin aspart (NovoMix 30) • Insulin lispro/lispro protamine (Humalog Mix25 and Mix50)			

*Regular insulin is the only insulin for intravenous use; when administered intravenously, the onset of action is within 10 to 30 minutes and the peak effect is within 20 to 30 minutes.

[†]Cannot be mixed with other insulins.

Based on Canadian Diabetes Association. (2008). Clinical practice guidelines for the prevention and management of diabetes in Canada. Retrieved from <http://www.diabetes.ca/for-professionals/resources/2008-cpg/>

draw up doses of U-500 insulin. When U-500 insulin is ordered, the following medication calculation must be performed to correctly prepare the insulin:

$$\frac{\text{Dose ordered/Dose on hand} \times \text{Amount on hand}}{\text{Amount to administer}}$$

Example: Mr. Dobbs is ordered 250 units of U-500 insulin.

$$\frac{250 \text{ units ordered}/500 \text{ units of insulin on hand} \times 1 \text{ mL}}{= 0.5 \text{ mL to administer}}$$

Therefore, you need to prepare and administer 0.5 mL of U-500 insulin in a tuberculin syringe.

Insulin is classified by its rate of action: rapid-acting, short-acting, intermediate-acting, or long-acting. Each type has a different onset, peak, and duration of action (Table 33-10). Only regular (short-acting) insulin can be administered intravenously. Orders for insulin injections attempt to imitate the normal pattern of a patient's insulin release from the pancreas. Some insulins come in a stable premixed solution (e.g., “30/70 insulin” comprises 30% regular or short-acting insulin to 70% NPH [neutral protamine Hagedorn] or intermediate-acting insulin). Patients receiving premixed insulins do not need to mix insulins.

A patient with diabetes may require more than one type of insulin. For example, by receiving both a short-acting insulin and an intermediate-acting insulin, a patient receives a more sustained control of blood glucose levels over 24 hours.

Insulin is ordered either by a specific dose at select times or by a sliding scale. A sliding scale dictates a certain dose on the basis of the patient's blood glucose level (Box 33-22). Usually, rapid-acting or short-acting insulins are used for sliding scales.

► BOX 33-22 Example of a Sliding Scale Insulin Order

Give regular insulin subcutaneously:

2 units for glucose 11.1–13.3 mmol/L

4 units for glucose 13.4–13.8 mmol/L

6 units for glucose 13.9–16.7 mmol/L

For glucose greater than 16.8 mmol/L, call physician

Before drawing up the insulin doses, gently roll all cloudy insulin preparations between the palms of the hands (or rotate the vial for at least one minute) to resuspend the insulin. Do not shake insulin vials; shaking causes the formation of bubbles, which take up space in the syringe and thereby alter the dose. If more than one type of insulin is required to manage the patient's diabetes, you can mix two different types of insulin in one syringe if they are compatible (Box 33-23), by following the steps demonstrated in Figure 33-20. When two types of insulin are mixed, the single injection minimizes the patient's discomfort that is associated with multiple injections. In hospitals, when you need to take capillary blood samples for blood glucose monitoring, always swab the patient's anticipated sample site (e.g., the fingertip) with an alcohol swab before taking the sample. Use of an aseptic technique prevents the introduction of microorganisms and protects patients from infection while in the hospital. Although diabetic patients are commonly educated not to use alcohol swabs in the home care setting, their use is essential to maintain asepsis and infection control standards in hospital settings. Always consult with agency protocol for special care required when treating diabetic patients.

► BOX 33-23 Procedural Guideline

Mixing Two Kinds of Insulin in One Syringe

Delegation Considerations:

The mixing of two kinds of insulin in one syringe cannot be delegated.

Equipment:

- Insulin vials
- Insulin syringe
- Alcohol swabs
- Medication administration report (MAR) or computer printout

Procedure:

1. Check the accuracy and completeness of each MAR or computer printout against the prescriber's original medication order. Check the patient's name and the medication name, dosage, route, and time for administration. Copy or rewrite any portion of the MAR that is difficult to read.
2. Carefully verify the insulin labels; compare the medication labels against the MAR before preparing the dose to ensure the correct type of insulin is prepared.
3. Perform hand hygiene.
4. If the insulin is cloudy, roll the bottle of insulin between your hands to resuspend the insulin preparation.
5. Wipe the tops of both insulin vials with the alcohol swabs.
6. Verify the insulin dosage against the MAR a second time.
7. If mixing rapid- or short-acting insulin with intermediate- or long-acting insulin, take the insulin syringe and aspirate a volume of air equivalent to the dose of insulin to be withdrawn from the intermediate- or long-acting insulin first. If two intermediate- or long-acting insulins are mixed, either vial can be prepared first.
8. Insert the needle and inject air into the vial of the intermediate- or long-acting insulin. Do not let the tip of the needle touch the insulin.
9. Remove the syringe from the vial of the intermediate- or long-acting insulin without aspirating the insulin.
10. With the same syringe, inject a volume of air that is equivalent to the dose of insulin to be withdrawn into the vial of the rapid- or short-acting insulin. Withdraw the correct dose into the syringe.
11. Remove the syringe from the rapid- or short-acting insulin vial after carefully removing air bubbles in the syringe to ensure the correct dose.
12. After verifying the insulin dosage with the MAR a third time, show the insulin preparation in the syringe to another nurse to verify the correct dose of insulin was prepared. Determine which point on the syringe scale represents the total of the combined units of insulin by adding the number of units of both insulins together (e.g., 3 units regular insulin + 10 units NPH insulin = 13 units total insulin).
13. Place the needle of the syringe back into the vial of the intermediate- or long-acting insulin. Be careful not to push the plunger, which would inject the insulin in the syringe into the vial.
14. Invert the vial, and carefully withdraw the desired amount of insulin into the syringe.
15. Withdraw the needle and check the fluid level in the syringe. Keep the needle of the prepared syringe sheathed or capped until you are ready to administer the medication. Show the syringe to another nurse to verify the correct dose was prepared.
16. Dispose of soiled medication supplies in the proper receptacle and perform hand hygiene.
17. Because rapid- or short-acting insulin binds with intermediate- or long-acting insulin, which reduces the action of the faster-acting insulin, administer the mixture within five minutes of preparing it.

Source: Adapted from the Canadian Diabetes Association. (n.d.). *Insulin: Things you should know*. Retrieved from <http://www.diabetes.ca/files/Insulin.pdf>; and American Diabetes Association. (2004). Insulin administration: Position statement. *Diabetes Care*, 27(15), S106–S109.

Administering Injections

Each injection route differs depending on the type of tissues the medication enters. The characteristics of the tissues influence the rate of medication absorption and thus the onset of medication action. Before injecting a medication, know the volume of the medication to administer, the medication's characteristics and viscosity, and the location of anatomical structures underlying the injection sites (Skill 33-5).

If you do not administer injections correctly, negative patient outcomes can result. Failure to select an injection site in relation to anatomical landmarks can result in nerve or bone damage during needle insertion. An inability to maintain stability of the needle and syringe unit can result in pain for the patient and possible tissue damage. If you fail to aspirate the syringe before injecting an intramuscular medication, the medication may accidentally be injected directly into an artery or vein. Injecting too large a volume of medication for the site selected causes the patient extreme pain and may result in local tissue damage.

Many patients, particularly children, fear injections. Patients with serious or chronic illness often are given several injections daily. You may be able to minimize the patient's discomfort in the following ways:

- Use a sharp-bevelled needle in the smallest suitable length and gauge.

- Position the patient as comfortably as possible, to reduce muscular tension.
- Select the proper injection site, by using anatomical landmarks.
- Divert the patient's attention from the injection by asking open-ended questions.
- Insert the needle quickly and smoothly to minimize tissue pulling.
- Hold the syringe steady while the needle remains in the tissues.
- Inject the medication slowly and steadily.

Subcutaneous Injections. Subcutaneous injections involve administering medications into the loose connective tissue under the dermis (see Skill 33-6, page 727). Because subcutaneous tissue is not as richly supplied with blood as the muscles, medication given by subcutaneous injection is absorbed more slowly than medication given by IM injections; however, medications injected subcutaneously are absorbed completely if the patient's circulatory status is normal. Because subcutaneous tissue contains pain receptors, the patient may experience some discomfort.

The best subcutaneous injection sites are the outer posterior aspect of the upper arms, the abdomen from below the costal margins to the iliac crests, and the anterior aspects of the thighs

Text continued on p. 730

► SKILL 33-5 Administering Injections

**Delegation Considerations**

The administration of injections cannot be delegated to an unregulated care provider (UCP). Instruct UCPs to report the occurrence of potential medication side effects or any changes in the patient's vital signs or level of consciousness (e.g., sedation) immediately.

Equipment

- Proper size syringe and needle:
- *Subcutaneous*: Syringe (1–3 mL) and needle (25–27 gauge, 1–1.6 cm)
- *Subcutaneous U-100 insulin*: Insulin syringe (0.3, 0.5, or 1 mL) with preattached needle (28–31 gauge)
- *IM*: Syringe 2–3 mL for adult, 0.5–1 mL for infants and small children
- Needle, with length corresponding to the site of injection and the age of the patient according to the following guidelines (Nicoll & Hesby, 2002):
- *Any site (children)*: 1.6–3.2 cm (depending on the size of the child)
- *Vastus lateralis (adults)*: 2.5–3.8 cm
- *Deltoid (adults)*: 2.5–3.8 cm
- *Ventrogluteal (adults)*: 3.8 cm
- *Intradermal and subcutaneous U-500 insulin*: 1 mL tuberculin syringe with preattached 26- or 27-gauge needle
- Small gauze pad, or alcohol swab, or both
- Vial or ampule of medication or skin test solution
- Clean gloves
- Medication administration record (MAR) or computer printout

Procedure**STEPS****For All Injections**

1. Check the accuracy and completeness of each MAR or computer printout against the prescriber's original medication order. Check the patient's name and the medication name, route, dosage, and time of administration. Copy or rewrite any portion of the MAR that is difficult to read.
2. Assess the patient's medical history, medication history, and history of allergies. Determine whether the patient is allergic to any substances and the normal allergic reaction experienced.
3. Check the date of expiration for the medication.
4. Observe the patient's verbal and nonverbal responses to receiving the injection.
5. Assess the patient for contraindications.
 - A. For subcutaneous injections:
Assess the patient for factors such as circulatory shock and reduced local tissue perfusion. Assess the adequacy of the patient's adipose tissue.
 - B. For intramuscular injections:
Assess the patient for muscle atrophy, reduced blood flow, and circulatory shock.

RATIONALE

- The order sheet is the most reliable source and only legal record of printout against the prescriber's original medication order. Check the MAR and the original medication order to ensure the patient receives the correct medications. Illegible MARs are a source of medication errors.
- Certain substances have similar compositions; never administer a substance to which a patient has a known allergy.
- Drug potency may increase or decrease when medications are expired.
- Injections can be painful. Some patients have anxiety, which can increase their experience of pain.
- Reduced tissue perfusion interferes with medication absorption and distribution. Physiological changes of aging and the patient's health may affect the amount of the patient's subcutaneous tissue. The amount of subcutaneous tissue influences the methods chosen for administering injections.
- Atrophied muscles absorb medication poorly. Factors that interfere with blood flow to muscles will impair the medication's absorption.

Critical Decision Point: Because of documented adverse effects to intramuscular injections, other routes of medication administration are safer. Verify that an intramuscular injection is necessary and explore alternative medication routes if possible (Nicoll & Hesby, 2002; World Health Organization [WHO], 2005).

6. Aseptically prepare the correct medication dose from an ampule or vial (see Skill 33-3). Ensure all air is expelled from the syringe. Check the label of medication against the MAR three times while preparing the medication. Create a removable label that shows the patient's name, the name of the drug, and the dosage. Apply the label to the removable needle cap.
 7. Take the medication to the patient at the right time and perform hand hygiene.
- Aseptic preparation ensures that the medication is sterile. Preparation techniques differ for ampules and vials. Checking the label against the MAR ensures the right medication is prepared for the right patient.
 - Taking the medication according to schedule ensures the patient receives the effect of the medication at the right time. Hand hygiene reduces the transfer of microorganisms.

► SKILL 33-5 Administering Injections—cont'd



8. Close the room curtain or door.
 9. Identify the patient using at least two patient identifiers. Compare the patient's name and one other identifier (e.g., the hospital identification number) on the MAR, computer printout, or computer screen against information on the patient's identification bracelet. Ask the patient to state his or her name if possible, for a third identifier.
 10. Compare the label on the medication with the MAR one more time at the patient's bedside.
 11. Describe the steps of procedure and inform the patient that the injection will cause a slight burning or stinging sensation.
 12. Perform hand hygiene; put on disposable gloves.
 13. Keep a sheet or gown draped over the patient's body parts that do not need to be exposed.
 14. Select an appropriate injection site. Inspect the skin surface over the injection site for bruises, inflammation, and edema.
 - A. *Subcutaneous injection*: Palpate the injection site for masses or tenderness. Avoid these areas. For patients who require daily insulin, rotate the injection site daily. Ensure the needle is the correct size by grasping a skin fold at the injection site with your thumb and forefinger. Measure across the skin fold. The needle should be one-half the distance across the fold to give it at a 90-degree angle.
 - B. *Intramuscular injection*: Note the integrity and size of the muscle and palpate for tenderness or hardness. Avoid these areas. If injections are given frequently, rotate the injection sites. Use the ventrogluteal site if possible.
 - C. *Intradermal injection*: Note any lesions or discolourations of the patient's forearm. Select an injection site three to four fingerwidths below the antecubital space and a handwidth above the wrist. If the forearm cannot be used, inspect the patient's upper back. If necessary, sites for subcutaneous injections may be used.
 15. Assist the patient to a comfortable position:
 - A. *Subcutaneous injection*: Have the patient relax the arm, leg, or abdomen, depending on the site chosen for injection.
 - B. *Intramuscular injection*: Position the patient depending on the site chosen (e.g., have the patient sit, lie flat, lie on one side, or lie prone).
 - C. *Intradermal injection*: Have the patient extend the elbow and support the elbow and forearm on a flat surface.
 - D. Speak with the patient about a subject of interest. Ask open-ended questions.
- Closing the curtain or door provides privacy and avoids distractions.
 - This process complies with the Joint Commission's (2007) requirements and improves medication safety. In most acute care settings, the name and identification number on the patient's armband and the MAR are used to identify patients. Identification bracelets are made at the time of the patient's admission and are the most reliable source of information. The patient's room number is *not* an acceptable identifier.
 - The final check of medication labels against the MAR at the patient's bedside reduces medication administration errors.
 - Describing the process to the patient helps to minimize the patient's anxiety.
 - Hand hygiene and the wearing of gloves reduces the transfer of microorganisms.
 - Use of a sheet or gown respects the dignity of the patient while only the area to be injected is exposed.
 - Injection sites should be free of abnormalities that may interfere with medication absorption. Injection sites that are used repeatedly can become hardened from lipohypertrophy (increased growth in fatty tissue). Do not inject an area that is bruised or shows signs associated with infection.
 - Subcutaneous injections can be inadvertently given in the muscle, especially when the injection site is in the abdomen or thigh (Annersten & Willman, 2005). Use of the appropriate size of needle ensures that medication will be injected in the subcutaneous tissue (Hunter, 2008; King, 2003).
 - Unless contraindications exist for this site, the ventrogluteal site is the preferred injection site for adults and children but for infants the vastus lateralis site should be used. (Cook & Murtagh, 2006; Hockenberry & Wilson, 2007; Nicoll & Hesby, 2002; Small, 2004).
 - An intradermal site should be free from lesions or discolourations so that results of skin test can be seen and interpreted correctly.
 - Relaxation of the injection site minimizes the patient's discomfort.
 - The position of the patient can reduce strain on the patient's muscle and minimize the discomfort of the injection.
 - The position of the patient stabilizes the injection site for easy accessibility.
 - Distraction reduces anxiety.
 - Injection into the correct anatomical site prevents injury to nerves, bones, and blood vessels.

Critical Decision Point: Ensure the patient's position is not contraindicated by a medical condition.

16. Relocate the injection site using anatomical landmarks.
- Injection into the correct anatomical site prevents injury to nerves, bones, and blood vessels.

Continued

► SKILL 33-5 Administering Injections—cont'd

video

17. Clean the injection site with an antiseptic swab. Touch the swab to the centre of the site and rotate outward in a circular direction for about 5 cm (see Step 17 illustration).
18. Hold the swab or gauze between the third and fourth fingers of your nondominant hand.
19. Remove the needle cap or sheath from the needle by pulling it straight off.
20. Hold the syringe between the thumb and forefinger of your dominant hand.
 - A. *Subcutaneous injection:* Hold the syringe as if you were holding a dart, palm down; or hold the syringe across the tops of your fingertips (see Step 20A illustration).

- The mechanical action of the swab removes secretions containing microorganisms.
- The gauze or swab is readily accessible when the needle is withdrawn.
- Preventing the needle from touching the sides of the cap avoids the risk of contamination.
- Quick, smooth injection requires proper manipulation of the syringe parts.



Step 17 Clean the injection site by using a circular motion.



Step 20A Hold the syringe as if grasping a dart.

- B. *Intramuscular injection:* Hold the syringe as if you were holding a dart, palm down.
- C. *Intradermal injection:* Hold the bevel of the needle pointing up.
21. Administer the injection:
 - A. *Subcutaneous injection*
 - (1) For an average-sized patient, spread the skin tightly across the injection site or pinch the skin with your nondominant hand.
 - (2) Inject the needle quickly and firmly at a 45- to 90-degree angle. Hold the skin fold until the needle has been withdrawn from the skin (Frid et al., 2010).
 - (3) For an obese patient, pinch the skin at the injection site and insert the needle at a 90-degree angle below the tissue fold.

- With the bevel pointing up, the medication is less likely to be deposited into tissues below dermis.
- The needle penetrates tight skin easier than loose skin. Pinching the skin elevates the subcutaneous tissue and may desensitize the area.
- Quick, firm insertion minimizes the patient's discomfort. (Injecting medication into compressed tissue irritates the nerve fibres.) Injecting at the correct angle prevents accidental injection into the muscle. Injecting into a raised skin fold is thought to result in a more diffuse depot of insulin, in contrast to a compact bolus injected without a pinch up (King, 2003).
- It is important to ensure that the injection is given in the subcutaneous adipose tissue rather than intradermally (just under the epidermis) or into the muscle (Hunter, 2008).

Critical Decision Point: Piercing a blood vessel during a subcutaneous injection is very rare, so aspiration is not necessary when administering subcutaneous injections.

► SKILL 33-5 Administering Injections—cont'd**video**

- (4) Inject the medication slowly (see Step 21A(4) illustration).



Step 21A (4) Inject the medication slowly.

B. Intramuscular injection

- (1) Position your nondominant hand at the proper anatomical landmarks and pull the skin down approximately 2.5–3.5 cm or laterally with the ulnar side of your hand to administer the injection in a Z-track. Hold this position until the medication is injected. Use your dominant hand to insert the needle quickly at a 90-degree angle into the muscle.
 - (2) If the patient's muscle mass is small, grasp a body of muscle between your thumb and fingers.
 - (3) After the needle pierces the skin, grasp the lower end of the syringe barrel with your nondominant hand to stabilize the syringe. Continue to hold the skin tightly with your nondominant hand. Move your dominant hand to the end of the plunger. Do not move the syringe.
 - (4) Pull back on the plunger. If no blood appears, inject the medicine slowly, at a rate of 1 mL per 10 seconds.
- The Z-track creates a zigzag path through the tissues to seal the needle track and avoid tracking of the medication. The Z-track should be used for all intramuscular injections (smaller needles may be needed for smaller muscles) (Beyea & Nicoll, 1995; Nicoll & Hesby, 2002).
 - Grasping the muscle ensures the medication reaches the muscle mass (Hockenberry & Wilson, 2007).
 - Smooth manipulation of the syringe reduces the patient's discomfort from needle movement. The skin must remain pulled until after the drug is injected to ensure Z-track administration.
 - Aspiration of blood into the syringe indicates intravenous placement of the needle. A slow injection rate reduces the chance of pain and tissue trauma (Nicoll & Hesby, 2002).

Critical Decision Point: If blood appears in the syringe, remove the needle and dispose of the medication and syringe properly. Prepare another dose of medication for injection.

- (5) Wait 10 seconds, and then smoothly and steadily withdraw the needle and release the skin. Apply gentle pressure with dry gauze if desired.
- A wait of 10 seconds allows time for the medication to absorb into the muscle before you remove the syringe and prevents the medication from leaking back out through the track created by the needle (Nicoll & Hesby, 2002).

C. Intradermal injection

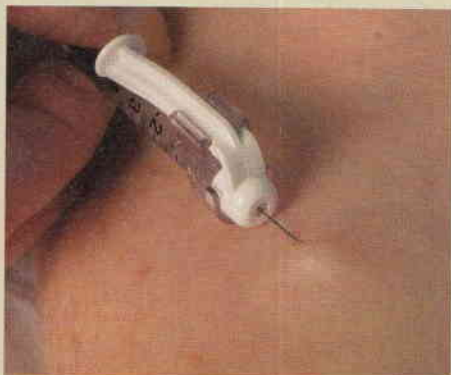
- (1) With your nondominant hand, stretch the skin over the injection site with your forefinger or thumb.
 - (2) With the needle almost against the patient's skin, insert it slowly with the bevel pointed up at a 5- to 15-degree angle until resistance is felt. Advance the needle through the epidermis to approximately 3 mm below the skin surface. The needle tip can be seen through skin.
- The needle pierces tight skin more easily than loose skin.
 - This technique ensures the needle tip is in the dermis.

Continued

► SKILL 33-5 Administering Injections—cont'd



- (3) Inject the medication slowly. Normally, resistance is felt. If resistance is not felt, the needle is in too deep; remove and begin again. Your nondominant hand can stabilize the needle during the injection.
- (4) While injecting medication, notice that a small bleb of approximately 6 mm in diameter (resembling a mosquito bite) appears on the skin's surface (see Step 21C [4] illustration). Instruct the patient that this bleb is a normal finding.



Step 21C (4) The injection creates a small bleb.

22. Withdraw the needle while wiping an alcohol swab or gauze gently over the injection site.
 23. Apply gentle pressure. Do not massage the injection site. Put on a bandage if needed.
 24. Assist the patient to a comfortable position.
 25. Discard into a puncture- and leak-proof receptacle the uncapped needle or the needle enclosed in safety shield and attached to the syringe. Do *not* recap the needle.
 26. Remove disposable gloves and perform hand hygiene.
 27. Stay with the patient for 3–5 minutes to observe for any allergic reactions.
 28. Periodically return to the patient's room to ask whether the patient feels any acute pain, burning, numbness, or tingling at the injection site.
 29. Inspect the injection site, noting any bruising or induration.
 30. Observe the patient's response to medication at times that correlate with the medication's onset, peak, and duration.
 31. Ask the patient to explain the purpose and effects of the medication.
 32. For intradermal injections, use a skin pencil and draw a circle around the perimeter of the injection site. Read the site within an appropriate amount of time, which is determined by the type of medication or skin test administered.
- Slow injection minimizes the discomfort at the injection site. The dermal layer is tight and does not expand easily when the solution is injected. Stabilizing the needle prevents unnecessary movements and decreases the patient's discomfort.
 - The bleb indicates the medication is deposited in the dermis.
 - Support of tissue around the injection site minimizes the patient's discomfort during withdrawal of the needle. Dry gauze may minimize the patient's discomfort associated with the use of alcohol on nonintact skin.
 - Massage may cause underlying tissue damage. Massage of the intradermal site may disperse the medication into underlying tissue layers and thereby alter the test results.
 - Helping the patient to a comfortable position gives the patient a sense of well-being.
 - Proper needle disposal prevents injury to patients and health care personnel. Recapping the needle increases the risk of needle-stick injury (Health Canada, 1997).
 - Proper hygiene reduces the transmission of microorganisms.
 - Severe anaphylactic reaction is characterized by dyspnea, wheezing, and circulatory collapse and is a life-threatening emergency.
 - Continued discomfort may indicate injury to underlying bones or nerves.
 - Bruising or induration indicates a complication associated with the injection. Document your findings and notify the patient's health care provider. Provide a warm compress to the site.
 - Intramuscular medications are rapidly absorbed. Adverse effects of parenteral medications may develop rapidly. Your observations evaluate the efficacy of the medication action.
 - Questioning the patient will help to evaluate the patient's understanding of the information you have taught.
 - The pencil mark makes the injection site easy to find. Results of skin testing are read at various times, on the basis of the type of medication used or the type of skin test completed. Refer to the manufacturer's directions to determine when to read the test's results.

Unexpected Outcomes

Raised, reddened, or hard zone (induration) around intradermal test site

Related Interventions

- Notify the patient's health care provider.
- Document the patient's sensitivity to the injected allergen or the positive test if tuberculin skin testing was completed.

► SKILL 33-5 Administering Injections—cont'd

Hypertrophy of skin, resulting from repeated subcutaneous injections

Signs and symptoms of allergy or side effects

Complaints of localized pain, numbness, tingling, or burning sensation at injection site, indicating possible injury to nerve or tissues

- Do not use this site for future injections.
- Instruct patient not to use the injection site for 6 months.
- Follow the institutional policy or guidelines for the appropriate response to adverse drug reactions.
- Notify the patient's health care provider immediately.
- Add allergy information to the patient's medical record.
- Assess the injection site.
- Document your findings.
- Notify the patient's health care provider.

Recording and Reporting

- Chart the medication dose, route, site, time, and date of injection on the MAR immediately after giving medication, as per agency policy.
- Document if the scheduled medication is withheld and record the reason as per agency policy.
- Report any undesirable effects from the medication to the prescriber.
- Record the patient's response to medications in the nurses' notes and report to prescriber if required.

Home Care Considerations

- Assess the patient's readiness to learn before instructing him or her on how to administer self-injections. Some patients are hesitant to administer injections to themselves; relieve any anxiety before teaching this skill to a patient.
- Patients can often purchase or obtain sharps boxes for home use. If this purchase is not feasible, a hard plastic bottle that is nontransparent (e.g., a fabric softener bottle or a detergent bottle) may be used to safely store syringes after use. Disposal of needles used in the home varies among communities. Check with local authorities to verify how to appropriately dispose of needles.

► SKILL 33-6 Adding Medications to Intravenous Fluid Containers**Delegation Considerations**

Adding medications to IV fluid containers cannot be delegated to unregulated care providers (UCPs). (In some institutions, the pharmacist may add medications to the primary containers of IV solutions to promote safe medication administration and ensure asepsis.)

Equipment

- Vial or ampule of prescribed medication
- Syringe of appropriate size (5–20 mL)
- Sterile needle (2.5–3.8 cm, 19–21 gauge) with special filters (if required)
- Diluent as indicated (e.g., sterile water, normal saline)
- Sterile IV fluid container (bag or bottle, 25–1000 mL in volume)
- Alcohol or antiseptic swab
- Label to attach to IV bag or bottle
- Medication administration record (MAR) or computer printout

Procedure**STEPS****RATIONALE**

1. Check the accuracy and completeness of each MAR or computer printout against the prescriber's original medication order. Check the patient's name and the medication name, route, dosage, and time of administration. Copy or rewrite any portion of the MAR that is difficult to read.
2. Assess the patient's medical history.
3. Collect information necessary to administer the drug safely, including the medication's action, purpose, side effects, normal dose, time of peak onset, and nursing implications.
4. When more than one medication is to be added to the IV solution, assess for compatibility of the medications.
5. Assess the patient's systemic fluid balance, as evidenced by skin hydration and turgor, body weight, pulse, blood pressure, and ratio of fluid intake to urinary output.
6. Assess the patient's history of medication allergies.
7. Perform hand hygiene.
8. Assess the IV insertion site for signs of infiltration or phlebitis (see Chapter 39).

- Medications often are incompatible when mixed together. Chemical reactions that occur result in clouding or crystallization of IV fluids. Check the hospital policy for a list of approved medication compatibilities.
- Continuous IV infusions can lead to fluids that infuse too rapidly, thereby causing circulatory overload, especially in children and older adults (Ebersole et al., 2004; Hockenberry & Wilson, 2007).
- The IV administration of medications causes rapid effects. Allergic response can be immediate.
- An intact, properly functioning site ensures medication is given safely.

Continued

► SKILL 33-6 Adding Medications to Intravenous Fluid Containers—cont'd

9. Assess the patient's understanding of the purpose of the medication therapy.
 10. Prepare the prescribed medication (see Skill 33-4); use aseptic techniques. Ensure that you compare the label of the medication with the MAR two times while preparing the medication.
 11. Perform hand hygiene.
 12. Compare the labels of the medication and the IV fluid bag with the MAR or computer printout.
 13. Add the medication to a new container (usually in the medication room or at medication cart):
 - A. *Solution in a bag:* Locate the medication injection port on the plastic IV solution bag. The port has a small rubber stopper at the end. Do not select the port for the IV tubing insertion or the air vent.
 - B. *Solution in a bottle:* Locate the injection site on the IV solution bottle, which is often covered by a metal or plastic cap.
 - C. Wipe the port or injection site with alcohol or an antiseptic swab (see Step 13C illustration).
 - D. Remove the needle cap or sheath from the syringe and insert the needle of the syringe or the needleless device through the centre of injection port or site; inject the medication (see Step 13D illustration).
- Proper technique ensures the medication is sterile; preparation techniques differ for ampules and vials.
 - Checking the labels ensures the correct medication is injected into the correct IV fluid.
 - The medication injection port is self-sealing to prevent introduction of microorganisms after repeated use.
 - Accidental injection of medication through the main tubing port or the air vent can alter the pressure within the bottle and cause fluid leaks through the air vent. The cap seals the bottle to maintain its sterility.
 - Cleaning the port of injection site reduces the risk of introducing bacteria into the port.
 - Injection of the needle into the sides of the port may cause a leak and lead to fluid contamination.



Step 13C Clean the injection port with an antiseptic swab.



Step 13D Inject the medication through the port.

- E. Withdraw the syringe from the bag or bottle.
 - F. Mix the medication and the IV solution by holding the bag or bottle and turning it gently end to end.
 - G. Complete the medication label by printing the name and dose of the medication, the date and time of administration, and your initials. Apply the label to the bottle or bag, being careful not to cover any essential information preprinted on the bottle or bag. Spike the bag or bottle with the IV tubing.
14. Take the assembled items to the patient's bedside at the right time.
- When the syringe is withdrawn, the injection port self-seals to prevent the introduction of microorganisms.
 - Gently turning the bag or bottle allows even distribution of the medication.
 - The label informs other health care providers of the contents of the bag or bottle.
 - Concealing important information on the IV bag can lead to medication errors.

SKILL 33-6 Adding Medications to Intravenous Fluid Containers—cont'd

15. Identify the patient using at least two patient identifiers. Compare the patient's name and one other identifier (e.g., the hospital identification number) on the MAR, computer printout, or computer screen against information on the patient's identification bracelet. Ask the patient to state his or her name if possible, for a third identifier.

16. Prepare the patient by explaining that the medication is to be given through the existing IV line or a new line that will be started. Explain that no discomfort should be felt during the medication infusion. Encourage the patient to report symptoms of discomfort.

17. Connect the infusion tubing or spike container to the existing tubing. Regulate the infusion at the ordered rate.

- Most IV medications do not cause discomfort when diluted; however, potassium chloride is irritating. Pain at the insertion site may be an early indication of infiltration.

- Properly regulated infusion prevents rapid infusion of fluid.

Critical Decision Point: Some medications (e.g., potassium chloride) can cause serious adverse reactions, including fatal cardiac dysrhythmias. These medications should be infused on an IV pump. Check the institutional guidelines or policies indicating which IV medications require administration on an IV pump.

18. Add the medication to the existing container.

Critical Decision Point: Because you cannot know exactly how much IV fluid remains in an existing hanging IV container, you are unable to determine the exact concentration of the medication in the IV solution. Therefore, it is recommended that medications be added to new IV fluid containers whenever possible.

A. Prepare a vented IV bottle or plastic bag:

(1) Check the volume of the solution remaining in the bottle or bag.

(2) Close off the IV infusion clamp.

(3) Wipe the medication port with an alcohol or antiseptic swab.

(4) Remove the needle cap or sheath from the syringe; insert the syringe needle or needleless device through the injection port and inject the medication.

(5) Withdraw the syringe from the bag or bottle.

(6) Lower the bag or bottle from the IV pole and gently mix the medication and the IV solution by holding the bag or bottle and turning it gently end to end. Rehang the bag or bottle.

B. Complete the medication label and apply it to the unprinted side of the IV solution bag or bottle. Do not cover the imprinted label of the solution.

C. Regulate the infusion to the desired rate. Use an IV pump if indicated.

19. Properly dispose of equipment and supplies. Do not recap the needle or syringe. Discard the specially sheathed needles as a unit with the needle covered.

20. Perform hand hygiene.

21. Observe the patient for signs or symptoms of medication reaction.

22. Observe the patient for signs and symptoms of fluid volume excess.

23. Periodically return to the patient's room to assess the IV insertion site and the rate of infusion.

24. Observe the patient for signs or symptoms of IV infiltration.

25. Ensure that a label is applied to the IV tubing; the label must state the date and time that the IV tubing was opened and must be attached to the IV infusion system. Consult with agency policy regarding frequency of changing the IV tubing.

- Proper minimal volume (see drug insert) is needed to dilute the medication adequately.

- Closing the clamp prevents medication from directly entering the patient's circulation system when it is injected into the bag or bottle.

- Cleaning the port mechanically removes microorganisms that could enter container during needle insertion.

- The injection port is self-sealing and prevents fluid leaks.

- Gently turning the bag or bottle ensures the medication is evenly distributed.

- The label informs other health care providers of the contents of the bag or bottle. Concealing important information on the IV bag can lead to medication errors.

- Proper regulated infusion prevents rapid infusion of fluid.

- Proper disposal of the needle prevents injury to both you and the patient. Capping of needles increases risk of needle-stick injuries.

- IV medications can cause rapid effects.

- Rapid uncontrolled infusion can cause circulatory overload.

- Over time, the IV site may become infiltrated or the needle may become malpositioned. The flow rate may change according to patient's body position or the volume of solution left in the container.

- Infiltrated medications can injure tissue.

- Most agencies have policies indicating that IV tubing should be changed every 72 hours. The frequency of changing IV tubing may increase on the basis of the solution being administered (e.g., antibiotics, or total parental nutrition [TPN]) or the type of in-dwelling IV catheter (e.g., central line). Changing the IV tubing helps to prevent nosocomial infections.

► SKILL 33-6 Adding Medications to Intravenous Fluid Containers—cont'd

26. Assess the IV tubing frequently for integrity and occlusions.

27. Ask the patient to explain the purpose and effects of the medication therapy.

- Disruptions in the integrity of the IV tubing can lead to the patient not receiving the required IV therapy or medication and may lead to infection.

Unexpected Outcomes

Adverse or allergic reaction to medication

Signs of fluid volume overload (e.g., abnormal breath sounds, shortness of breath, intake greater than output)

Swelling, warmth, redness, and tenderness at intravenous site, indicating phlebitis (see Chapter 39)

Coolness, pallor, and swelling at intravenous site, indicating infiltration (see Chapter 39)

Related Interventions

- Follow institutional policy or guidelines for your appropriate response to and reporting of adverse drug reactions.
- Notify the patient's health care provider immediately.
- Add the allergy information to the patient's medical record.
- Assess the patient for compromised circulatory regulation (vital signs, input:output, focused respiratory and cardiac assessments).
- Stop the IV infusion.
- Notify the patient's health care provider immediately.
- Stop IV infusion and discontinue IV.
- Treat the IV site as indicated by institutional policy.
- If continuation of IV therapy is indicated, insert a new IV site.
- Some IV medications are extremely harmful to the subcutaneous tissue.
- Provide IV extravasation care as indicated by institutional policy, or use a medication reference manual or consult a pharmacist to determine the appropriate follow-up care.

Recording and Reporting

- Record the solution and medication added to parenteral fluid on the appropriate form.
- Report any adverse effects to the patient's health care provider, and document adverse effects according to institutional policy.

(Figure 33-21). The site most frequently recommended for heparin injections is the abdomen (Figure 33-22). Other recommended sites are the scapular areas of the upper back and the upper ventral or dorsal gluteal areas. The injection site chosen should be free of skin lesions, bony prominences, and large underlying muscles or nerves.

The administration of low-molecular-weight heparin (LMWH) (e.g., enoxaparin) requires special considerations. The injection site is the right or left side of the abdomen at least 5 cm from the umbilicus. Administer LMWH in its prefilled syringe with the attached needle; do not expel the air bubble in the syringe before giving the medication. The needle should be introduced into a skin fold held between the thumb and forefinger; the skin fold should be held throughout the injection. To minimize bruising, do not rub the injection site after injection (Sanofi-Aventis, 2006).

When giving U-100 insulin, use U-100 insulin syringes with preattached 26- to 31-gauge needles; when giving U-500 insulin, use 1 mL tuberculin syringes (Institute for Safe Medication Practices, 2002). Recommended sites for insulin injections include the upper arm and the anterior and lateral portions of the thigh, buttocks, and abdomen. Patients with diabetes who inject insulin should practise intrasite rotation (rotating injection sites within the same body part) to provide greater consistency in the absorption of insulin. For example, if the morning insulin is injected into the patient's arm, then a subsequent injection should also be given in the arm but at least 2.5 cm away from the previous site. No injection site should be used again for at least one month. The rate of insulin absorption varies depending on the site: the abdomen has

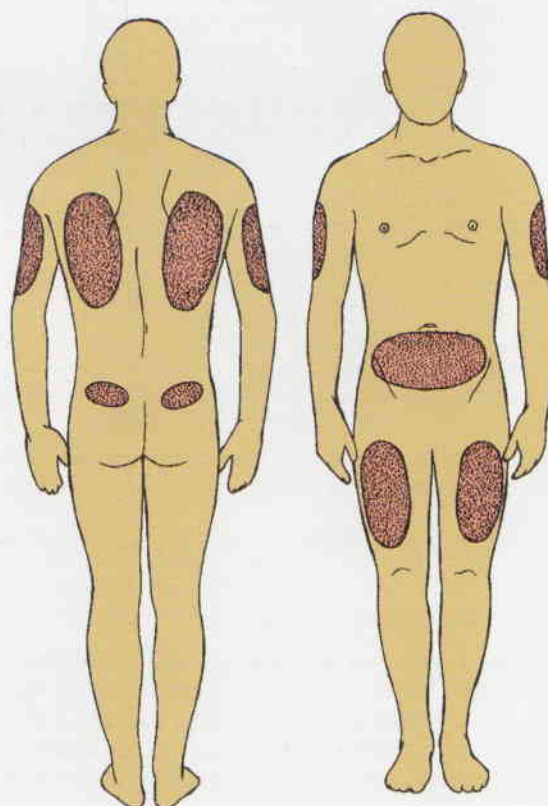


Figure 33-21 Sites recommended for subcutaneous injections.

the quickest absorption, followed by the arms, thighs, and buttocks (American Diabetes Association, 2004; Canadian Diabetes Association, 2008). For subcutaneous injections of insulin, pinch the skin and insert the needle at a 90-degree angle; inject the insulin, then release the pinched skin, count five to six seconds and remove the needle.

Only small doses (0.5 to 1 mL) of water-soluble medications should be given subcutaneously because the tissue is sensitive to irritating solutions and large volumes of medications. Medications can collect within the tissues to cause sterile abscesses, which appear as hardened, painful lumps under the skin.

A patient's body weight indicates the depth of the subcutaneous layer. Therefore, choose the needle length and angle of insertion based on the patient's weight and an estimation of the amount of subcutaneous tissue (Annersten & Willman, 2005). In general, medications can be injected in the subcutaneous tissue of a normal-sized patient using a 25-gauge 1.6 cm needle inserted at a 45-degree angle (Figure 33-23) or a 1.3 cm needle inserted at a 90-degree angle. A child may require only a 1.3 cm needle. If the patient is obese, pinch the tissue and use

a needle long enough to insert through the fatty tissue at the base of the skinfold. The preferred needle length is one-half the width of the skinfold; the angle of insertion may be between 45 and 90 degrees. Thin patients may have insufficient tissue for subcutaneous injections; the upper abdomen is the best injection site for these patients. To ensure a subcutaneous medication reaches the subcutaneous tissue, follow this rule: if you can grasp 5 cm of tissue, insert the needle at a 90-degree angle; if you can grasp 2.5 cm of tissue, insert the needle at a 45-degree angle (Rushing, 2004).

Intramuscular Injections. The intramuscular (IM) route provides faster medication absorption than the subcutaneous route because of a muscle's greater vascularity; however, intramuscular injections are associated with many risks. Therefore, when administering a medication by the intramuscular route, you must first verify that the injection is justified (Nicoll & Hesby, 2002; WHO, 2005). In many cases, such as influenza and pneumonia vaccinations, no alternative routes exist to administer the medication.

Use a longer and heavier-gauge needle to pass through the subcutaneous tissue and penetrate the deep muscle tissue (see Skill 33-5). The patient's body weight and the amount of adipose tissue can influence the selection of a needle size. For example, an obese patient may require a needle 7.5 cm long, whereas a thin patient may require a 1.3 to 2.5 cm needle.

The angle of insertion for an intramuscular injection is 90 degrees (see Figure 33-23). Muscle is less sensitive to irritating and viscous medications. A normal, well-developed patient can tolerate 3 mL of medication into a larger muscle without severe muscle discomfort. A larger volume of medication is unlikely to be absorbed properly. Children, older adults, and thin patients can tolerate only 2 mL of an intramuscular injection. Do not give more than 1 mL to small children and older infants, and do not give more than 0.5 mL to smaller infants (Hockenberry & Wilson, 2007).

Assess the muscle integrity of the selected site before giving an injection. The muscle should be free of tenderness. Repeated injections in the same muscle can cause severe discomfort. Ensure that the patient is relaxed, then palpate the muscle to rule out any hardened lesions. You can minimize discomfort during an injection by helping the patient to assume a position that will help reduce muscle strain. Other interventions, such as distraction and applying pressure to the intramuscular site,



Figure 33-22 Giving subcutaneous heparin in the abdomen.

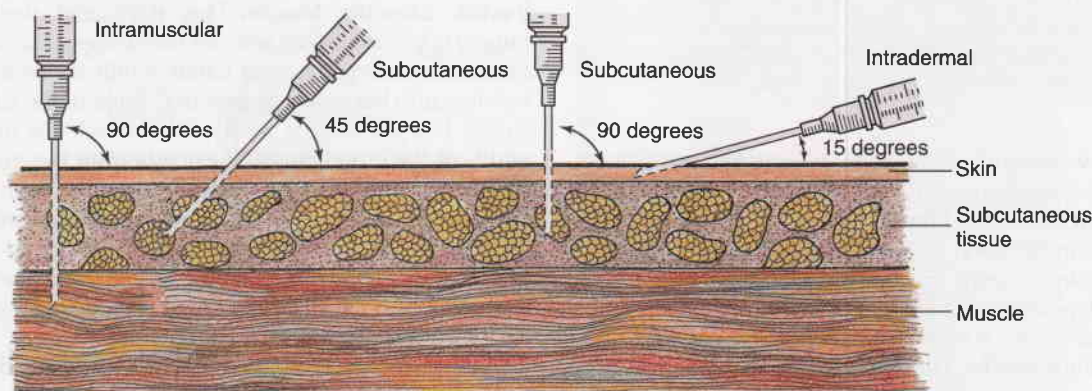


Figure 33-23 Comparison of angles of insertion for intramuscular (90 degrees), subcutaneous (45 and 90 degrees), and intradermal (15 degrees) injections.

BOX 33-24

Characteristics of Intramuscular Sites and Indications for Usage

Vastus Lateralis Muscle

- Lacks major nerves and blood vessels
- Facilitates rapid drug absorption
- Used frequently with infants (younger than 12 months old) receiving immunizations
- May also be used in older children and toddlers receiving immunizations

Ventrogluteal Muscle

- Offers a deep site, situated away from major nerves and blood vessels
- Offers less chance of contamination in incontinent patients and infants
- Identified easily by prominent bony landmarks
- Is preferred site for medications (e.g., antibiotics) that are larger in volume, more viscous, and irritating for adults, children, and infants

Deltoid Muscle

- Is easily accessible but the muscle is not well developed in most patients
- May be used for small amounts of medications
- Not used in infants or children with underdeveloped muscles
- Use of the muscle involves potential for injury to the brachial artery and to the radial and ulnar nerves
- May be used for immunizations of toddlers, older children, and adults
- Recommended site for hepatitis B vaccine and rabies injections

may be used to decrease pain during an intramuscular injection.

Sites. When selecting an intramuscular site, consider the following: Is the area free of infection or necrosis? Do local areas show signs of bruising or abrasions? Where is the location of underlying bones, nerves, and major blood vessels? What volume of medication is to be administered? Each site has certain advantages and disadvantages. The characteristics of each intramuscular site and the indications for use of each site are listed in Box 33-24.

safety alert Researchers who have investigated complications associated with intramuscular injection sites indicate that the ventrogluteal site is the preferred site for most injections administered to adults and children, including infants of any age (Cook & Murtagh, 2006; Hockenberry & Wilson, 2007; Nicoll & Hesby, 2002).

Locate the ventrogluteal muscle by placing the heel of your hand over the greater trochanter of the patient's hip with the wrist perpendicular to the femur. Use your right hand for the left hip, and your left hand for the right hip. Point your thumb toward the patient's groin and point your fingers toward the patient's head; point your index finger to the anterior superior iliac spine, and extend your middle finger back along the iliac crest toward the buttocks. The index finger, the middle finger, and the iliac crest form a V-shaped triangle; the injection site is the centre of the triangle (Figure 33-24). The patient may lie on his or her side or back. Flexing of the knee and hip helps the patient to relax this muscle.

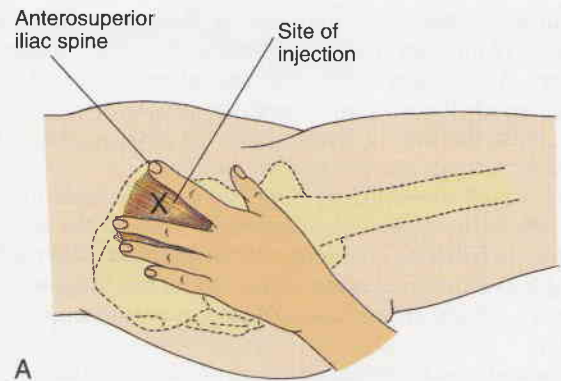


Figure 33-24 A, Landmarks for the ventrogluteal site. B, Giving IM injection in the ventrogluteal muscle.

Ventrogluteal Muscle. The ventrogluteal muscle, which involves the gluteus medius, is situated deep and away from major nerves and blood vessels. It is a safe site for all patients because it is a large muscle that is well developed in adults and young children, including those who do not walk (Nicoll & Hesby, 2002). Research shows that injuries such as fibrosis, nerve damage, abscess, tissue necrosis, muscle contraction, gangrene, and pain have been associated with all of the common intramuscular sites except the ventrogluteal site (Beyea & Nicoll, 1995). The only published case study of a complication at the ventrogluteal site when done correctly reported a local reaction to the medication, which is not a complication associated with the site itself (Nicoll & Hesby, 2002).

Vastus Lateralis Muscle. This thick and well-developed muscle is located on the anterior lateral aspect of the thigh and extends in an adult from a handbreadth above the knee to a handbreadth below the greater trochanter of the femur (Figure 33-25). Use the middle third of the muscle for injection. The width of the muscle usually extends from the midline of the thigh to the midline of the thigh's outer side. When administering injections to young children or cachectic patients, grasp the body of the muscle during injection to ensure the medication is deposited in the muscle tissue. To help relax the muscle, ask the patient to assume a sitting position or to lie flat with leg extended. The vastus lateralis site is often used when infants, toddlers, and children are administered biologicals (e.g., immune globulins, vaccines, or toxoids) (Nicholl & Hesby, 2002).

Dorsogluteal Muscle. In the past, the dorsogluteal muscle has been a traditional site for intramuscular injections. However,

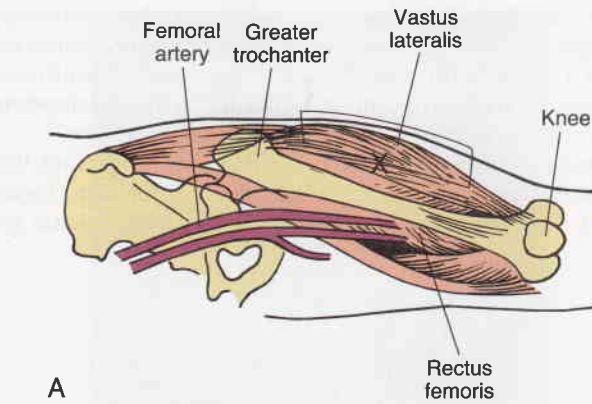


Figure 33-25 A, Landmarks for the vastus lateralis site. B, Giving IM injection in the vastus lateralis muscle.

the exact location of the sciatic nerve varies from one person to another. If a needle hits the sciatic nerve, the patient may experience permanent or partial paralysis of the involved leg. Therefore, do *not* use the dorsogluteal site (Cook & Murtagh, 2006; Nicoll & Hesby, 2002; Small, 2004).

Deltoid Muscle. Although the deltoid site is easily accessible, the muscle is not well developed in many patients. A potential for injury exists when using this site because the axillary, radial, brachial, and ulnar nerves and the brachial artery lie within the upper arm along the humerus (Figure 33-26, A). Use this site only for small medication volumes, when giving immunizations, or when other sites are inaccessible because of dressings or casts (Nicoll & Hesby, 2002).

To locate the deltoid muscle, fully expose the patient's upper arm and shoulder. Do not roll up a tight-fitting sleeve. Have the patient relax the arm at the side and flex the elbow. The patient may sit, stand, or lie down (Figure 33-26, B). Palpate the lower edge of the acromion process, which forms the base of a triangle in line with the midpoint of the lateral aspect of the upper arm. The injection site is in the centre of the triangle, approximately 3 to 5 cm below the acromion process (Nicoll & Hesby, 2002). You may also locate the site by placing four fingers across the deltoid muscle, with your top finger along the acromion process. The injection site is then three fingerwidths below the acromion process.

Technique for Intramuscular Injections. When administering IM injections, the **Z-track method** is recommended because it minimizes local skin irritation by sealing the medication in the muscle tissue. Insert a new needle into the syringe after preparing the medication so that no solution remains on the outside of the needle shaft. For the Z-track technique, select an intramuscular site, preferably in a large, deep muscle, such

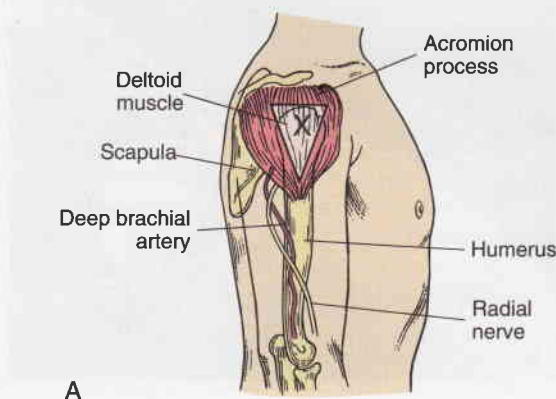


Figure 33-26 A, Landmarks for the deltoid site. B, Giving IM injection in the deltoid muscle.

as the ventrogluteal muscle; smaller needles may need to be used for smaller muscles (Nicoll & Hesby, 2002). After preparing the site with an antiseptic swab, pull the overlying skin and subcutaneous tissues approximately 2.5 to 3.5 cm laterally to the side. Holding the skin taut with your nondominant hand, insert the needle deep into the muscle, and slowly inject the medication if no blood return is observed on aspiration. The needle remains inserted for 10 seconds to allow the medication to disperse evenly rather than channelling back up the track of the needle. Then, withdraw the needle and release the skin. This technique leaves a zigzag path that seals the needle track where the tissue planes slide across each other (Figure 33-27). The medication cannot escape from the muscle tissue. Injections using this technique cause less discomfort and fewer lesions at the injection site (Nicoll & Hesby, 2002).

Intradermal Injections. Intradermal injections are commonly performed for skin testing (e.g., tuberculin screening and allergy tests). Because these medications are potent, they are injected into the dermis, where blood supply is reduced and medication absorption occurs slowly. If the medications enter the circulation too rapidly, a patient may have a severe anaphylactic reaction.

For accurate skin testing, you must be able to see the injection site clearly to detect changes in colour and tissue integrity. Intradermal sites should be lightly pigmented, free of lesions, and relatively hairless. The inner forearm and upper back are ideal locations.

Use a tuberculin or small hypodermic syringe for skin testing. The angle of insertion for an intradermal injection is 5 to 15 degrees (see Figure 33-23), with the bevel of the needle pointed up. As you inject the medication, a small bleb resembling a mosquito bite should appear on the skin's surface (see Skill 33-5). If a bleb does not appear or if the site bleeds after you withdraw the needle, the medication may have entered the subcutaneous tissues. In this case, the test results will not be valid.

Safety in Administering Medications by Injection

Needleless Devices. Needle-stick injuries occur frequently in all health care settings. Some hospitals report that one-third of nursing staff suffer needle-stick injuries each year (Canadian Centre for Occupational Health and Safety [CCOHS], 2005). However, because many workers do not report their injuries, the incidence of needle-stick injuries is probably

higher. Needle-stick injuries commonly occur when needles are recapped, IV lines and needles are mishandled, or needles are left at a patient's bedside. The risk of exposure of health care workers to bloodborne pathogens has led to the development of "needleless devices" or special needle safety devices.

Special syringes are designed with a sheath or guard that covers the needle after it is withdrawn from the skin (Figure 33-28). The needle is immediately covered to eliminate the

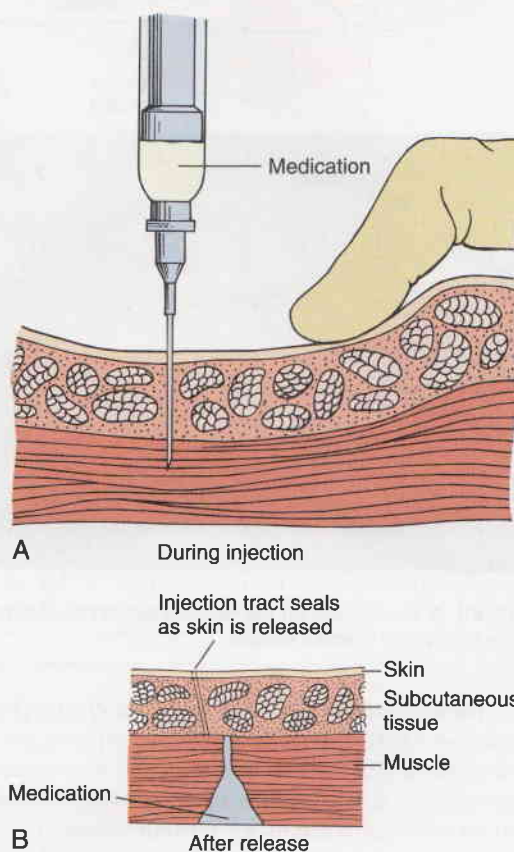


Figure 33-27 A, Pulling on the overlying skin during IM injection moves tissue to prevent later tracking. B, The Z-track left after injection prevents the deposit of medication through sensitive tissue.

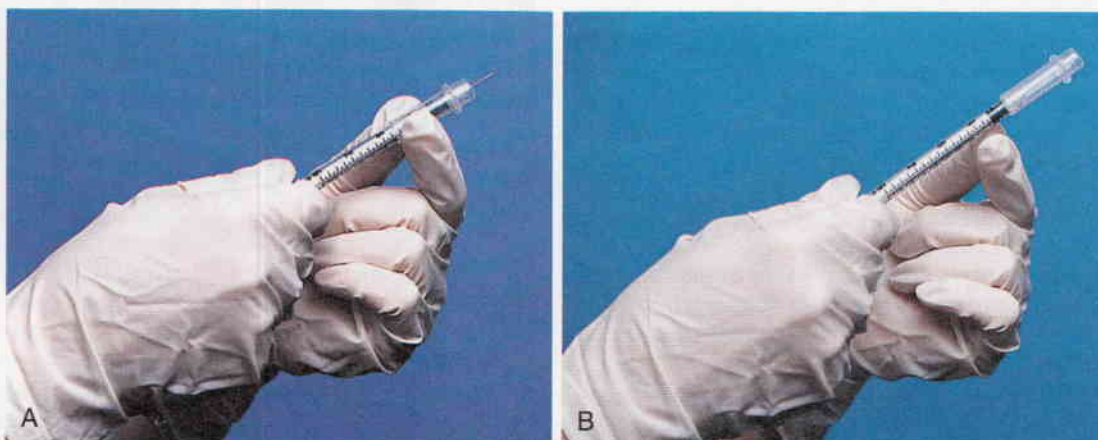


Figure 33-28 Needle with plastic guard to prevent needle sticks. A, Position of guard before injection. B, After injection, the guard locks in place, covering the needle.



Figure 33-29 Sharps disposal using only one hand.

possibility of a needle-stick injury. The syringe and sheath are disposed of together in a receptacle. Needleless devices should be used whenever possible to reduce the risk of injury from needle sticks and sharps (CCOHS, 2005; Health Canada, 1997, 1999; Wilburn & Eijkemans, 2004).

Needles and other instruments that are considered “sharps” are always disposed of into clearly marked containers that are puncture-proof and leak-proof (Figure 33-29). A needle should never be forced into a needle disposable receptacle that is full. Never place used needles and syringes in a wastebasket, in your pocket, on a patient’s meal tray, or at the patient’s bedside. Box 33-25 summarizes recommendations for the prevention of needle-stick injuries.

Intravenous Administration. Medications are administered intravenously by the following methods:

1. As mixtures within large volumes of intravenous fluids
2. By injection of a bolus, or small volume, of medication through an existing intravenous infusion line or intermittent venous access (heparin or saline lock)
3. By “piggyback” infusion of a solution containing the prescribed medication and a small volume of intravenous fluid through an existing intravenous line

In all three methods, the patient has either an existing intravenous infusion line or an intravenous access site (sometime called a heparin or saline lock). In most institutions, policies and procedures list the persons who may give intravenous medications and the situations in which these medications may be given. These policies are based on the medication, capability, and availability of staff, and the type of monitoring equipment available.

Chapter 39 describes the technique for performing venipuncture and establishing continuous intravenous fluid infusions. Medication administration is only one reason for supplying intravenous fluids. Intravenous fluid therapy is used primarily for fluid replacement in patients unable to take

► BOX 33-25 Recommendations for the Prevention of Needle-Stick Injuries

- Avoid using needles when effective needleless systems or sharps with engineered sharps injury protections (SESIP) safety devices are available.
- Never recap needles.
- Never move an exposed needle tip toward an unprotected hand.
- Plan safe handling and safe disposal of needles before beginning the procedure.
- Immediately dispose of needles, needleless systems, and SESIP into puncture-proof disposal containers located near the area of use.
- Maintain occupational health and safety standards that include the following:
 - Assessment and implementation of innovations in procedures and technological developments to reduce risks of exposure to contaminated sharps
 - Employee training to address the risks, hazards, and recommended precautions, and the importance of hepatitis B vaccination where appropriate
 - Documentation of consideration and use of appropriate, commercially available, and effective safer devices
 - Selection of devices that do not jeopardize patient or employee safety and are determined to be medically advisable
 - Documentation of input from employees regarding methods to reduce exposure
 - Annual re-examination of occupational health and safety standards
- Maintain a needle-stick injury reporting protocol that protects the privacy of persons who have had sharps injuries and includes the following information:
 - Type and brand of device involved in the incident
 - Location of the incident (e.g., name of the department or work area)
 - Description of the incident
 - Protection of privacy for both the employee and patient involved in the needle-stick injury

Sources: Data from Canadian Centre for Occupational Health and Safety. (2005). *Needlestick injuries*. Retrieved from http://www.ccohs.ca/oshanswers/diseases/needlestick_injuries.html; Occupational Safety and Health Administration. (2001). *Occupational exposure to bloodborne pathogens: Needlestick and other sharp injuries—Final Rule* (CFR 29, part 1910). Federal Register, 66, 5317; and National Institute for Occupational Safety and Health. (1999). *NIOSH alert: Preventing needle-stick injuries in health care settings* (U.S. Department of Health and Human Services [NIOSH] Publication No. 2000-108). Cincinnati, OH: Author.

oral fluids and as a means of supplying the patient with electrolytes and nutrients.

When using any method of intravenous medication administration, observe patients closely for symptoms of adverse reactions. After a medication enters the bloodstream, it begins to act immediately, and its action cannot be stopped. Thus, take special care to avoid errors in dose calculation and preparation. Carefully follow the 10 rights of safe medication administration, double-check your medication calculations with another nurse, and know the desired action and side effects of every medication that you administer. If the medication has an antidote, it must be available during administration. When administering potent medications, assess the patient’s vital signs before, during, and after infusion.

Administering medications by the intravenous route has advantages. Use the intravenous route in emergencies when a fast-acting medication must be delivered quickly. The intravenous route is also preferred when constant therapeutic blood levels need to be established. Some medications are highly alkaline and irritating to the muscle and subcutaneous tissue. These medications cause less discomfort when given intravenously.

safety alert Because IV medications are immediately available to the bloodstream after they are administered, verify the prescribed rate of administration with a drug reference manual or a pharmacist before giving any IV medication. This step ensures the medication is administered safely over the appropriate amount of time. Patients can experience severe adverse reactions if IV medications are administered too quickly.

Large-Volume Infusions. Of the three methods of administering intravenous medications, mixing medications in large volumes of fluids is the safest and easiest. Medications are diluted in large volumes (500 mL or 1000 mL) of compatible IV fluids, such as normal saline or lactated Ringer's solution (Skill 33-6). In most institutions, the pharmacist adds medications to the primary container of IV solution to ensure asepsis and to reduce the possibility of medication errors. Because the medication is not in a concentrated form, the risk of side effects or fatal reactions is minimal when infused over the prescribed time frame. Vitamins and potassium chloride are two types of medications commonly added to intravenous fluids. However, continuous infusion presents risks: if the intravenous fluid is infused too rapidly, the patient may suffer circulatory fluid overload.

Intravenous Bolus. An intravenous bolus, or "push," involves the introduction of a concentrated dose of a medication directly into the patient's systemic circulation (Skill 33-7). A bolus has the advantage of requiring only a small amount of fluid to deliver the medication; therefore, the bolus is useful when the patient is on restricted fluids. However, an intravenous bolus, or "push," is the most dangerous method for administering medications because you have no time to correct an error. Also, a bolus may cause direct irritation to the lining of the blood vessels. Before administering a bolus, confirm the placement of the IV line by obtaining a blood return through the intravenous catheter or needle. The inability to obtain a blood return suggests that the needle or catheter is in the patient's tissues or is resting against the vein wall. Never give a medication intravenously if the insertion site appears puffy or edematous or if the intravenous fluid cannot flow at the proper rate. Accidental injection of a medication into the tissues around a vein can cause pain, sloughing of tissues, and abscesses, depending on the medication's composition.

Determine the rate of administration of an intravenous bolus medication by the amount of medication that can be given per minute. For example, if a patient is to receive 4 mL of a medication over 2 minutes, give 2 mL of the intravenous bolus medication every minute. Research each medication to determine the recommended concentration and rate of administration. When delivering a medication intravenous push, consider the purpose for which a medication is prescribed and any potential adverse effects related to the rate or route of administration.

Volume-Controlled Infusions. IV medications can also be administered through small amounts (50 to 100 mL) of

compatible IV fluids. The fluid is within a secondary fluid container separate from the primary fluid bag. The container connects directly to the primary IV line or to separate tubing that inserts into the primary line. Three types of containers are volume-control administration sets (e.g., Volutrol or Pediatrol): piggyback sets, tandem sets, and mini-infusors. The use of volume-controlled infusions has several advantages:

- The risk of rapid-dose infusion by IV push is reduced. Medications are diluted and infused over longer time intervals (e.g., 30 to 60 minutes).
- Medications that are stable for only a limited time in solution (e.g., antibiotics) can be administered.
- IV fluid intake can be controlled.

Volume-Control Administration. Volume-control administration (e.g., Volutrol, Buretrol, Pediatrol) sets are small (50 to 150 mL) containers that attach just below the primary infusion bag or bottle. The set is attached and filled in a manner similar to the procedure used with a regular intravenous infusion; however, the priming or filling of the set is different and depends on the type of filter (floating valve or membrane). A Buretrol or Volutrol is used to deliver IV fluids in a safe manner to children in many agencies even when infusion pumps are used. Follow package directions for priming sets (see Chapter 39).

Piggyback. A piggyback is a small (25 to 250 mL) IV bag or bottle that connects to short tubing lines that, in turn, connect to the upper Y-port of a primary infusion line or to an intermittent venous access (Figure 33-30). The piggyback tubing is a microdrip or macrodrip system (see Chapter 39). The set is called a piggyback because the small bag or bottle is set higher than the primary infusion bag or bottle. In the piggyback

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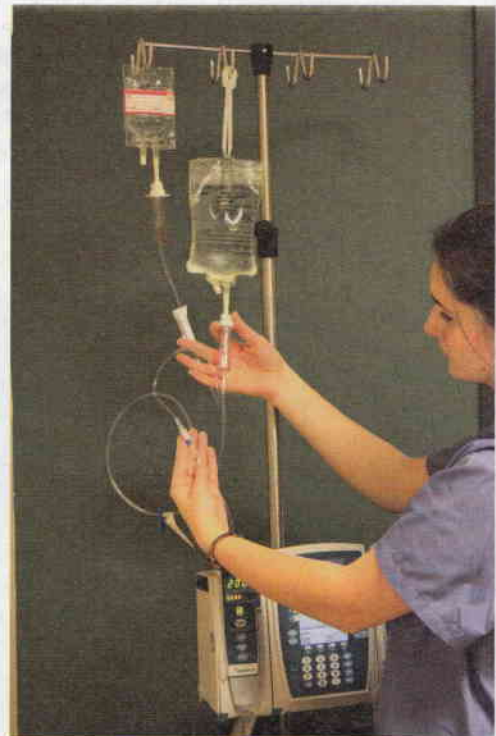


Figure 33-30 Piggyback setup. **Source:** Courtesy Sharon Kaasalainen, RN, PhD.

► SKILL 33-7 Administering Medications by Intravenous Bolus

Delegation Considerations

The administration of medications by IV bolus cannot be delegated to unregulated care providers (UCPs). Instruct UCPs to report immediately any unexpected drug reactions, discomfort at the infusion site, and changes in any required vital signs.

Equipment

- A watch with a second hand
- Medication administration record (MAR) or computer printout
- Clean gloves
- Antiseptic swab
- IV push (existing line):
 - Medication in a vial or ampule
 - Syringe for medication preparation
 - Needleless device or sterile needle (21–25 gauge)
- IV lock:
 - Syringe and needleless device (21–25 gauge) for medication preparation
 - Vial of the appropriate flush solution (saline is most common, but heparin may also be used; if heparin is used, the most common concentration is 10 to 100 units; check agency policy)

Procedure

STEPS

RATIONALE

1. Check the accuracy and completeness of each MAR or computer printout against the prescriber's original medication order. Check the patient's name and the medication name, route, dosage, and time of administration. Copy or rewrite any portion of the MAR that is difficult to read.

Critical Decision Point: Some IV medications can be pushed safely only when the patient is being continuously monitored for dysrhythmias, blood pressure changes, or other adverse effects. Therefore, some medications can be pushed only in specific areas within a health care agency. Confirm the institutional guidelines regarding requirements for special monitoring and verify that these requirements are available before giving medication.

2. Collect the information necessary to administer the medication safely, including action, purpose, side effects, normal dose, time of peak onset, the pace at which to give the medication, and nursing implications, such as the need to dilute the medication or to administer it through a filter.
3. If pushing the medication into an IV line, determine the compatibility of the medication both with the IV fluids and any additives in the IV solution.
4. Perform hand hygiene. Assess the IV or saline (heparin) lock insertion site for signs of infiltration or phlebitis (see Chapter 39).
5. Check the patient's medical history and allergies.
6. Check the date of expiration for the medication vial or ampule.
7. Assess the patient's understanding of the purpose of medication therapy.
8. Prepare the ordered medication from the vial or ampule using aseptic technique (see Skill 33-3). Check the label of the medication carefully with the MAR two times. Apply a removable label indicating the patient's name and the medication name and dosage to the removable needle cap.

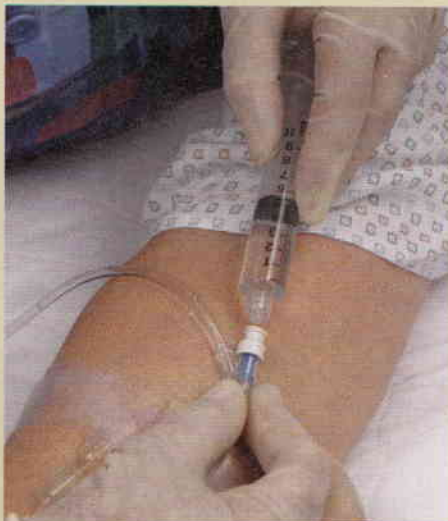
- Intravenous medications are not always compatible with IV solutions and additives.
- Confirming the placement of the IV catheter and the integrity of the surrounding tissue ensures the medication is administered safely.
- The intravenous bolus delivers medication rapidly. Allergic reactions can be fatal.
- Drug potency sometimes increases or decreases when medications are expired.

Critical Decision Point: Some IV medications require dilution before administration. Verify the dilution requirements with the agency policy. If a small amount of medication is given (e.g., less than 1 mL), dilute the medication in 5 to 10 mL of normal saline or sterile water so that the medication does not collect in the "dead spaces" (e.g., the Y-site injection port or IV cap) of the IV delivery system.

Continued

► SKILL 33-7 Administering Medications by Intravenous Bolus—cont'd

9. Take the medication to the patient at the correct time.
 10. Identify the patient using at least two patient identifiers.
Compare the patient's name and one other identifier (e.g., the hospital identification number) on the MAR, computer printout, or computer screen against information on the patient's identification bracelet. Ask the patient to state his or her name if possible, for a third identifier.
 11. Compare the label of the medication with the MAR at the patient's bedside.
 12. Explain the procedure to the patient. Encourage the patient to report symptoms of discomfort at the IV site.
 13. Perform hand hygiene. Apply gloves.
 14. Administer the medication by IV push (through the existing IV line):
 - A. Select the injection port of the IV tubing closest to patient.
Whenever possible, the injection port should accept a needleless syringe. Use the IV filter if required by a medication reference manual or agency policy.
 - B. Wipe the injection port with an antiseptic swab. Allow to dry.
 - C. Connect the syringe to the IV line. Insert the needleless tip or a small-gauge needle of a syringe containing the prepared drug through the centre of the injection port (see Step 14C illustration).
 - D. Occlude the IV line by pinching the tubing just above the injection port.
- The *third check* of the medication label against the MAR at bedside reduces medication administration errors.
 - Asking the patient to report symptoms of discomfort helps in early identification of infiltration.
 - Hand hygiene reduces the transmission of infection. During IV bolus administration, the risk of blood exposure is low. However, you may need to manipulate the IV dressing or expose the site while you complete other activities. Gloves reduce your exposure.
 - The WHO (2005), Wilburn & Eijkemans (2004), Health Canada (1999), the CCOHS (2005), and the National Institute for Occupational Safety and Health (NIOSH) (1999), which is part of the Centers for Disease Control and Prevention (CDC), strongly recommend that all IV injection sites be needleless to prevent needle-stick injuries.
 - Wiping with an antiseptic swab prevents the introduction of microorganisms during needle insertion.
 - This procedure prevents damage to the port's diaphragm and subsequent leakage.
 - This step is the *final check* that the medication is being delivered into the bloodstream.



Step 14C Connecting the syringe to the IV line with a blunt needleless cannula tip.

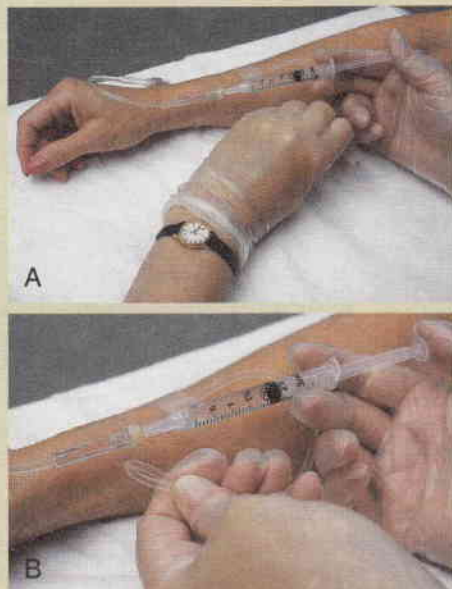


Step 14D Intravenous line pinched above the injection port for medication infusion.

Critical Decision Point: In some cases, especially with a smaller gauge IV needle or a needleless device, the blood return may not be aspirated, even if the IV is patent (open and unblocked). If the IV site does not show signs of infiltration, and the IV fluid is infusing without difficulty, proceed with the IV push.

► SKILL 33-7 Administering Medications by Intravenous Bolus—cont'd

- E. Release the tubing and inject the medication within the amount of time recommended by institutional policy, the pharmacist, or a medication reference manual. Use your watch to time the administration (see Step 14E illustration). The IV line may be pinched while pushing medication and released when not pushing medication (see Step 14E illustration). Allow the IV fluids to infuse when the medication is not being pushed.



Step 14E A, Timing the IV push medication. B, The IV line is pinched off for medication infusion (optional).

- Following the proper procedure ensures safe medication infusion. Rapid injection of IV medication can prove fatal. Allowing the IV fluids to infuse while not pushing the IV drug enables medications to be delivered to the patient at a prescribed rate.

Critical Decision Point: If the IV medication is incompatible with IV fluids, stop the IV fluids, clamp the IV line, flush with 10 mL of normal saline or sterile water, give the IV bolus over the appropriate amount of time, flush with another 10 mL of normal saline or sterile water at the same rate as the medication was administered, and then restart the IV fluids at the prescribed rate. If the IV that is currently hanging is a medication, disconnect the IV, and administer the IV push as outlined in Step 14. This step avoids giving the patient a sudden bolus of the medication in the existing IV line and avoids creating potential risks associated with IV incompatibilities. Some IV medications and fluids cannot be stopped. Verify the institutional policy regarding the temporary stopping of IV fluids or continuous IV medications. If unable to stop the IV infusion, start a new IV site and administer the medication using the IV lock method.

- F. After injecting the medication, release the tubing, withdraw the syringe, and recheck the fluid infusion rate.
15. Administer medications by IV push (IV lock or a needleless system):
- A. Prepare the flush solutions according to agency policy. Ensure that a syringe with the correct barrel width is used. Consult with agency policy regarding syringes for delivering IV bolus medications.
- (1) Saline flush method (preferred method):
- (a) Prepare two syringes with 2–3 mL of normal saline (0.9%) in a syringe.
- (2) Heparin flush method (traditional method):
- (a) Prepare one syringe with the ordered amount of heparin flush solution.
- (b) Prepare two syringes with 2–3 mL of normal saline.
- Injection of the bolus may alter the rate of fluid infusion. Rapid fluid infusion can cause circulatory overload.
 - Small syringes with narrow bores (e.g., 1 mL or 3 mL) create greater pressure per square inch (PSI) when used to inject solutions into an IV line. A high PSI can damage the lumen of certain types of in-dwelling IV catheters (central lines and peripherally inserted central catheter [PICC] lines). Ensure that you consult with agency policy to ensure safe maintenance of these lines.
 - Normal saline has been found to be effective in keeping IV locks patent and is compatible with a wide range of medications.

Continued

► SKILL 33-7 Administering Medications by Intravenous Bolus—cont'd

B. Administer medication:

- (1) Wipe the lock's injection port with an antiseptic swab.
- (2) Insert a syringe containing normal saline into the injection port of the IV lock (see Step 15B2 illustration).



Step 15B (2) Syringe inserted into the injection port.

- (3) Pull back gently on the syringe plunger and look for blood return.

- Wiping the injection port prevents introduction of microorganisms during the needle insertion.

- This step determines whether the IV needle or catheter is positioned in the vein.

Critical Decision Point: Sometimes a saline (or heparin) lock will not yield a blood return even though the lock is patent. If the IV site does not show signs of infiltration, proceed with the IV push.

- (4) Flush the IV lock with normal saline by pushing slowly on the plunger.

- Flushing the IV lock clears it of blood.

Critical Decision Point: Observe closely the area of skin above the IV catheter. As the IV lock is flushed, note any puffiness or swelling, which could indicate infiltration into the vein, and thereby require removal of the catheter.

- (5) Remove the saline-filled syringe.
- (6) Clean the lock's injection port with an antiseptic swab.
- (7) Insert the syringe containing the prepared medication into the injection port of the IV lock.
- (8) Inject the medication within the amount of time recommended by institutional policy, the pharmacist, or a medication reference manual. Use a watch to time the administration.
- (9) After administering the bolus, withdraw the syringe.
- (10) Clean the lock's injection port with an antiseptic swab.
- (11) Attach the syringe with normal saline and inject the normal saline flush at the same rate that the medication was delivered.

- Cleaning the injection port prevents transmission of infection.
- Rapid injection of the IV medication can result in death. Following the guidelines for IV push rates promotes patient safety (Karch & Karch, 2003).

- (12) *Heparin flush option:* Insert the needle of the syringe containing the heparin through the diaphragm.

- Cleaning the injection port prevents transmission of microorganisms.
- Irrigation with saline prevents occlusion of the IV access device and ensures all medication is delivered. Flushing the IV site at the same rate as the medication ensures that any medication remaining within the IV needle is delivered at the correct rate.
- Inserting the needle through the diaphragm maintains the patency of the IV catheter and tubing by inhibiting clot formation. Use the SASH method: **S**aline, **A**dministration of medication, **S**aline, **H**eparin.
- Proper disposal reduces the risk of accidental needle sticks.
- Proper hygiene reduces the transmission of microorganisms.
- IV medications act rapidly.
- Swelling indicates infiltration into tissues surrounding the vein.
- IV bolus medications often cause rapid changes in the patient's physiological status. Some medications require careful monitoring and assessment and possible laboratory testing (e.g., vasopressors require the monitoring of blood pressure and heart rate; dilantin requires laboratory studies to determine whether it is at a therapeutic level).

16. Dispose of uncapped needles and syringes in puncture-proof and leak-proof container.
17. Remove and dispose of gloves. Perform hand hygiene.
18. Observe the patient closely for adverse reactions while the medication is administered and for several minutes thereafter.
19. Observe the IV site during injection for sudden swelling.
20. Observe the patient's status after administering the medication to evaluate the effectiveness of medication.

► SKILL 33-7 Administering Medications by Intravenous Bolus—cont'd

21. Consult with agency policy with regard to the frequency of saline flushes.
22. Ask the patient to explain the medication's purposes and side effects.

Unexpected Outcomes

Adverse reaction to medication

Symptoms of infiltration or phlebitis at intravenous site

Recording and Reporting

- Record the medication, dose, time, and route on the appropriate form (MAR) or in computer record.
- Report any adverse reactions immediately to the health care provider because the reactions could be life-threatening. The patient's response may indicate the need for additional medical therapy.
- Record the patient's response to medication in the nurses' notes.

- To maintain patency of intravenous catheters (peripheral or central), IV devices require routine flushing. Short-term peripheral angiocatheters are flushed every 12 hours with a normal saline solution. Consult with agency policy with regard to protocols for flushing central lines.

Related Interventions

- Stop delivering medication immediately and follow institutional policy or guidelines for the appropriate response and reporting of adverse drug reactions.
- Notify the patient's health care provider of adverse effects immediately.
- Add allergy information to the patient's medical record.
- Immediately discontinue administration of the injection and discontinue use of the site.
- Follow institutional guidelines on appropriate extravasation care.

setup, the main line does not infuse when the piggybacked medication is infusing. The port of the primary IV line contains a back-check valve that automatically stops flow of the primary infusion when the piggyback infusion flows. After the piggyback solution infuses and the solution within the tubing falls below the level of the primary infusion drip chamber, the back-check valve opens and the primary infusion again flows.

Tandem. A tandem setup is a small (25 to 100 mL) IV bag or bottle connected to a short tubing line that connects to the lower Y-port of a primary infusion line or to an intermittent venous access. The tandem set is placed at the same height as the primary infusion bag or bottle. In the tandem setup, the tandem and the main line infuse simultaneously. Monitor the tandem setup closely. If it is not immediately clamped when the medication is infused, the IV solution from the primary line will back up into the tandem line.

Mini-Infusion Pump. The mini-infusion pump is battery operated and allows medications to be given in very small amounts (5 to 60 mL) within controlled infusion times using standard syringes (Skill 33-8).

Intermittent Venous Access. An intermittent venous access (commonly called a heparin lock or saline lock) is an IV catheter with a small chamber covered by a rubber diaphragm or a specially designed cap (Figure 33-31). Special rubber-seal injection caps accept the needle safety devices and can be inserted into most IV catheters (see Chapter 39). Advantages to intermittent venous access include the following:

- Reduced risk of the patient developing fluid volume excess
 - Increased mobility, safety, and comfort for the patient
- Before administering an IV bolus or piggyback medication, assess the patency and placement of the IV site. After the medication has been administered through an intermittent venous access, the access must be flushed with a solution to keep it patent. In general, normal saline is an effective flush



Figure 33-31 Intermittent lock covered with a rubber diaphragm.

solution for peripheral catheters. Some institutions require the use of heparin. Verify and follow the institution's policies regarding the care and maintenance of the IV site.

Administration of IV Therapy in the Home. Sometimes patients may be discharged from an acute care setting and continue to receive IV therapy in the home setting. Medications such as antibiotics, chemotherapy, total parenteral nutrition, pain medications, and blood transfusions may be given in the home. Most patients who have home IV therapy will have a central venous catheter inserted before their discharge (see Chapter 39). In addition, patients who need to receive IV therapy in the home have home care nurses who assist in the management of the IV therapy.

However, patients and their families need to be carefully assessed for their ability to manage this therapy at home. Instruction on IV care management must be provided while the patient is still in the hospital. Patients and their families need to be taught how to recognize problems and what to do when these problems occur. It is important for the

Text continued on p. 747

► SKILL 33-8

Administering Intravenous Medications by Piggyback, Intermittent Intravenous Infusion Sets, and Mini-Infusion Pumps**Delegation Considerations**

The administration of medications by IV fluid by piggyback, intermittent IV infusion sets, and mini-infusion pumps cannot be delegated to unregulated care providers (UCPs). Instruct UCPs to report any unexpected drug reactions or discomfort at the infusion site as soon as possible.

Equipment

- Antiseptic swab
- IV pole
- Medication administration record (MAR) or computer printout
- Medication labels
- Piggyback, tandem, or mini-infusion pump:
- Medication prepared in 5- to 150-mL labelled infusion bag or syringe
- Short microdrip or macrodrip tubing set for piggyback (may have needleless system attachment)
- Needleless device or stopcocks if available
- Needles (21 or 23 gauge, only if stopcocks or other needleless methods are not available)
- Mini-infusion pump
- Adhesive tape (optional)
- Volume-control administration set
- Volutrol, Buretrol, or Pediatrol
- Infusion tubing (may have needleless system attachment)
- Syringe (1-20 mL)
- Vial or ampule of ordered medication

Procedure**STEPS**

1. Check the accuracy and completeness of each MAR or computer printout against the prescriber's original medication order. Check the patient's name and the medication name, route, dosage, and time of administration. Copy or rewrite any portion of the MAR that is difficult to read.
2. Determine the patient's medical history.
3. Collect the information necessary to administer the medication safely, including the action, purpose, side effects, normal dose, time of peak onset, and nursing implications.
4. Assess the compatibility of the drug with the existing IV solution.

RATIONALE

- The order sheet is the most reliable source and only legal record of medications patients are to receive. Checking the accuracy of the medication order ensures that the patient receives the correct medications. Illegible MARs are a source of medication errors.
- Information about the medication indicates the type of appropriate IV solution to use and helps to ensure safe and accurate medication administration.
- Drugs that are incompatible with IV solutions may result in clouding or crystallization of the solution in IV tubing, which may harm the patient.

Critical Decision Point: Never administer IV medications through tubing that is infusing blood, blood products, or parenteral nutrition solutions.

5. Assess the patency of the patient's existing IV infusion line by noting the infusion rate of the main IV line.

- The IV line must be patent and fluids must infuse easily for medication to reach the venous circulation effectively.

Critical Decision Point: If the patient's IV site is saline locked, clean the port with alcohol and assess the patency of the IV line by flushing it with 2–3 mL of sterile normal saline. Attach the appropriate IV tubing to the saline lock and administer the medication via piggyback, tandem, mini-infusion, or volume-control administration set. When the infusion is completed, disconnect the tubing, clean the port with alcohol, and flush the IV line with 2–3 mL sterile normal saline. Maintain sterility of the IV tubing between intermittent infusions.

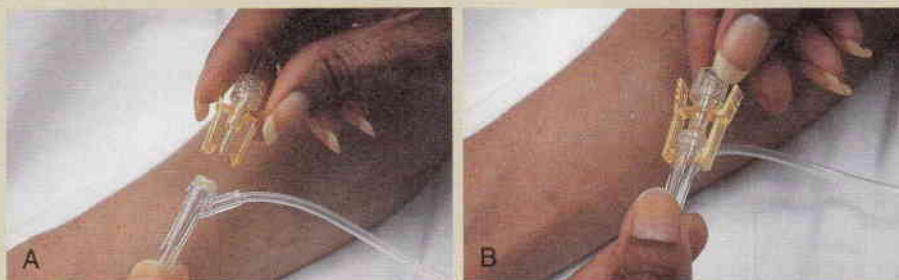
6. Perform hand hygiene. Assess the IV insertion site for signs of infiltration or phlebitis: redness, pallor, swelling, tenderness on palpation.
7. Assess the patient's history of medication allergies.
8. Assess the patient's understanding of purpose of medication therapy.
9. Prepare the medication. Ensure that you compare the label of the medication with the MAR two times while preparing the medication.
10. Assemble the supplies at the bedside. Prepare the patient by explaining that the medication will be given through the IV equipment.

- Confirmation of placement of IV needle or catheter and integrity of surrounding tissues ensures medication is administered safely.
- The effects of medications can develop rapidly after IV infusion. You should be aware of patients who are at risk for an allergic reaction.
- Ensure that correct medication is given to patient. *First and second checks for accuracy ensure that the correct medication is administered.*

► SKILL 33-8

Administering Intravenous Medications by Piggyback, Intermittent Intravenous Infusion Sets, and Mini-Infusion Pumps—cont'd

11. Perform hand hygiene.
 12. Identify the patient using at least two patient identifiers. Compare the patient's name and one other identifier (e.g., the hospital identification number) on the MAR, computer printout, or computer screen against information on the patient's identification bracelet. Ask the patient to state his or her name, if possible, for a third identifier.
 13. Compare medication label with MAR at patient's bedside.
 14. Explain to the patient the purpose of the medication and its side effects. Encourage the patient to report symptoms of discomfort at the injection site.
 15. Administer the infusion:
 - A. Piggyback or tandem infusion
 - (1) Connect the infusion tubing to the medication bag (see Chapter 39). Allow the solution to fill the tubing by opening the regulator flow clamp. Once the tubing is full, close the clamp and cap the end of the tubing.
 - (2) Hang the piggyback medication bag above the level of the primary fluid bag. (A hook may be used to lower the main bag.) Hang the tandem infusion at same level as the primary fluid bag.
 - (3) Connect the tubing of the piggyback or tandem infusion to the appropriate connector on the primary infusion line:
 - (a) *Stopcock*: Wipe the stopcock port with an alcohol swab and connect the tubing. Turn the stopcock to the open position.
 - (b) *Needleless system*: Wipe the needleless port, and insert the tip of the piggyback or tandem infusion tubing (see Step 15A[3][b] illustrations).
- This process complies with the Joint Commission's (2007) requirements and improves medication safety. In acute care settings, the patient's name and identification number on an armband and the MAR are usually used to identify patients. Identification bracelets are made at the time of the patient's admission and are the most reliable source of information. The patient's room number is *not* an acceptable identifier.
 - *This is the third accuracy check.*
 - Communication with the patient keeps the patient informed of planned therapies. Patients who can verbalize pain at the IV site can help detect IV infiltrations early, reducing the possibility of damage to the surrounding tissues.
 - The infusion tubing should be filled with solution and free of air bubbles to prevent an air embolus.
 - The height of the fluid bag affects the rate of medication flow to the patient.
 - The WHO (2005), Wilburn & Eijkemans (2004), Health Canada (1999), the CCOHS (2005), and the CDC (NIOSH, 1999) strongly recommend that all IV injection sites be needleless to prevent needlestick injuries. The needleless system establishes the route for IV medication to enter the main IV line.



Step 15A(3)(b) A, Needleless lever lock cannula system. B, The blunt-ended cannula inserts into the port and locks.

- (c) *Tubing port*: Connect the sterile needle to the end of the piggyback or tandem infusion tubing, remove the cap, clean the injection port on the main IV line, and insert the needle or needleless access device through the centre of the port. Secure by taping the connection.
 - (4) Regulate the flow rate of the medication solution by adjusting the regulator clamp. (Infusion times vary. Refer to a medication reference manual or institutional policy for the safe flow rate.)
- Use this step *only* if the needleless system is not available. The tubing port prevents the introduction of microorganisms during needle insertion.
 - The proper flow rate provides a slow, intermittent infusion of medication and maintains therapeutic blood levels.

Continued

► SKILL 33-8

Administering Intravenous Medications by Piggyback, Intermittent Intravenous Infusion Sets, and Mini-Infusion Pumps—cont'd

(5) After medication has infused, check the flow regulator on the primary infusion. The primary infusion should automatically begin to flow after the piggyback or tandem solution is empty.

(6) Regulate the main infusion line to the desired rate, if necessary.

(7) Leave the IV piggyback bag and tubing in place for future medication administration or discard in appropriate containers.

B. Volume-control administration set (e.g., Volutrol)

(1) Assemble the supplies in the medication room.

(2) Prepare medication from a vial or ampule (see Skill 33-3).

(3) Fill the Volutrol with the desired amount of fluid (50–100 mL) by opening the clamp between the Volutrol and the main IV bag (see Step 15B[3] illustration).

- The back-check valve on the piggyback stops the flow of the primary infusion until the second medication infuses. The tandem and primary infusions flow together until the tandem set empties. Monitoring the flow rate ensures the proper administration of IV fluids.
- The infusion of the piggyback may interfere with the main line infusion rate.
- The establishment of a secondary line produces a route for microorganisms to enter the main line. Repeated changes in the tubing increase the risk of infection transmission (check agency policy).
- Use of the medication room controls the risk of contaminating the IV solution.
- Following proper procedure ensures the medication is sterile.
- Use of a small volume of fluid dilutes the IV medication and reduces the risk of too-rapid infusion.



Step 15B(3) Filling the volume control administration device.

(4) Close the clamp and ensure the clamp on the air vent of the Volutrol chamber is open.

(5) Clean the injection port on the top of the Volutrol with an antiseptic swab.

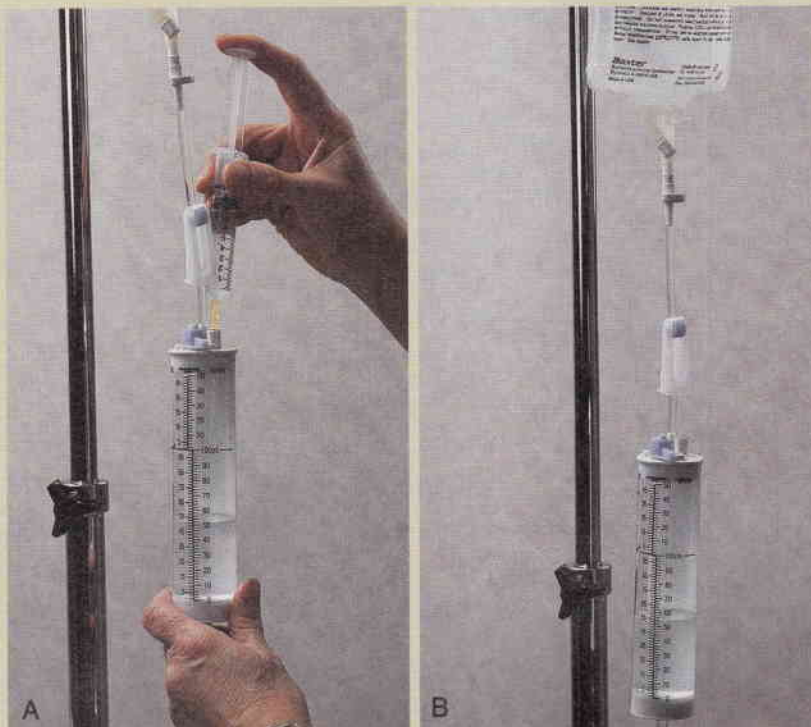
- Prevents additional leakage of fluid into the Volutrol. The air vent allows fluid in the Volutrol to exit at regulated rate.
- Cleaning the injection port prevents the introduction of microorganisms during needle insertion.

► SKILL 33-8

Administering Intravenous Medications by Piggyback, Intermittent Intravenous Infusion Sets, and Mini-Infusion Pumps—cont'd

- (6) Remove the needle cap or sheath and insert the syringe needle through the port, then inject the medication (see Step 15B[6] illustrations). Gently rotate the Volutrol between your hands.

- Rotating mixes the medication with the solution in the Volutrol to ensure equal distribution.



Step 15B(6) A, Medication injected into the device. B, The prepared device.

- (7) Regulate the IV infusion rate to allow the medication to infuse in the time recommended by institutional policy, a pharmacist, or a medication reference manual.
- (8) Label the Volutrol with the name of the medication, the dosage, the total volume (including the diluent), and the time of administration.
- (9) Dispose of the uncapped needle or the needle enclosed in safety shield and syringe in a proper container. Perform hand hygiene.

C. Mini-infusion administration

- (1) Connect the prefilled syringe to the mini-infusion tubing.
- (2) Carefully apply pressure to the syringe plunger, allowing the tubing to fill with medication.

- For optimal therapeutic effect, the medication should infuse in prescribed time interval.
- Proper labelling alerts nurses to medication being infused and prevents other medications from being added to the Volutrol.
- Proper disposal prevents accidental needle-stick injuries. Hand hygiene reduces the transmission of microorganisms.
- The special tubing is designed to fit the syringe to deliver the medication to the main IV line.
- Applying pressure ensures the tubing is free of air bubbles to prevent an air embolus.

Continued

► SKILL 33-8

Administering Intravenous Medications by Piggyback, Intermittent Intravenous Infusion Sets, and Mini-Infusion Pumps—cont'd

- (3) Place the syringe into a mini-infusor pump (follow product directions). Ensure the syringe is secure (see Step 15C[3] illustration).



Step 15C(3) Securing the syringe into a mini-infusor.

- (4) Connect the mini-infusion tubing to the main IV line.
- Stopcock:* Wipe the stopcock port with an alcohol swab and connect the tubing. Turn the stopcock to the open position.
 - Needleless system:* Wipe the needleless port and insert the tip of the mini-infusor tubing.
 - Tubing port:* Connect the sterile needle to the mini-infusion tubing, remove the cap, clean the injection port on the main IV line, and insert the needle through the centre of the port. Consider placing tape where the IV tubing enters the port to secure the connection.
- (5) Explain the purpose of the medication and the side effects to the patient and explain that the medication is to be given through the existing IV line. Ask the patient to report any symptoms of discomfort at the injection site.
- (6) Hang the infusion pump with the syringe on the IV pole alongside the main IV bag. Set the pump to deliver medication within the time recommended by institutional policy, the pharmacist, or a medication reference manual. Press the button on the pump to begin infusion. Optional: Set the alarm.
- (7) After medication has infused, check the flow regulator on the primary infusion. The infusion should automatically begin to flow once the pump stops. Regulate the main infusion line to the desired rate as needed. (Note: If the stopcock is used, turn off the mini-infusion line.)
- Observe the patient for signs of adverse reactions.
 - During infusion, periodically check the infusion rate and the condition of the IV site.
 - Ask the patient to explain the purpose and side effects of the medication.
- Use of the stopcock reduces the risk of needle-stick injuries.
 - Cleaning reduces the transmission of microorganisms.
 - Proper communication informs the patient of planned therapies.
 - The pump automatically delivers medication at a safe, constant rate, on the basis of the volume in the syringe. (An alarm is used if the medication is delivered into a heparin or saline lock.)
 - Proper flow maintains the patency of primary IV line.
 - IV medications act rapidly.
 - The IV must remain patent for proper medication administration. If infiltration develops, discontinue the infusion.
 - Asking the patient about the medication evaluates the patient's understanding of the instructions.

► SKILL 33-8

Administering Intravenous Medications by Piggyback, Intermittent Intravenous Infusion Sets, and Mini-Infusion Pumps—cont'd**Unexpected Outcomes***Adverse drug reaction**Medication does not infuse over desired period**Swelling, warmth, reddening, and tenderness at intravenous site, indicating phlebitis (see Chapter 39)**Coolness, pallor, and swelling at intravenous site (see Chapter 39)***Related Interventions**

- Stop medication infusion immediately.
- Follow institutional policy or guidelines for the appropriate response, assessments, and reporting of adverse drug reactions.
- Notify the patient's health care provider of adverse effects immediately.
- Document the allergy in the patient's medical record.
- Determine the reason for the lack of infusion (e.g., improper calculation of flow rate, wrong positioning of the IV needle at the insertion site, or infiltration).
- Take corrective action as indicated.
- Stop IV infusion.
- Discontinue IV.
- Treat the IV site as indicated by the institutional policy.
- Insert a new IV site if continuation of therapy is indicated.
- Signs of infiltration are indicated.
- Some IV medications are extremely harmful to subcutaneous tissue.
- Provide IV extravasation care as indicated by institutional policy; or use a medication reference manual or consult a pharmacist to determine the appropriate follow-up care.

Recording and Reporting

- Record the medication, dose, route, and time administered on the MAR or computer printout.
- Record on the intake and output from the volume of fluid in the medication bag or Volutrol.
- Report any adverse reactions to the nurse in charge or the physician.

Home Care Considerations

- Teach the patient and caregiver to dispose of needles and contaminated equipment in puncture-proof containers (e.g., a coffee can).
- Instruct the patient's family about community resources for obtaining supplies.
- Collaborate with the interdisciplinary team to facilitate access to supplies for patients who have both physical and geographical barriers.

patient's family to recognize signs of infection and complications and to know that when these signs occur, the home care nurse or physician must be notified. In addition, patients and their families need information regarding the maintenance of IV administration equipment, including the infusion pump.

Subcutaneous Butterfly Catheters. Subcutaneous butterfly catheters provide a route for both subcutaneous medication administration and hypodermoclysis (Box 33-26). As a route for medication administration, subcutaneous butterfly catheters reduce the frequency of breaking the skin barrier to inject a medication. This route is used for patients requiring longer-term therapy with medication that is administered via subcutaneous injection. **Hypodermoclysis** is the administration of fluids through a butterfly catheter and is commonly used for patients with limited intravenous access, palliative care patients, and patients at risk for or with mild dehydration.

A fine-gauge needle (e.g., 24-gauge) is inserted into the patient's subcutaneous tissue. The preferred site for subcutaneous butterfly catheters is the subcutaneous tissue of the abdomen. Other appropriate sites include the subcutaneous tissue of the upper arms, upper back (scapular area), anterior thighs, and the anterior upper chest (avoiding the breast and axilla). Do not insert a subcutaneous butterfly catheter into

tissues that have recently been irradiated or where a rash, bruising, or scar tissue is present. After inserting a subcutaneous butterfly catheter, only one type of medication can be injected (e.g., morphine).

Contraindications to using the hypodermoclysis route for IV fluid administration include cardiac failure, prerenal or renal failure, low platelet or coagulation disorders, and existing fluid overload or marked edema (see Chapter 39). If a patient is severely dehydrated, the intravenous route is preferred for fluid administration.

❖ KEY CONCEPTS

- Learning the medication classifications improves your understanding of nursing implications for administering medications with similar characteristics.
- Federal medication legislation regulates the production, distribution, prescription, and administration of medications.
- All controlled substances are handled according to strict procedures that account for each medication.
- Apply your understanding of the physiology of medication action when physically assessing a patient before medication, timing the administration, selecting routes, initiating actions to promote medication efficacy, and observing responses to medications.

► BOX 33-26 Procedural Guideline

Subcutaneous Butterfly Catheters and Hypodermoclysis

Delegation Considerations:

The insertion of subcutaneous butterfly catheters cannot be delegated. Instruct unregulated care providers to report the occurrence of side effects of medications immediately.

Equipment:

- Butterfly catheter with 24-gauge, 19-mm needle (the smallest and shortest gauge should be used)
- Interline injection site
- Antiseptic swab
- Occlusive dressing (Tegaderm or Opsite)
- Tape
- Clean gloves

Subcutaneous Medication Administration

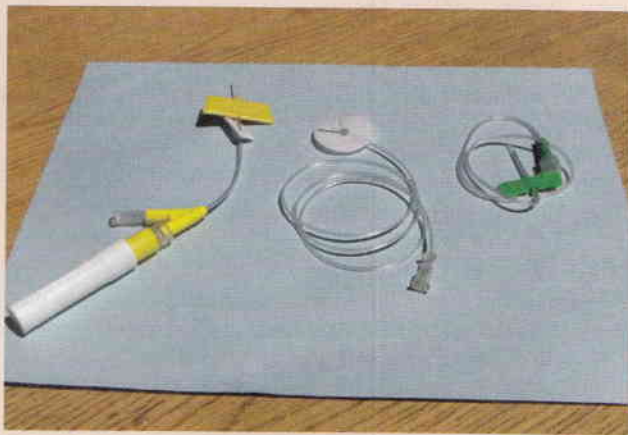
- Ordered medication
- Syringe and needleless access device

Hypodermoclysis

- Ordered IV fluid
- IV administration set

Procedure:

1. Check the accuracy and completeness of each medication administration record (MAR) or computer printout against the prescriber's original medication order. Check the patient's name and the medication name, route, dosage, and time of administration. Copy or rewrite any portion of the MAR that is difficult to read.
2. Assess the patient's medical history, medication history, and history of allergies; know the substances the patient is allergic to and the allergic reaction.
3. Check the date of expiration for the medication.
4. Assess the adequacy of adipose tissue and any contraindications, such as rash, bruising, or scar tissue.
5. Remove the butterfly catheter from the package (see Step 5 illustration). Replace the existing cap with an interlink injection site.



Step 5 Subcutaneous butterfly catheters. **Source:** Courtesy Lynne Thibeault, Confederation College, Thunder Bay, ON.

6. *Subcutaneous medication administration:* Aseptically prepare the correct medication dose from an ampule or vial (see Skill 33-3). Ensure all air is expelled. Check the label of the medication with the MAR two times while preparing the medication. Replace the needle with a needleless injection device, clean the interlink injection port with an aseptic swab, and prime the subcutaneous catheter tubing. *Hypodermoclysis:* Attach the IV line to the interlink injection site on the subcutaneous butterfly catheter device and prime the unit.
7. Take the medication to the patient at the right time and perform hand hygiene.
8. Close the room curtain or door to provide privacy.
9. Identify the patient using at least two identifiers. Compare the patient's name and one other identifier (e.g., the hospital identification number) on the MAR, computer printout, or computer screen against information on the patient's identification bracelet. Ask the patient to state his or her name, if possible, as a third identifier.
10. Compare the label of the medication with the MAR one more time at the patient's bedside.
11. Explain to the patient the steps of the procedure and the sensations to expect, including a slight burning or stinging when the catheter is inserted. Inform the patient that the catheter will remain and will be used for medication administration of a particular medication.
12. Keep a sheet or gown draped over the body parts not requiring exposure.
13. Apply clean gloves.
14. Select an appropriate injection site. Inspect the skin surface over the sites for bruises, inflammation, or edema.
15. Palpate the sites for masses or tenderness. Avoid these areas.
16. Assist the patient into a comfortable position; have the patient relax the abdomen, thigh, or upper arm, depending on selected site.
17. Locate the site using appropriate anatomical landmarks.
18. Clean the site with an antiseptic swab. Apply the swab at the centre of the site and rotate outward in a circular direction for about 5 cm.
19. Remove the sheath from the catheter needle by pulling it straight off.
20. Hold the subcutaneous butterfly wings between the thumb and forefinger of your dominant hand with the palm down.
21. Ensure the bevel of the needle is pointed upward.
22. Using the thumb and index finger of your nondominant hand, gently pinch the patient's skin around the selected injection site to create a roll of skin 1.25 to 2.5 cm in diameter.
23. Insert the full length of the needle through the skin at a 30-degree angle.
24. Assess for blood return into the catheter tubing. If blood return occurs, withdraw the needle and repeat the procedure at a new site.
25. Release the catheter wings and stabilize them on the skin surface with your thumb and index finger.
26. Apply an occlusive dressing (e.g., Tegaderm, Opsite) over the insertion site and some of the tubing. Reinforce the dressing with tape.

► BOX 33-26 Procedural Guideline—cont'd

27. Apply a label to the occlusive dressing that shows the date and time of administration and your initials.
28. *Subcutaneous medication administration:* Wipe the interlink injection port with an antiseptic swab and administer the medication. *Hypodermoclysis:* Adjust the flow rate of IV fluids according to the physician's order.

29. Dispose of the syringe with the needleless injection device into a sharps container.
30. Remove gloves and discard. Perform hand hygiene.
31. Document the procedure, including the site, type, and gauge of subcutaneous butterfly catheter; the date and time of insertion; the patient's response to the insertion; and your initials.

- The older adult's body undergoes structural and functional changes that alter medication actions and influence the way in which medication therapy is provided.
- Children's medication doses are computed on the basis of body surface area and weight.
- Medications given parenterally are absorbed more quickly than medications administered by other routes.
- Each medication order should include the patient's name; the order date; the medication name, dosage, route, time of administration, and indication; and the prescriber's signature.
- A medication history reveals allergies, medications that the patient is taking, and the patient's compliance with therapy.
- The nursing process should be used when administering medication.
- The 10 rights of medication administration ensure accurate preparation and administration of medication doses.
- The 10 rights of medication administration are the right medication, right dose, right patient, right route, right time and frequency, right documentation, and right reason, right evaluation (or assessment), right patient education, and right to refuse.
- Administer only the medications that you prepare; never leave prepared medications unattended.
- Avoid distractions and follow the same routines when preparing medications to reduce the chance of medication errors.
- Never recap needles.
- To prevent medication errors, document immediately all medications you administer.
- Use your clinical judgement to determine the best time to administer "prn" (when needed) medications.
- Report medication errors immediately.
- When preparing medications, check the medication container label against the medication administration record three times.
- The Z-track method for intramuscular injections protects the subcutaneous tissues from irritating parenteral fluids.
- Failure to select injection sites by anatomical landmarks may lead to tissue, bone, or nerve damage.

✦ CRITICAL THINKING EXERCISES

1. Mrs. Nguyen, a 69-year-old woman, has recently experienced a stroke and has right-sided weakness. The neurological clinical nurse specialist wrote orders to start oral medications today. What steps do you take to ensure that this patient can safely receive her oral medications? What do you do if the patient is unable to swallow?
2. Marissa is a 25-year-old woman who recently delivered a healthy infant. She is to receive RhoGAM 300 mcg IM today. What size needle and which injection site and technique do you use to administer this medication?
3. Jack, a 70-year-old retired farmer, has been experiencing new respiratory difficulties. His physician has ordered him to start

using an albuterol inhaler with a spacer. What steps do you take to ensure that he can self-administer his metered-dose inhaler?

4. You receive an order to give furosemide (Lasix) 40 mg IV push. You have never given this medication on this unit. What steps do you take before administering the Lasix?

✦ REVIEW QUESTIONS

1. Which of the following rights has been added to the ten rights of medication administration?
 1. Right to refuse
 2. Right route
 3. Right medication
 4. Right patient
2. You are having difficulty reading a physician's order for a medication. You know the physician is very busy and does not like to be called. What do you do?
 1. Call a pharmacist to interpret the order.
 2. Call the physician to have the order clarified.
 3. Consult the unit manager to help interpret the order.
 4. Ask the unit secretary to interpret the physician's handwriting.
3. A patient has a gastrointestinal alteration. Which method of medication administration should *not* be used?
 1. Oral
 2. Topical
 3. Inhalation
 4. Injection
4. Most medication errors occur when the nurse
 1. Fails to follow routine procedures
 2. Is responsible for administering numerous medications
 3. Is caring for too many patients
 4. Is administering unfamiliar medications
5. A patient is to receive cephalexin (Keflex) 500 mg PO. The pharmacy has sent 250 mg tablets. How many tablets should you give?
 1. 0.5 tablet
 2. 1 tablet
 3. 1.5 tablets
 4. 2 tablets
6. A medication injection into the loose connective tissue under the dermis is known as what kind of injection?
 1. An intramuscular injection
 2. An intravenous injection
 3. A subcutaneous injection
 4. An intradermal injection

7. You are responsible for following legal provisions when administering controlled substances or narcotics. What may be the result of your failure to comply?
 1. Fines, imprisonment, and loss of nurse licensure
 2. Loss of employment
 3. Medication errors
 4. Poor health outcomes resulting from narcotic use
8. Pharmacokinetics is the study of how medications
 1. Are derived from plants
 2. Enter the body, reach their site of action, are metabolized, and exit the body
 3. Are used for certain disease processes
 4. Are manufactured and distributed to pharmaceutical companies
9. Which of the following is an official publication that sets standards for medication strength, quality, purity, packaging, safety, labelling, and dose form?
 1. *Physicians Reference Guide*
 2. *Nurse's Drug Guide*
 3. *Narcotic Control Act*
 4. *The Canadian Formulary (CF)*
10. Who is responsible for the administration of the *Food and Drugs Act* and the *Controlled Drugs and Substances Act*?
 1. Health Protection Branch (HPB)
 2. Nurse or physician dispensing and prescribing medications
 3. *Canadian Formulary*
 4. Health care institutions

✚ RECOMMENDED WEB SITES

Canadian Pharmacists Association: <http://www.pharmacists.ca>
The Canadian Pharmacists Association (CPhA) is a national organization of pharmacists. CPhA's Web site provides links to drug information, patient information, and resources.

Health Canada: Drug Products: <http://www.hc-sc.gc.ca/dhp-mpps/prodpharma/databasdon/index-eng.php/>

This Web site provides access to government reports, resources, and programs about the safety and effectiveness of pharmaceutical drugs and other therapeutic products.

Health Canada Therapeutic Products Directorate: <http://www.hc-sc.gc.ca/ahc-asc/branch-dirgen/hpfb-dgpsa/tpd-dpt/index-eng.php>

Health Canada's Therapeutic Products Directorate is the Canadian federal authority that regulates pharmaceutical drugs and medical devices for human use. This Web site provides access to information on reporting adverse reaction information.

Saskatchewan Drug Information Service: <http://druginfo.usask.ca/>

The Saskatchewan Drug Information Service (SDIS), operating from the University of Saskatchewan, aims to give health care providers and laypersons access to objective and concise information on drugs and drug therapy.

Review Question Answers

1. 1; 2. 2; 3. 1; 4. 1; 5. 4; 6. 3; 7. 1; 8. 2; 9. 4; 10. 1

Rationales for the Review Questions appear at the end of the book.

Complementary and Alternative Therapies

Written by Jean McClennon-Leong, RN, MN, FNP-BC, APNP

objectives

Mastery of content in this chapter will enable you to:

- Define the key terms listed.
- Differentiate between complementary and alternative therapies.
- Discuss the relaxation response and its effect on somatic ailments.
- Identify the principles and effectiveness of imagery, meditation, and breathwork.
- Describe the purpose and principles of biofeedback.
- Describe the methods of and psychophysiological responses to therapeutic touch.
- Explain the scope of chiropractic therapy.
- Discuss the principles and applications of acupuncture.
- Describe the effect of nutrition on disease prevention and health promotion.
- Describe safe and unsafe herbal therapies.

key terms

- | | |
|--|--------------------------------------|
| Acupoints, p. 762 | Integrative medical programs, p. 752 |
| Acupuncture, p. 762 | Integrative medicine, p. 752 |
| Allopathic medicine, p. 751 | Meditation, p. 759 |
| Alternative therapies, p. 752 | Meridians, p. 762 |
| Biofeedback, p. 760 | Natural health products, p. 763 |
| Chiropractic therapy, p. 761 | Nutrition, p. 763 |
| Complementary and alternative medicine, p. 752 | Passive relaxation, p. 757 |
| Complementary therapies, p. 752 | Progressive relaxation, p. 757 |
| Creative visualization, p. 760 | Qi, p. 762 |
| Energy flow, p. 761 | Relaxation, p. 757 |
| Herbal therapy, p. 763 | Stress response, p. 757 |
| Holistic health, p. 751 | Therapeutic touch, p. 761 |
| Imagery, p. 759 | Traditional Chinese medicine, p. 762 |
| | Yin and yang, p. 762 |

media resources

evolve WEBSITE

<http://evolve.elsevier.com/Canada/Potter/fundamentals/>

- Audio Chapter Summaries
- Examination Review Questions
- Glossary
- Student Learning Activities
- Weblinks

The philosophy of **holistic health** is not new. Holistic health takes into account and sees as a whole, all aspects of people's needs, psychological, physical and social. Aristotle first proposed that the body and mind could not be separated and that a healer must observe and reflect upon the total person. Ancient civilizations dating from 5000 B.C., including the Egyptians and Chinese, were employing and recording the effects of various herbal and energy therapies on the body. Despite the Dark Ages (1493–1541), a period in human history characterized by a loss of interest in science and an increase in magic to explain the world environment, interest in the human condition continued to grow. The roots of twentieth-century conventional medicine (**allopathic medicine**) can be traced to René Descartes (1595–1650), a deeply religious mathematician and philosopher who believed that the mind and body must be separated to protect the "spirit" from scientific inquiry. Consequently,

the development of medicine focused exclusively on physical function and reduction of the larger whole into examination of the smaller parts (Rakel & Weil, 2007). This is still evident as seen by the various fields of specialization that occur within modern medical practices. Florence Nightingale (1820–1910), the founder of modern nursing, practised a holistic approach to health. She incorporated various healing modalities along with cleanliness, sanitation, and psychological support to soldiers during the Crimean War.

At the middle of the twentieth century, cultural shifts and paradigm changes occurred. Social activism was growing, and the birth of feminism, ecology, and the consumer and civil rights movements were altering market forces and attitudes toward traditional health care delivery systems. These social movements coincided with demographic changes, increased cultural diversity, and global mobility. Ultimately, this led consumer interest toward a person-centred, empowered approach to health. People desired a different kind of health care: one that embraced healing, acknowledgement of the spiritual dimensions of health and illness, and openness toward alternative medical systems. Today, the public has enormous access to information about personal health through the Internet and organizations such as the Canadian Holistic Nurses Association.

Complementary and Alternative Medicine Therapies in Health Care

Complementary and alternative medicine (CAM) therapies are not considered a part of conventional medicine. The terms are often used interchangeably but have different meanings. **Complementary therapies** are used together with conventional medical treatments, while **alternative therapies** are used instead of conventional therapy. As its name implies, complementary therapies complement, or contribute to and enhance, conventional health care treatment. Many complementary therapies, such as acupuncture, require diagnostic and therapeutic methods specific to their field, whereas other complementary therapies, such as imagery and breathwork, are, in general, easily learned and applied. Other complementary therapies are relaxation, massage (Figure 34-1), reflexology, prayer, biofeedback, and creative therapies such as art, music,

and dance (Figure 34-2) (Fontaine, 2005). You need to become knowledgeable about the safety and efficacy of these various therapies in order to advise patients effectively and wisely.

Alternative therapies are those modalities and treatments used instead of allopathic medical care and have often been negatively viewed as interfering with compliance in the use of conventional therapies. It is often difficult to clearly define what CAM is, as it varies between cultures, availability of services, and institutions. However, recent trends suggest that developing a healthy lifestyle by promoting wellness and preventing illness and disease may be achieved by a variety of means, including the use of CAM (Rakel & Weil, 2007). CAM therapies have become a growing consumer movement, and the preferred term when describing this phenomenon is **integrative medicine**. Integrative medicine focuses on evidence-informed research to integrate CAM into current health care models so that health and healing can be facilitated with safety and effectiveness (Koopsen & Young, 2009). One major premise of this concept includes the belief that all health care providers provide the best treatment for their patients, while respecting their health care choices. In this way, integrative medicine focuses on healing, rather than disease, and allows for multiple disciplines in providing care.

Complementary and alternative therapies are often organized into five categories that researchers find useful (Box 34-1). Some types of complementary and alternative therapies are presented in Table 34-1. This list is not exhaustive and does not address issues of safety and efficacy.

Public Interest in Complementary and Alternative Medicine Therapies

Increasingly, the boundaries between CAM and allopathic medicine are being eroded. The interest in CAM is evident in the increased number of articles about it in respected medical journals and the development of several journals specific to CAM. Some universities are adding courses about CAM therapies to their medical and nursing curricula, and colleges offer certificate courses in a variety of alternative therapies (University of York Department of Health Sciences, 2008). **Integrative medical programs** are being developed to provide health care consumers with access to both allopathic and complementary practitioners. In some institutions, for example, nurses practise massage, reiki, and therapeutic touch.



Figure 34-1 Massage therapy can effectively relieve tension.



Figure 34-2 Young adults participating in dance therapy.

► BOX 34-1 Categories of Complementary and Alternative Medicine (CAM) Therapies

Whole Medical Systems

Alternative medical systems encompass both theories and practices. Often, they evolved earlier than the conventional Western medical approach. Examples of alternative medical systems that have developed in Western cultures are homeopathic medicine and naturopathic medicine. Systems that have developed in non-Western cultures include traditional Chinese medicine and Ayurveda (which originated in India).

Mind-Body Interventions

Mind-body interventions use a variety of techniques designed to enhance the mind's capacity to affect bodily function and symptoms. Some techniques that were considered CAM in the past have become mainstream (e.g., patient support groups and cognitive-behavioural therapy). Other mind-body techniques that are still considered CAM are meditation, prayer, mental healing, art therapy, music therapy, and dance therapy.

Biologically Based Therapies

Biologically based therapies use substances found in nature, such as herbs, foods, and vitamins. Examples are dietary supplements, probiotics, herbal products, and other so-called natural but as yet scientifically unproven therapies (e.g., shark cartilage to treat cancer). Some uses of dietary supplements have been incorporated into conventional

medicine. For example, folic acid is used to prevent certain birth defects, and a regimen of vitamins and zinc can slow the progression of age-related macular degeneration, an eye disease that can lead to vision loss.

Manipulative and Body-Based Therapies

Manipulative and body-based therapies include a broad range of Eastern and Western movement therapies designed to improve overall well-being. Examples are massage therapy, chiropractic or osteopathic manipulation, and Feldenkrais.

Energy Therapies

Energy therapies involve the manipulation of energy fields to affect health. Energy therapies can be divided into two types:

- Biofield therapies are intended to affect the energy fields that purportedly surround and penetrate the human body. The existence of such fields has not been scientifically proven. Biofield therapies involve applying pressure or manipulating the body by placing the hands in or through these fields. Examples of biofield therapies are qigong, reiki, and therapeutic touch.
- Bioelectromagnetism-based therapies involve the unconventional use of measurable electromagnetic fields, such as pulsed, magnetic, or alternating or direct current fields.

Source: National Institutes of Health, National Center for Complementary and Alternative Medicine. (Updated November, 2010). *What is complementary and alternative medicine?* (NCCAM publication no. D347). Retrieved from <http://nccam.nih.gov/health/whatiscam/>.

► TABLE 34-1 Complementary and Alternative Therapies

Types	Mechanism or Philosophy of Action
Whole Medical Systems	
Ayurveda	This traditional Hindu system of medicine dates to ancient India. Ayurveda practitioners use a combination of remedies, such as herbs, purgatives, and oils, to treat disease.
Latin American practices	The curanderismo medical system includes a humoral model (the model used by Hippocrates to explain disease) for classifying food, activity, drugs, illnesses, and a series of folk illnesses.
Traditional Aboriginal medicine	This healing practice promotes harmony within a community and in the physical and spiritual worlds through sweating and purging, herbal remedies, and shamanic healing.
Naturopathic medicine	This system of therapeutics is based on natural foods, light, warmth, massage, fresh air, regular exercise, and avoidance of medications. Naturopathic medicine recognizes the body's inherent healing abilities. The treatments integrate traditional natural therapies with modern diagnostic sciences and may include botanical (plant) medicine.
Traditional Chinese medicine	These traditional and systematic techniques and methods promote health and treat disease through acupuncture, herbal remedies, massage, acupressure, qigong (balancing energy flow through movement), and moxibustion (the use of heat from burning herbs). The fundamental concepts of traditional Chinese medicine are embedded in Taoism, Confucianism, and Buddhism.
Biologically Based Therapies (Natural Health Products)	
Herbal remedies	These supplements contain a plant, plant part, or herb that is used singly or in mixtures to convey a health or therapeutic benefit.
Homeopathic medicines	This system of medicinal treatments is based on the theory that certain diseases can be cured with small doses of substances that, in a healthy person, would produce symptoms similar to the symptoms of disease. The prescribed remedies are made from naturally occurring plant, animal, or mineral substances.
Vitamins and minerals (megavitamin therapy)	This therapy promotes the increased intake of nutrients, such as vitamin C and beta carotene. The treatment focus is on cancer, schizophrenia, and certain chronic diseases, such as hypercholesterolemia and coronary artery disease.
Traditional medicines (Ayurvedic remedies) (traditional Chinese herbal remedies)	Ayurvedic remedies: Combinations of herbs, purgatives, and rubbing oils are used to treat disease. Herbs are considered the backbone of medicine. More than 50,000 medicinal plant species exist, many of which have been studied extensively.

Continued

► **TABLE 34-1** Complementary and Alternative Therapies—cont'd

Types	Mechanism or Philosophy of Action
Probiotics	These live microorganisms are orally administered to confer a protective benefit upon the immune system of the small intestine.
Amino acids, essential fatty acids (EFAs), and antioxidant supplements	These products are packaged as tablets or capsules that may have a beneficial effect on reducing the body's inflammatory response and limiting oxidative stress within the body.
Nutrition as Medicine	
Gerson therapy	This therapy advocates a low-salt, high-potassium organic diet of fruit juices, raw vegetables, and nutritional supplements, plus coffee enemas for detoxification. According to this therapy, disease is believed to be caused by the accumulation of toxic substances that disrupt the body's immune system. Gerson therapy is used primarily in the treatment of cancer.
Macrobiotic diet	This predominantly vegan diet (white meat fish, occasional fruits, seeds, and nuts) is believed to have anticancer properties. The diet consists of 40%–60% whole cereal grain, 20%–30% vegetables, 5%–10% beans.
Mediterranean diet	This diet, characteristic of people living in the Mediterranean region, is high in whole grains, nuts, fruits, vegetables, and omega-3 essential fatty acids. Following this diet is believed to produce a protective benefit for cardiac health and various inflammatory diseases.
Manipulative and Body-Based Therapies	
Acupressure	In this therapeutic technique, digital pressure is applied in a specified way on designated body points to relieve pain, produce analgesia, or regulate bodily function.
Chiropractic medicine	This therapy involves the manipulation of the spinal column and may include physiotherapy and diet therapy.
Feldenkrais method	This therapy is based on establishing good self-image through awareness and correction of body movements. The technique integrates the impact of physics on body movement patterns with how people move, behave, and interact.
Tai chi	This technique incorporates breath, movement, and meditation to cleanse, strengthen, and circulate vital energy and blood. Tai chi helps to stimulate the immune system and maintain balance.
Massage therapy	The manipulation of soft tissue through stroking, rubbing, or kneading increases the body's circulation and improves muscle tone and relaxation.
Simple touch	Touching the patient in appropriate, gentle ways stimulates connection, displays acceptance, and gives appreciation.
Mind-Body Interventions	
Aromatherapy	Essential plant oils are used to promote relaxation or stimulation, thereby enhancing overall well-being.
Art therapy	Art is used to reconcile emotional conflicts, foster self-awareness, and express frequently subconscious concerns.
Biofeedback	Instruments are used to provide a person with visual or auditory information about autonomic physiological body functions, such as muscle tension, skin temperature, and brain wave activity.
Breathwork	A variety of breathing patterns are used to relax, invigorate, or open the emotional channels.
Dance therapy	Dance is used to treat social, emotional, cognitive, or physical problems.
Hypnotherapy	The induction of trance states and the use of therapeutic suggestion are used to treat paralysis, headaches, addictions, pain, and phobias.
Imagery	This therapeutic technique is used to treat pathological conditions by concentrating on an image or series of images.
Labyrinth meditation	Labyrinths are ancient spiritual symbols found in almost every religious tradition. Walking the labyrinth is regarded as an ancient spiritual act of meditation, a time for reflection and prayer, and a pilgrimage.
Meditation	This self-directed practice relaxes the body and calms the mind by focusing on rhythmic breathing.
Music therapy	Music meets the physical, psychological, cognitive, and social needs of individuals with disabilities and illness. Music therapy is used to manage pain and to improve physical movement, communication, emotional expression, and memory.
Prayer therapies	A variety of techniques are used in many cultures to incorporate caring, compassion, love, and empathy. Prayer can be verbal or silent, a solitary or group activity, and can include chanting, visualizations, and rituals.
Psychotherapy	Mental and emotional disorders are treated by the use of psychological techniques.

► TABLE 34-1 Complementary and Alternative Therapies—cont'd

Types	Mechanism or Philosophy of Action
Yoga	Exercise, postures, regulated breathing, and meditation are used to attain physical and mental well-being. The practice focuses on the body's musculature, posture, breathing, and consciousness.
Energy Medicine	
Qigong	Qigong is derived from the ancient Chinese practice of breathing, movement, and meditation and involves the assuming of basic postures. This practice is believed to promote strength, balance, and optimal body functioning. Qigong is used to treat stress-related conditions, fatigue, and musculoskeletal stiffness.
Reiki therapy	Derived from ancient Buddhist practices in which a practitioner places a hand on or above the body and transfers “universal life energy” to the patient, the energy from this therapy provides strength, harmony, and balance to treat health issues.
Therapeutic touch	In this therapy, a practitioner directs his or her balanced energies toward the energies of a patient by laying the hands on or close to a patient's body.

In Canada and worldwide, demand is growing for alternative medicines and the services of alternative health care providers (Andrews & Boon, 2005; University of York Department of Health Sciences, 2008). A study released by the Fraser Institute (2007) indicated that 54% of respondents had used at least one form of complementary or alternative therapy and that 74% of Canadians had used CAM at some point during their lifetimes. Commonly used therapies included massage, prayer, chiropractic care, relaxation techniques, and herbal therapies. In another Canadian study, people with asthma, diabetes, and migraine visited a CAM provider at a significantly higher rate than those within the general population (Metcalf et al., 2010). The Canadian Interdisciplinary Network for CAM Research (IN-CAM) was created in 2004 to foster CAM research and disseminate information. Objectives include providing information reflecting the Canadian perspective on the safety and efficacy of various CAM products and therapies.

Although CAM therapies are less expensive and less invasive than allopathic medicine, and their use could save the health care system money, patients (or their private insurance plans) must pay for these therapies. Therefore, many patients cannot afford CAM therapies. The individuals who use CAM therapies typically are women with a post-high school or college-equivalent education (Bardia et al., 2007).

Complementary and Alternative Medicine Therapies and Holistic Nursing

The practice of holistic nursing regards and treats the patient's mind, body, and spirit. Nurses can use holistic interventions such as relaxation therapy, imagery, music therapy, simple touch (especially helpful with older patients; Box 34-2), massage, and prayer (Box 34-3). Such interventions affect the whole person and are economical, noninvasive, nonpharmacological complements to traditional medical care. Holistic interventions can augment standard treatments, replace ineffective or debilitating interventions, and promote and maintain health (Dossey & Keegan, 2013). The Canadian Holistic Nurses Association develops standards of practice for holistic nursing and promotes holistic nursing practice, education, research, and administration (Canadian Holistic Nurses Association, 2008).

Growing appreciation for the importance of healing both the spirit and body has influenced the development of such

BOX 34-2 FOCUS ON OLDER ADULTS

- Touch is a primary need and is as necessary to humans as food, growth, and shelter. Touch refers to a broad range of techniques for the purpose of assisting the recipient toward optimal health (Keegan & Shames, 2005).
- Older adults need touch as much as, or more than, any other age group. However, skin hunger or poverty of touch can be acute among older adults, who often have fewer family members or friends to touch them.
- Simple touch can be an enhanced form of communication when the other senses are reduced (Dossey & Keegan, 2013).
- Simple touch helps older adult patients feel more connected to their environment and accepted by those around them. The act of touching can enhance the older patient's self-esteem and sense of worth.



hospital programs as music therapy, art therapy, and recreation therapy. At the University of Alberta Hospital in Edmonton, the Artists on the Wards program connects local artists with individual patients at the bedside. This program helps patients develop their creativity, which may aid physical, spiritual, emotional, and mental healing. The hospital also houses the McMullen Art Gallery (Figure 34-3). Many hospitals now provide space for spiritual practice, and chaplains are widely regarded as part of the health care team. For instance, the University of Alberta Hospital offers patients and families both a chapel and a teepee. The teepee, built specifically for Aboriginal patients and their families, is used for prayer, reflection, and healing ceremonies (Figure 34-4). A few hospitals have or are considering the construction of labyrinths on their grounds. Patients and visitors can use these labyrinths for walking, meditation, and prayer (see Table 34-1).

The following sections discuss several types of complementary and alternative medicine therapies. The therapies are organized into two types. The first are nursing-accessible therapies. These are therapies that you can begin to learn and apply in patient care. The second type includes training-specific therapies, such as chiropractic therapy or acupressure, which a nurse cannot perform without additional training. Some of these therapies also require certification.

BOX 34-3 RESEARCH HIGHLIGHT

Tai Chi as an Intervention to Improve Balance and Reduce Falls in Older Adults

Research Focus

Tai chi is a traditional Chinese martial art that involves slow, rhythmic, and gentle movements designed to promote the unrestricted and peaceful flow of energy throughout the body. Studies suggest that tai chi may improve balance and reduce falls in older adults. Loss of muscle mass and strength can decrease balance and increase the risk of falls, and falls are the leading cause of injury in older individuals. Physical exercise programs for the elderly that are safe and effective should be part of health promotion because of the beneficial effects of exercise on posture, balance, and strength.

Research Abstract

Leung et al. (2011) conducted a meta-analysis of 13 randomized controlled trials to determine if tai chi improved balance and reduced falls in the elderly. All studies compared those practising tai chi to control groups receiving no treatment. A total of 2151 individuals participated in these trials, and while most of them were healthy, some had osteoporosis and osteoarthritis. Different styles of tai chi and length and duration of the programs varied. Fall counts were measured and various balance outcome measures were utilized. Based on this large review, it was concluded that tai chi reduced falls and improved balance in older, non-frail adults.

Evidence-Informed Practice

- Nurses caring for aging adults are in an ideal position to assess and recommend specific exercise and movement activities that would be most beneficial for their patients.
- Tai chi is regarded as an easy-to-follow and enjoyable exercise that can be recommended as a safe exercise modality.
- Proper screening for frailty in the older adult should be done prior to participating in a tai chi program, and nurses can determine the appropriateness of this modality for their patients.
- Nurses are a reliable source for determining if patient outcomes for tai chi exercise and movement are successfully achieved.

Reference: Leung, D., Chan, C., Tsang, H., Tsang, W., & Jones, A. (2011). Tai Chi as an intervention to improve balance and reduce falls in older adults: A systematic and meta-analytical review. *Alternative Therapies in Health and Medicine*, 17(1), 40–49.

Nursing-Accessible Therapies

Some CAM therapies and techniques use natural processes, such as breathing, concentration, and simple touch, to help patients feel better and cope with their chronic conditions. You can learn these techniques with minimum preparation, and many of these procedures can be used with patients as an independent nursing practice (Dossey & Keegan, 2013). Adequate assessment and the patient's permission are prerequisites for implementing these therapies. Some CAM therapies may alter physiological responses such that physician-prescribed therapies (e.g., drug doses) may need to be changed. CAM therapies should be chosen according to the patient's functional status, beliefs or religious perspectives, access to health care, and insurance coverage (Box 34-4).

These therapies are designed to teach patients how they can change their behaviour to alter their physical responses to stress and relieve such symptoms as muscle tension, gastrointestinal discomfort, pain, and sleep disturbances. One of the



Figure 34-3 McMullen Art Gallery, University of Alberta Hospital, is open to visitors, staff, and patients. **Source:** Courtesy of the University of Alberta Hospital, Edmonton, Alberta.



Figure 34-4 This teepee outside the University of Alberta Hospital in Edmonton is available for prayer, meditation, and sacred ceremony. **Source:** Courtesy of the University of Alberta Hospital, Edmonton, Alberta.

principles of these therapies is that the individual must be actively involved in the treatment. Patients achieve better responses if they practise the techniques or exercises daily. The patient must commit to implementing and maintaining the therapy until a desired outcome is achieved.

BOX 34-4 NURSING STORY

A Holistic Approach to Health

At the Integrative Medicine clinic, you are the nurse responsible for completing initial assessments and for counselling and advising new patients about complementary and alternative therapies during their first visit. Today, you meet Mrs. L., a 48-year-old woman, who is employed as a teacher. She has come to the clinic after multiple unsuccessful attempts to lose weight. Her current body mass index (BMI) is 32, which indicates obesity. She decided to visit the clinic after discovering that her latest serum glucose and cholesterol levels are elevated. She is considering gastric bypass surgery for permanent weight loss. Her primary reason for visiting the clinic is to learn what she can do to lose weight and to gain control of her health without undergoing a surgical intervention.

Key Points

Past history: Mother has hypertension and diabetes.

Social history: Relationships with her children and husband are strong. She attends church regularly and feels strongly connected to her faith.

Medications: She takes many herbal remedies and supplements for weight loss.

Attitude toward health: She cries during the interview and expresses anger about her perceived inability to take control of her health. She finds her occupation and family activities stressful; she has little time or energy left at the end of the day.

Approaches

First, ask some important questions. What is the patient's medical diagnosis? Is it correct? Could other medical problems be contributing

to her obesity? Have all the conventional medical therapies been thoroughly explored or considered? Has she discussed with her primary health care provider any other treatment plans? It is important to explore the patient's attitude, frame of mind, coping strategies, support systems, and goals. You also need to assess safer alternatives for achieving weight loss and her willingness to participate in them. One key element in her social history is her strong relationships with her family members and her faith. She will need to connect with those support systems to meet her weight loss goals within the larger context of improving the family's nutrition and health. Together with Mrs. L., you can explore practical steps that her family can take to help her meet her weight loss goals, such as purchasing groceries, planning and contributing to the preparation of healthy meals, and making time to exercise regularly. These elements must be combined with realistic weight loss guidelines, including a structured follow-up. Review the herbal and dietary supplements she uses and emphasize the importance of sharing this information with her primary health care provider to determine whether the supplements are beneficial or harmful to her health. You have a good opportunity to inform Mrs. L. about how to choose her supplements wisely. In developing her plan of care, create a realistic weight loss program that combines the benefits of exercise and other mind-body therapies, including journal writing, guided imagery with visualization, meditation (e.g., through a prayer group at her church); other helpful resources might include appropriate self-help books, weight loss and recipe books, and Web site resources that can provide her with more insight and information into the psychological, physical, and lifestyle challenges associated with losing weight effectively and permanently.

Relaxation Therapy

People are exposed to stressful situations in everyday life that evoke the **stress response** (see Chapter 29). The biochemical functions of major organ systems are modulated by the mind. Thoughts and feelings influence the production of chemicals (i.e., neurotransmitters, neurohormones, and peptides) that circulate in the body and convey messages to various body systems. Physiologically, the stress response can cause increased heart, respiratory, and metabolism rates; tightened muscles; and a general sense of foreboding, fear, nervousness, irritability, and negative mood. Other physiological responses include elevated blood pressure, dilated pupils, stronger cardiac contractions, and increased levels of blood glucose, serum cholesterol, circulating free fatty acids, and triglycerides. Although these responses effectively prepare a person for short-term stress, long-term stress can cause structural damage and chronic illness, such as angina, tension headaches, cardiac arrhythmias, pain, and ulcers (Dossey & Keegan, 2013).

Relaxation is a state of overall decreased cognitive, physiological, and behavioural arousal. The process of relaxation reduces the neural impulses sent to the brain, thus decreasing the brain's activity. Relaxation is characterized by decreases in heart and respiratory rates, blood pressure, and oxygen consumption and increases in muscle relaxation and alpha-wave brain activity. Relaxation can be achieved by using a variety of techniques that incorporate a repetitive mental focus and the adoption of a calm, peaceful attitude (Benson, 1975). Teaching strategies for relaxation are listed in Box 34-5.

Relaxation helps individuals develop cognitive skills to reduce negative responses to situations. Cognitive skills

include focus (the ability to identify, differentiate, and return attention to simple stimuli for an extended period), passivity (the ability to stop unnecessary goal-directed and analytical activity), and receptivity (the ability to tolerate and accept experiences that may be uncertain, unfamiliar, or paradoxical). By practising relaxation therapy, the patient learns to monitor and consciously release tension.

Progressive relaxation involves teaching individuals to effectively rest and to reduce their physical tension. The patient learns to detect subtle localized sensations of muscle tension in one muscle group (e.g., the forearm muscle). In addition, the patient learns to differentiate between high-intensity tension (strong fist clenching) and subtle tension (Dossey & Keegan, 2013). Progressive relaxation is then practised using different muscle groups. One active progressive relaxation technique involves the use of slow, deep abdominal breathing while tightening and relaxing an ordered succession of muscle groups. When guiding a patient, you may choose to begin with the muscles in the face, followed by the muscles in the arms, hands, abdomen, legs, and feet.

Passive relaxation involves teaching individuals to relax muscle groups without first actively contracting the muscles. One passive relaxation technique incorporates slow, abdominal breathing exercises with imagining warmth and relaxation flowing through specific muscle groups; muscle tension is then released during expiration. Passive relaxation is useful for patients who find that active muscle contracting leads to discomfort or exhaustion.

Clinical Applications of Relaxation Therapy. Relaxation techniques can lower heart rate and blood pressure,

BOX 34-5 PATIENT TEACHING

Relaxation

Objective

- The patient will demonstrate decreased anxiety, tension, and other manifestations of the stress response as a result of the relaxation intervention.

Teaching Strategies

Meditation and Rhythmic Breathing (Eliciting the Relaxation Response)

- Provide a quiet environment.
- Help the patient to a comfortable position, either seated or lying on the back. Have the patient remain as still as possible and encourage movement only if necessary to remain comfortable.
- Instruct the patient to close the eyes and to maintain a receptive attitude: for example, by repeating silently, "Nothing is more important for me to do for the next 15 minutes" or "What will be, will be."
- Instruct the patient to breathe in and out, slowly and deeply, by using the abdominal muscles and keeping the chest still.
- At the beginning of every exhalation, have patient repeat the number "1" silently in his or her mind. Continue for a period of meditation.
- Explain that when the mind wanders, the patient should acknowledge this and refocus attention by again slowly counting on the exhalation.
- Have the patient practise for 5, 10, 15, or 20 minutes per session. Practise daily for at least one session.

Progressive Relaxation

- Follow steps 1, 2, 3, and 4 of meditation and rhythmic breathing.
- When the patient is breathing slowly and comfortably, instruct the patient to tighten and relax an ordered succession of muscle groups, tensing them and then relaxing them.
- Instruct the patient to tense and then relax the calves, then the knees, and so on.

Relaxation by Sensory Pacing

- Follow steps 1, 2, 3, and 4 of meditation and rhythmic breathing.
- Instruct the patient to slowly repeat and finish each of the following sentences, either in a low voice or silently:
Now I am aware of seeing ...
Now I am aware of feeling ...
Now I am aware of hearing ...
- Instruct the patient to repeat and complete each sentence four times, then three times, then twice, and finally once.

Relaxation by Colour Exchange

- Follow steps 1, 2, 3, and 4 of meditation and rhythmic breathing.
- Instruct the patient to notice any tension, tightness, aches, or pains in the body and to give that sensation the first colour that comes to mind.
- Instruct the patient to breathe in pure white light from the universe and to send the light to a tense or painful place in the body, letting the white light surround the colour of the discomfort.
- Instruct the patient to exhale the colour of the discomfort and let the white light take its place.
- Instruct the patient to continue breathing in the white light and exhaling the colour of the discomfort, allowing the white light to fill the entire body and bring about a sense of peace, well-being, and energy.

Modified Autogenic Relaxation

- Follow steps 1, 2, 3, and 4 of meditation and rhythmic breathing.
- Instruct the patient to repeat each of the following phrases silently four times, saying the first part of the phrases while inhaling for 2 to 3 seconds, holding the breath for 2 to 3 seconds, then saying the last part of the phrases while exhaling for 2 to 3 seconds.

Breathing in

I am
My arms and legs
My heartbeat
My breathing
My abdomen
My forehead
My mind

Breathing out

relaxed.
are heavy and warm.
is calm and regular.
is free and easy.
is loose and warm.
is cool.
is quiet and still.

Relaxing With Music

- Ask the patient to select pleasing, slow, quiet music
- Instruct the patient to find a comfortable position (either sitting or lying down but with arms and legs uncrossed) and to close the eyes and listen to the music.
- Instruct the patient to imagine floating or drifting with the music.

Evaluation

- Assess the patient's vital signs, particularly the respiratory pattern.
- Ask the patient to describe the level of tension or uneasiness felt.
- Observe the patient for the presence of behaviours that display anxiety.



decrease muscle tension, improve perceived well-being, and reduce symptom distress in individuals experiencing a variety of situations (e.g., complications from medical treatment or grieving the loss of a significant other) (Hui et al., 2006; Kaushik et al., 2006). The type of relaxation intervention should be matched to the individual's functional status, the energy expenditure of the relaxation technique, and the motivation of the individual for frequent practice.

Relaxation therapy, either alone or in combination with deep breathing, imagery, yoga (Figure 34-5), and music, has been shown to reduce pain (Gustavsson & von Koch, 2006; Medlicott & Harris, 2006; Norrbrink et al., 2006), alleviate tension headaches (Kanji et al., 2006), and help to diminish anxiety related to HIV (Kemppainen et al., 2006). The practice of relaxation techniques also facilitates burn care (de Jong & Gambel, 2006), helps patients deal with post-traumatic stress (Stapleton et al., 2006), and improves cognition in healthy

aging adults (Galvin et al., 2006). More studies, however, are needed to validate the effects of relaxation therapy. For example, studies could test other variables or activities that may also lead to both reduced physiological activity and lower levels of pain to determine whether an individual's improved response is due to the relaxation therapy alone. Such variables may include a healthy support network, a positive attitude that includes the use of humour, and other behavioural therapies, such as yoga and tai chi.

Relaxation therapy is a valuable technique because it enables individuals to exert some control over their lives. The practice of relaxation techniques may help patients to experience a decreased feeling of helplessness and a more positive psychological state overall, thereby helping them to regard their situation less negatively.

Limitations of Relaxation Therapy. Some patients who use relaxation therapy have reported fearing a loss of

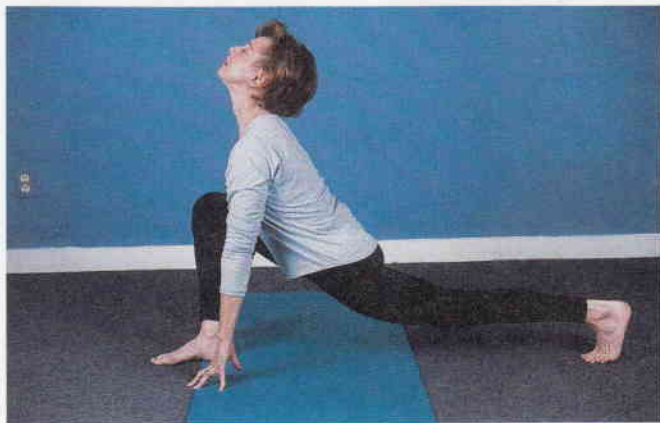


Figure 34-5 Yoga focuses on muscles, posture, breathing, and consciousness.

control, feeling like they are floating, and experiencing anxiety related to these feelings. Relaxation training teaches individuals to distinguish between low and high levels of muscle tension. During the first months of training, when learning to focus on sensations and tension, some patients report increased sensitivity in detecting muscle tension. Usually these feelings abate with training; however, you should monitor patients for worsening symptoms and for the development of new symptoms (Dossey & Keegan, 2013).

When choosing which relaxation technique to use, consider the physiological and psychological status of the patient. Patients with advanced diseases, such as cancer, may seek relaxation training to reduce their stress response; however, techniques such as active progressive relaxation training require a moderate expenditure of energy, which can amplify a person's existing fatigue and limit the ability to complete individual relaxation sessions and practice. Therefore, active progressive relaxation is not appropriate for patients with advanced disease or with decreased energy reserves. For these individuals, passive relaxation or imagery is more appropriate.

Meditation and Breathing

Meditation is any activity that limits stimulus input by directing the attention to a single unchanging or repetitive stimulus (Rakel & Faass, 2006). Meditation is a general term that refers to a range of practices that relax the body and still the mind. The root word, *meditari*, means "to consider." In 1975, Dr. Herbert Benson's book *The Relaxation Response* drew the attention of Western health care practitioners to the physical and psychological benefits of relaxation. As Benson noted, the components of meditation are simple: a quiet space, a comfortable position, a receptive attitude, and a focus of attention. He described meditation as a process that anyone can use to calm down, to cope with stress, and, for those with spiritual inclinations, to feel at one with God or the universe. Meditation is compatible with most religious traditions and can be practised alone or in groups. Most meditation techniques involve slow, relaxed, deep, usually abdominal, breathing (see Box 34-5). Meditation evokes a restful state, lowers oxygen consumption, reduces respiratory and heart rates, and decreases anxiety.

Clinical Applications of Meditation. Many conditions are indications for meditation (Box 34-6). Evidence has shown that meditation improves breathing patterns in patients with asthma, manages stress-related illnesses, and lowers blood pressure (Merkes, 2010; Paul-Labrador et al., 2006).

BOX 34-6 Indications for Meditation

- Anxiety or tension
- Chronic bereavement
- Chronic fatigue syndrome
- Chronic pain
- Drug abuse, alcohol abuse, tobacco use
- Hypertension
- Irritability
- Low self-esteem; self-blame
- Mild depression
- Psychophysiological disorders
- Sleep disorders

AIDS patients use meditation to reduce stress and anxiety (Brazier et al., 2006). Also benefiting from meditation are cancer patients (Zaza et al., 2005) and individuals with depression (Brown & Gerbarg, 2005). Battered women benefit from a meditation practice (Kane, 2006), as do those who have chronic low back pain (Mehling et al., 2005). Meditation also increases a person's productivity and sense of self, improves mood, and reduces irritability (Dossey & Keegan, 2013).

When considering the use of meditation for a patient, consider the patient's degree of self-discipline, although meditation actually requires less self-discipline than most other behavioural therapies.

Limitations of Meditation. Although meditation can have numerous physiological and psychological benefits, it may be contraindicated in some patients. For example, a patient with a strong fear of losing control may perceive meditation as a form of mind control and thus be resistant to learning the technique. Some patients respond well to meditation and require shorter sessions than the typical 15 to 20 minutes.

Meditation can also augment the effects of certain drugs. For example, individuals taking medications to treat hypertension, overactive or underactive thyroid glands, depression, or anxiety should be monitored. The prolonged practice of meditation techniques may, in some cases, lead to the reduced need for certain medications, and some doses of medications may need to be adjusted. Individuals learning meditation, therefore, should be monitored closely for physiological changes with respect to their medications.

Imagery

Imagery or visualization techniques, which are frequently used with relaxation training, help create mental images to stimulate physical changes, improve perceived well-being, and enhance self-awareness. Imagery can be either self-directed or guided by a practitioner (Dossey & Keegan, 2013). For example, the patient may be directed to begin slow, abdominal breathing while focusing on the rhythm of the breath. The patient is then guided to visualize ocean waves washing onto a shore with each inhalation, then receding with each exhalation. Next, the patient is encouraged to notice the smells, sounds, and temperatures that he or she is experiencing. As the session progresses, the patient may be instructed to visualize warmth entering the body during inspiration and tension leaving the body during expiration. Imagery scenarios can be individualized for each patient or left to the patient to develop.

Imagery can evoke powerful psychophysiological responses, such as alterations in the immune function (Fontaine, 2005). Many imagery techniques involve visual imagery, but they can also include the auditory, gustatory, and olfactory senses. For

BOX 34-7 PATIENT TEACHING

Creative Visualization

Objective

The patient will demonstrate skills in creative visualization.

Teaching Strategies

- Set goals that can be accomplished because confidence and increased self-esteem are achieved through success.
- Create clear images described in the present tense (e.g., imagine you are floating on a soft, white cloud).
- Frequently visualize the image. Visualization should be practised throughout the day but especially upon awakening or before sleep, when the mind is usually more relaxed.
- While focusing on the image, repeat encouraging statements, such as positive affirmations to alleviate doubts about the ability to achieve goals.

Evaluation

- Observe the patient for anxiety.
- Ask the patient whether the experience was helpful.
- Ask the patient whether he or she uses positive self-dialogue with visualization (e.g., "I am feeling stronger").
- Note whether the patient reports images of desired health habits, desired feelings, and desires for healing.
- Note whether the patient reports improved coping with daily stressors.



Figure 34-6 Biofeedback monitoring. Electrodes are placed on the frontalis and trapezius muscles and on the fingers of the left hand. Pneumograph measurements are also made.

example, visualizing a lemon being sliced in half and squeezing the lemon juice under the tongue has been observed to produce increased salivation as effectively as the actual event. People typically respond to their environment according to the way they perceive it and according to their own visualizations and expectations. Therefore, individuals can learn to self-regulate their visualization experiences by selecting appropriate visualizations and expectations (Dossey & Keegan, 2013).

Creative visualization as first described by Gawain (2002) is a form of self-directed imagery that is based on the principle of mind-body connectivity (i.e., every mental image leads to physical or emotional responses). Patient teaching strategies for creative visualization are listed in Box 34-7.

Clinical Applications of Imagery. Imagery is used to control or relieve pain, to achieve calmness and serenity, and to visualize cancer cells being destroyed by immune system cells. Imagery is also used in the treatment of chronic conditions, such as asthma, hypertension, functional urinary disorders, menstrual and premenstrual syndromes, rheumatoid arthritis, and gastrointestinal disorders, such as irritable bowel syndrome (Dossey & Keegan, 2013; Fontaine, 2005).

Limitations of Imagery. Imagery has few side effects; however, it is probably one of the least clearly defined interventions and can range from being highly structured to consisting of spontaneous daydreams (Rakel & Faass, 2006).

Training-Specific Therapies

Training-specific therapies are CAM treatments that may be administered by nurses but only after the completion of a specific course of study and training. A nurse must have a certification, degree, or licence beyond a registered nursing degree to administer most of these therapies. Several training-specific therapies are recognized as effective and are

recommended by Western health care practitioners (e.g., biofeedback and therapeutic touch). Many other therapies have not yet been studied in a systematic way to establish effectiveness. Many of these unproven techniques are very popular in our society and are used by many persons from other cultures who now live in Canada. Many therapies have positive effects, but some have negative effects, too. Some may have harmful results when used with standard Western medical therapies. Therefore, you need to acquire knowledge of such treatments and to be aware of their possible harmful interactions.

Biofeedback

Biofeedback techniques are frequently used in addition to relaxation interventions to assist individuals in learning how to control specific autonomic nervous system responses. **Biofeedback** is a group of therapeutic procedures that use electronic or electromechanical instruments to measure, process, and provide information about neuromuscular and autonomic nervous system activity (Figure 34-6). This information, or feedback, is provided in physical, physiological, auditory, and visual measurements through a pneumograph. For example, patients may hear a sound if their pulse rate or blood pressure increases out of their therapeutic zone. Biofeedback practitioners help patients to develop awareness of and voluntary control over physiological responses (Rakel & Faass, 2006).

Biofeedback is considered to complement traditional relaxation programs because it can immediately demonstrate to patients their ability to control some physiological responses. Biofeedback also helps individuals to focus on and monitor responses in specific body parts. By providing immediate feedback for the stress relaxation behaviours that work most effectively, patients learn to control the physiological functions that are most difficult to control. Eventually, the patient will be aware of positive physiological changes without the need for instrument feedback. Biofeedback demonstrates to the patient the relationships between thoughts, feelings, and physiological responses.

Clinical Applications of Biofeedback. Biofeedback has numerous applications. It has successfully treated migraine headaches (Damen et al., 2006), other pain (Breuhl & Chung, 2006), stroke (Cristea et al., 2006), and a variety of gastrointestinal and urinary tract disorders (Chiarioni et al., 2005).

One of the most critical components of any behavioural program is adherence to the treatment regimen. Patients who are compliant with appointments, practice times, and goal setting tend to be the most successful.

Limitations of Biofeedback. Although biofeedback has demonstrated effectiveness in a number of patient populations, several precautions should be noted. During relaxation therapy and biofeedback sessions, repressed emotions or feelings may emerge, and patients may find they cannot cope with these emotions alone. For this reason, practitioners should be trained in traditional psychological methods or be able to refer patients to qualified professionals.

Therapeutic Touch

Therapeutic touch (TT) is a training-specific therapy that was developed in the 1970s by a nurse, Dr. Dolores Krieger. Although the philosophical and religious assumptions of TT differ from those of other Eastern healing modalities, both practices involve trained practitioners who attempt to direct their own balanced energies in an intentional and motivated manner toward the patient (Krieger et al., 1979).

TT consists of the practitioner's hands being placed either on or close to a person's body (Figure 34-7). The practitioner scans the patient's body and diagnoses areas of accumulated tensions. The practitioner then attempts to redirect these energies to bring the person's energy back into balance (Krieger, 1975; Krieger et al., 1979).

TT consists of five phases: centring, assessment, unruffling, treatment, and evaluation. Centring is the process whereby the practitioner becomes aware and fully present during the entire treatment. The next phase, assessment of the patient, involves the practitioner moving his or her hands (roughly 5 to 15 cm from the body) in a rhythmic and symmetrical movement from the head to the toes. During this phase, the practitioner notices the quality of **energy flow** and detects accumulations of energy. Physiological indicators of energy imbalance are perceived as congestion, pressure, warmth, coolness, blockage, pulling or drawing, or static or tingling (Krieger, 1975). During the third phase, the practitioner "unruffles" the energy flow or facilitates the symmetrical and rhythmical flow of energy through the body with long downward strokes over the energy field located over the entire body. This rebalancing of energy is achieved either by the practitioner touching the body or by

maintaining the hands in a position a few centimetres away from the body. The final phase consists of an evaluation of the patient and a reassessment of the energy field. If rebalance is achieved, the practitioner detects a more symmetrical, freely flowing energy field (Krieger et al., 1979).

Clinical Applications of Therapeutic Touch. Early studies found that TT was able to increase hemoglobin levels in several patients (Krieger, 1975; Krieger et al., 1979). This same positive result was found in a recent study (Movaffaghi et al., 2006). Other studies have found that TT reduced headache pain, improved the mood of bereaved adults, and reduced anxiety levels in hospitalized patients with cardiovascular disease (Krieger, 1975; Krieger et al., 1979).

Limitations of Therapeutic Touch. Although some studies have demonstrated that TT produces positive outcomes, others have not. TT may be contraindicated in certain patient populations. For example, patients who are sensitive to human interaction and touch (e.g., individuals who have been physically abused or have psychiatric disorders) may misinterpret the intent of the treatment and may feel threatened and anxious. Other patients who are sensitive to energy repatterning may also need to avoid TT. These patients include premature infants, newborns, children, pregnant women, older or debilitated people, and patients who are in critical, unstable conditions (Fontaine, 2005).

Chiropractic Therapy

Chiropractic therapy was developed in 1895 and has become the third-largest independently practised health profession in the Western world (Rakel & Faass, 2006). Chiropractors graduate from well-established preparatory programs similar to medical schools. The central tenet of the chiropractic profession is spinal manipulation directed at specific joints. Manipulation is defined as the forceful passive movement of a joint beyond its active limit of motion. Practitioners use either their hands or an instrument to manipulate the spine. Chiropractic therapy is considered a holistic therapy that does not typically use drugs or surgery.

The basic principles of chiropractic therapy incorporate the idea that human beings have an innate healing potential; harnessing this potential is the goal of this healing profession. Chiropractic therapy promotes both a natural diet and regular exercise as essential components for the body to function properly (Fontaine, 2005).

Clinical Applications of Chiropractic Therapy. The basic goals of chiropractic therapy focus on restoring the body's structural and functional imbalances that may result in pain. One of the major structural distortions that chiropractors treat is vertebral subluxation, in which joint mobility is decreased due to slight changes in the position of the articulating bones. A more severe form of subluxation, called fixation, exists when joint motion is restricted. Chiropractic interventions treat musculoskeletal abnormalities, headaches, dysmenorrhea, disorders of blood pressure, vertigo, tinnitus, and visual disorders (Rakel & Faass, 2006).

Limitations of Chiropractic Therapy. Several diseases or joint conditions should not be treated by manipulation. If a malignancy is suspected or determined through diagnostic testing, the patient should be referred to a medical physician for further evaluation and treatment. Bone and joint infections also require pharmaceutical or surgical intervention, and the structural integrity of the bone may be compromised if excessive force is used. Contraindications for chiropractic



Figure 34-7 In therapeutic touch, the practitioner's own energy is directed to help or heal another person.

▶ TABLE 34-2

Three Causes of Disease According to Traditional Chinese Medicine

Cause of Disease

External causes, or “the six evils”
Internal causes, or internal damage by seven effects
Nonexternal, noninternal causes

Influences

Wind, cold, fire, damp, summer heat, dryness
Joy, anger, anxiety, thought, sorrow, fear, fright
Dietary irregularities, excessive sexual activity, fatigue, trauma, parasites

therapy include acute myelopathy, fractures, dislocations, rheumatoid arthritis, and osteoporosis. Severe complications secondary to neck and spine manipulation are rare; however, some research suggests avoiding this type of manipulation on infants and children (Vohra et al., 2007).

Traditional Chinese Medicine

Traditional Chinese medicine (TCM) comprises several healing modalities, including herbal remedies, acupuncture, moxibustion, diet, exercise, and meditation. TCM is several thousand years old. A major concept in Chinese medicine is the **yin and yang**, which represent opposing, yet complementary, phenomena that exist in a state of dynamic equilibrium. Examples of yin and yang are night and day, hot and cold, and shady and sunny. Yin represents shade, cold, and inhibition, whereas yang represents fire, light, and excitement. Yin also represents the inner part of the body, specifically the viscera, liver, heart, spleen, lungs, and kidneys, whereas yang represents the outer part, specifically the bowels, stomach, and bladder. According to TCM, when an imbalance occurs in these paired opposites, disease can emerge (Fontaine, 2005).

Qi (pronounced *chee*) is defined as the body’s vital energy. Disease is classified into three major categories: external causes, internal causes, and neither internal nor external causes (Table 34-2). Regardless of the cause, when yin and yang are out of balance, the movement of qi is altered. The body has several forms of qi that directly influence its physiological functions and help maintain homeostasis.

Channels of energy run in regular patterns throughout the body and over its surface. These channels, called **meridians**, are like rivers flowing through the body. An obstruction of these meridians functions like a dam, by backing up the flow in one part of the body and restricting the flow in other parts, eventually leading to disease. Located along the channels are **acupoints**, or holes through which qi can be influenced by the insertion of needles, a process known as **acupuncture**.

Another important component of Chinese medicine involves five elements: earth, metal, water, wood, and fire. Various health phenomena are organized according to these elements and interact with each other. In Chinese medicine, outward manifestations reflect the internal environment. Two primary areas are assessed in Chinese medicine: the tongue and several pulses. The colour, shape, and coating of the tongue reflect the general condition of the internal organs. The pulses provide information about the condition and balance of qi, blood, yin and yang, and internal organs (Fontaine, 2005).

Acupuncture

Acupuncture is a method of stimulating certain points (acupoints) on the body by the insertion of special needles to



Figure 34-8 Acupuncture involves the insertion of special needles to regulate the flow of energy.

modify the perception of pain, normalize physiological functions, or treat or prevent disease (Figure 34-8). Acupuncture is used to regulate the flow of qi. According to Chinese traditional medicine, acupuncture needles unblock obstructed energy and re-establish the flow of qi through the meridians, thereby stimulating and activating the body’s self-healing abilities. The effects of the acupuncture needles may be enhanced by applying heat or weak electrical currents to the needles (Fontaine, 2005).

Clinical Applications of Acupuncture. Acupuncture is the primary treatment used by practitioners of Chinese medicine. Many allopathic physicians and health care providers are also trained and certified in acupuncture.

Acupuncture is used to treat low back pain, myofascial pain, headaches, tennis elbow, osteoarthritis, whiplash, and musculoskeletal sprains. Other problems that have been successfully treated are sinusitis, gastrointestinal disorders, menstrual symptoms, neurological disorders, chronic pulmonary diseases (including asthma), hypertension, smoking and other addictions, and clinical depression (Rakel & Faass, 2006).

Limitations of Acupuncture. Acupuncture is considered a safe therapy when the practitioner has successfully completed the appropriate training and uses sterilized needles. Although complications have been noted, they are rare if appropriate steps are taken to ensure the safety of the equipment and the patient. These complications include the puncture of an internal organ, bleeding, fainting, seizures, miscarriage, post-treatment drowsiness, and infections from contaminated or broken needles or from needles that have been left in place for an extended length of time.

Acupuncture should be used with caution in pregnant patients and patients who have a history of seizures, are hepatitis carriers, or are infected with HIV. Acupuncture treatment is contraindicated in people with bleeding disorders, thrombocytopenia, or skin infections.

Electroacupuncture should be avoided in people who have pacemakers, are pregnant, or have cardiac arrhythmias or epilepsy (Fontaine, 2005).

Role of Nutrition in Disease Prevention and Health Promotion

A growing body of scientific evidence over the past few decades has been exploring the relationship between **nutrition** and its preventive effect on disease. Substantial evidence from

epidemiological studies indicates that the relationship between nutrition and cancer, diabetes, and cardiovascular disease is often directly linked to lifestyle and nutritional choices.

Current scientific research relates diet and nutrition to cancer risk (Berkow et al., 2007; Chan et al., 2006; Webb & McCullough, 2005). The research findings are conclusive enough for some investigators to suggest that further research should focus on developing protective nutritional strategies against cancer, especially because of people's increasing exposure to environmental carcinogenic agents and because of the aging of populations worldwide (Dinkova-Kostova, 2007; Thorogood et al., 2007). Canadians typically consume a diet lacking in foods of plant origin (fruits and vegetables) and high in fat, including refined and processed foods with little or no nutrient value. Consequently, rates of obesity are rising in our country, particularly for young children. The prevalence of diseases such as type 2 diabetes, which previously was rarely seen in young children, is now increasing in this population.

Studies show that increased intake of whole grains and dietary fibre is inversely associated with insulin resistance and type 2 diabetes (Li & Uppal, 2010). Coronary heart disease is a leading cause of death and is related to lifestyle choices, including overeating, inactivity, and poor diet choices. The value of nutrition has become clear, evidenced by studies that have found strong correlations between what researchers identify as Western diseases (e.g., coronary artery disease, obesity, unhealthy dietary habits) (Berkow et al., 2007). Research has shown that the primarily plant-based Mediterranean diet, which is rich in fruits, vegetables, and fish, reduces the risk of heart disease. Dean Ornish et al. (1998) determined that intensive lifestyle and dietary changes could, in fact, reverse coronary artery disease. Research is ongoing, but numerous studies indicate that attention to diet and to factors such as weight and exercise has been proven to reduce cancer risk. In addition, current research is examining the complex relationships between specific food components and their health effects. Whole foods (foods that are raw, unrefined, and minimally processed) provide more nutrients than can be obtained from supplements. A single fruit or vegetable contains many protective chemicals and nutrients that cannot be sourced from a supplement alone. These plant chemicals, commonly called *phytochemicals*, work together to provide a better defence against disease. Phytochemicals provide pigment and flavour; they give garlic its pungent taste and give fruits and vegetables their bright and varied colours (Bragdon & Scroggs, 2006).

Phytochemicals are antioxidants, which are compounds that protect cells from damage. Antioxidants destroy free radicals, which are chemicals that are produced when the body uses oxygen. Free radicals can damage cells, thereby leading to the mutations that cause cancer. Several phytochemicals are being studied to determine how they influence the cancer process (Bragdon & Scroggs, 2006; Milner, 2006).

The Canadian Cancer Society (2011) addresses some key dietary sources of phytochemicals that are optimal for health and disease prevention and advise choosing a food from each colour group every day. Colour groups and some examples of their foods include dark green and orange (carrots, spinach, oranges); red and blue or purple (beets, red peppers, blueberries); and white, brown, and tan (cauliflower, garlic, bananas). In association with the Canadian Cancer Society, Beliveau and Gingras (2006) have written a book that addresses how a healthy diet can prevent disease and offers recipes geared toward preventing cancer.

Despite the lack of conclusive data that dietary changes can prevent cancer, sufficient evidence exists to suggest that cancer risk can be reduced by eating more fruit, vegetables, and whole foods. Cancer is a complex group of diseases with many causes not related to diet alone but to a combination of individual and general risk factors. Because of the relationship of diet to many other lifestyle diseases, the best approach to nutrition may be to focus on a well-balanced, whole-food approach rich in disease-fighting phytochemicals.

Herbal Therapies

An estimated 25,000 plant species are used medicinally throughout the world. **Herbal therapy** is the oldest form of medicine; archeological evidence suggests that Neanderthals used herbal remedies 60,000 years ago. Herbal therapy was widespread for thousands of years, but its popularity declined with the development of modern scientific medicine in the early eighteenth century. However, because approximately 80% of the world's population lives in developing countries, herbal medicine constitutes a prominent approach to health care worldwide. In countries that use predominantly allopathic medicine, an increased interest in herbal medicine has developed from consumer interest in natural foods and growing concern about the complications and limitations of scientific medicine (Fontaine, 2005).

Herbal substances are extracted from plants, animals, and minerals. The active ingredients are prepared in tinctures or extracts, elixirs, syrups, capsules, pills, tablets, lozenges, powders, ointments or creams, drops, and suppositories. Many people think, incorrectly, that because herbs are natural plants, they cannot cause harm or side effects. As with other medications, some herbal substances contain powerful chemicals and should be examined for interaction and compatibility with other prescribed or unprescribed substances. As well, many herbs are sold with claims that they can "cure" certain ailments when their efficacy has not been determined through clinical trials. In a study on herbal remedies for psoriasis (Steele et al., 2007), the magnitude of information on the Internet (more than 1 million sites offered by Yahoo! versus 31 articles found in the medical literature) illustrates the lack of scientific evidence to support the many uses of herbal remedies. Herbs are, in general, classified as beneficial, harmful, or neutral, in which case they have no effects on the specific ailment.

The philosophy of herbal therapy differs from the philosophy of conventional drug therapy. The goal of herbal therapy is to restore balance within the individual by facilitating the self-healing ability. Drug therapy, on the other hand, is aimed at the treatment of a specific disease or symptoms. Herbal therapy is also prescribed on an individual basis with unique herbal concoctions tailored for each person. Many herbal medicines are sold as food, food supplements, or natural health products in health food stores and through private companies.

According to the Canadian *Food and Drugs Act*, all drugs must be proven safe and effective before being sold to the public. A Health Canada (2005) survey revealed that of 2004 persons surveyed, 71% had used a natural health product.

Health Canada regulates all over-the-counter **natural health products** (NHPs) for safety, effectiveness, and quality. NHPs are considered to be any product derived from a plant, animal, or microorganism (e.g., herbs, probiotics, essential fatty acids) and vitamins, minerals, and homeopathics that are, in the words of the Act, used to "diagnose, treat, prevent disease; restore or correct function, maintain or promote health." These

regulations include good manufacturing practices and guidelines for obtaining a product licence. NHPs that have been approved for sale under the new regulations have been assigned a Drug Identification Number (DIN; DIN-HM for homeopathic medicines) or natural product number (NPN). These numbers certify that the product has passed a review of its formulation, labelling, and instructions for use. Health Canada advises Canadians to use only health products that carry a DIN, DIN-HM, or NPN on the label.

Clinical Applications of Natural Health Products (NHPs)

Numerous natural health products have been determined to be safe and effective for a variety of conditions (Table 34-3).

Milk thistle, for example, can effectively treat certain liver and gallbladder conditions; its antioxidant properties are believed to protect the liver and facilitate regeneration of liver cells. St. John's wort has been found to be effective as a tricyclic antidepressant agent and more effective than placebo (Linde et al., 2008).

Limitations of NHPs. Although NHPs have been shown to provide beneficial effects for a variety of conditions, a number of problems may exist. Concentrations of active ingredients can vary considerably, and contamination may occur with prescription medications and other herbs or chemicals, including pesticides and heavy metals. Some herbs have also been found to contain toxic products that can cause cancer. Comfrey, for example, has been used for its wound-healing

► **TABLE 34-3** Natural Health Products in Common Use and Considered Safe

Common Name	Effects	Indications*	Warnings†	Other
Black cohosh	Estrogen-like effects	Menopausal hot flashes Premenstrual syndrome	Significant estrogenic activity has not been found but not recommended if patient has a history of breast cancer	Is promising for the relief of moderate hot flashes related to menopause
Chamomile (German or Hungarian)	Topically: Anti-inflammatory Orally: Anti-inflammatory, antiestrogenic effects	Chemotherapy-induced mucositis Dyspepsia Colic Inflammatory conditions Insomnia Menstrual disorders	Contraindicated if allergies to the daisy family May potentiate the effect of anticoagulants and CNS depressants	Avoid confusion with Roman chamomile
Echinacea	Topically: Anaesthetic and anti-inflammatory, wound healing Orally: Stimulates the immune system	Upper respiratory infections Colds Urinary tract infections	Contraindicated in patients receiving cancer treatments and for people with autoimmune diseases, multiple sclerosis, tuberculosis, diabetes, asthma, leukemia, HIV/AIDS, lupus, or allergies to the daisy family Not to be used longer than 8 weeks	Chemical constituents differ among roots, leaves, and flowers
Evening primrose oil	Anti-inflammatory constituents omega-6 and gamma-linoleic acids	Mastalgia Atopic dermatitis Premenstrual syndrome (PMS) Menopausal hot flashes	Contraindicated in patients with seizure disorders Large doses may cause loose stools and abdominal pain	Studies have shown positive effects on relieving mastalgia (cyclic breast pain)
Fish oil	Omega-3 essential fatty acids are believed to have anti-inflammatory properties	Rheumatoid arthritis Rheumatoid arthritis Prevention of cardiovascular disease and cancer	Possible increase of INR with coumadin Avoid doses greater than 3 gm/day to avoid inhibiting blood coagulation Quality of product should be monitored for cancer-causing pollutants, such as dioxin and PCBs	Effective in reducing triglyceride levels The Mediterranean diet, which is rich in fish, has been associated with lower rates of cancers May improve overall cognitive functioning and behaviour in children with attention deficit-hyperactivity disorder (ADHD)

TABLE 34-3 Natural Health Products in Common Use and Considered Safe—cont'd

Common Name	Effects	Indications*	Warnings†	Other
Garlic	Major constituent allicin reduces oxidative stress and stimulates the immune system Inhibits platelet aggregation	Hypertension Cold and flu prevention Athlete's foot (topically)	May prolong bleeding time Possible interactions with anticoagulants Topical application may cause skin irritation	Supplementation not recommended for use during pregnancy due to its effect on bleeding time
Ginger	Antiemetic Antibiotic	Motion/morning sickness Nausea and vomiting Vertigo	May enhance the effects of coumadin, aspirin, and NSAIDs	Recent studies indicate no fetal harm when used for morning sickness
Ginkgo biloba	Contains flavonoids and organic acids that have anti-inflammatory/antioxidant effects Inhibits platelet-activating factor	Dementia Poor circulation Poor memory	Ingestion may increase the risk of serious bleeding, especially in patients taking anticoagulants or NSAIDs Can cause contact dermatitis High doses can cause seizures	Potential promise in enhancing cognitive functions in people with dementia and improving peripheral arterial disease
Glucosamine (Hydrochloride/sulphate)	Naturally occurring amino sugar that stimulates the synthesis of proteins responsible for cartilage growth and maintenance	Joint pain Osteoarthritis	May increase the anticoagulant effects of coumadin	Mounting evidence for pain reduction and disease-modifying effects in osteoarthritis
Milk thistle	Silymarin, the active constituent, is a potent inhibitor of tumour necrosis factor (TNF), which reduces toxicity to the liver and reduces inflammation	Chronic hepatitis Cirrhosis GI upset	Reports on significant decrease in fasting blood glucose in diabetics using conventional diabetic therapy	Do not confuse with Blessed Thistle Mixed evidence on effectiveness in managing hepatitis or cirrhosis
Saw palmetto	Androgen receptor blocker Anti-inflammatory	Benign prostatic hyperplasia (BPH) Urinary problems	Increased risk of bleeding if on anticoagulants	Evidence suggests that it provides mild to moderate improvement for urinary problems
St. John's wort	Inhibits reuptake of serotonin, dopamine, and norepinephrine neurotransmitters Wound healing (topical)	Depression Sedative Menopausal symptoms	Not appropriate for severe depression May enhance the effects of SSRIs and other antidepressants Significant interactions with many drugs and herbs Photosensitivity with chronic use	Studies support its use in treating mild to moderate depression
Valerian	Valepotriate constituents have sedative-hypnotic and smooth muscle effects	Muscle spasms Sleep disorders Restlessness	May cause headaches or gastrointestinal disturbances Patient must avoid using concurrently with other sedatives	Studies support its use in treating insomnia and improving sleep quality

INR, International normalized ratio; NSAIDs, nonsteroidal anti-inflammatory drugs; PCBs, polychlorinated biphenyls; SSRIs, selective serotonin reuptake inhibitors.

*Unless otherwise noted, these natural health products have not shown sufficient evidence to rate their effectiveness for all stated indications.

†Data do not support the use of these herbs in infants or children or during pregnancy or lactation.

Sources: Adapted from Skidmore-Roth, L. (2006). *Skidmore-Roth Mosby's herbs and natural supplements* (3rd ed.). St Louis, MO: Mosby; The Pharmacists Letter. (2010). *Natural medicines comprehensive database* (12th ed.). Stockton, CA: Therapeutic Research Faculty; and University of Maryland Medical Center. (2009). *Herbal medicine*. Retrieved from <http://www.umm.edu/altmed/articles/herbal-medicine-000351.htm>.

properties; however, various species of comfrey contain highly carcinogenic pyrrolizidine alkaloids and have produced liver cancer in small animals. Other unsafe NHPs are listed in Table 34-4.

Not all companies follow strict quality-control and manufacturing guidelines, which set standards for acceptable levels

of pesticides, residual solvents, bacterial levels, and heavy metals.

For this reason, NHPs should be purchased only from reputable manufacturers (Box 34-8). In addition, labels on herbal products should include the scientific name of the botanical, the name and address of the manufacturer, the batch or lot

► TABLE 34-4 Unsafe Natural Health Products

Common Name	Uses	Comments
Aconite (Aconitum, Blue Monkshood Root)	Pain and inflammation (arthritis, gout, etc.)	Contains alkaloids toxic to the heart and CNS
Coltsfoot (British tobacco, Coughwort)	Bronchitis Asthma Sore throat	Most common type of severe herbal poisoning in Hong Kong Contains large number of hepatotoxic pyrrolizidine alkaloids that can cause cancer
Comfrey (Blackwort, Slippery root)	Wound healing Gastritis Cancer	Contains large number of toxic hepatotoxic pyrrolizidine alkaloids that can cause cancer
Country Mallow (Heartleaf, White Mallow)	Asthma Colds and nasal congestion	Contains ephedrine similar to the stimulant ephedra, which can cause heart attack and seizure (unauthorized for sale as an NHP by Health Canada)
Greater Celandine (Celandine, <i>Chelidonium herba</i>)	Dyspepsia Irritable bowel syndrome (IBS) Gastric cancer	Over a dozen reports of hepatitis in several oral preparations
Ephedra Ma Huang, herbal Ecstasy	Weight loss Athletic performance enhancer	Unsafe for people with hypertension, diabetes, or thyroid disease due to stimulant effects Many interactions with herbs and drugs Health Canada (2005) advisory against use of any product containing this substance Banned in United States (2004)
Kava	Anxiety and stress Sleep aid	Hepatotoxicity and liver failure Issues related to contaminants in product Health Canada (2010) advisory against use
Lobelia (Asthma Weed, Indian Tobacco)	Asthma Bronchitis Whooping cough	CNS overstimulation may cause tachycardia, hypotension, and possibly death
Yohimbe	Used to treat impotence, as an aphrodisiac	May cause kidney damage, cancer, hypertension, and cardiac conduction disorders

Source: Adapted from Consumer Reports. (June 2010). *10 herbal supplements to avoid*. Retrieved from <http://www.consumerreports.org/health/natural-health/dietary-supplements/supplement-side-effects/index.htm>; and The Pharmacists Letter. (2010). *Natural medicines comprehensive database* (12th ed.). Stockton, CA: Therapeutic Research Faculty.

number, the date of manufacture, and the expiration date. If the product has been assessed by Health Canada for safety and effectiveness, it will also have a DIN-HM or NPN on its label.

Nursing Role in Complementary and Alternative Therapies

The integrative medicine approach is consistent with the nursing holistic approach. Indeed, many nurses already practise the use of simple touch. This therapy is an example of a holistic approach to care that includes a variety of practice modalities designed to promote the health and well-being of the patient. The use of these practice modalities is based on the assumption that nurses practise within the Scope of Practice, as defined by the Canadian Nurses Association (Canadian Holistic Nurses Association, 2008). As essential participants, nurses who provide CAM therapies must have the knowledge and skill necessary to provide care safely and ethically through self-study, certificate courses offered by community colleges, or study with expert practitioners. Nurses should understand provincial and territorial legislation regarding complementary therapies, practise within the scope of these laws, and be able to make appropriate recommendations about CAM therapies to allopathic primary care providers. Various nursing resources on CAM are available through the Canadian Holistic Nurses

Association. The College and Association of Registered Nurses of Alberta (2011) has developed a guide for registered nurses. These resources help you to understand your professional responsibilities, the ethics related to implementation and advisement of CAM, and the general implications for nurses.

You also need to keep abreast of the current research in the field of CAM therapy to provide accurate information to patients and other health care providers. For example, the Canadian Interdisciplinary Network for Complementary and Alternative Medicine Research has been created to foster excellence in CAM research (Andrews & Boon, 2005).

You should advise patients about the appropriate times to use conventional or CAM therapy. Patients often look to you for advice on the use of different therapies; therefore, you need to have knowledge of both the potential benefits and the risks associated with these therapies. For example, if a patient complains of right lower abdominal pain, nausea, and vomiting—signs of appendicitis—you should recommend an allopathic assessment. However, if the patient has a chronic gastrointestinal disorder and is diagnosed with irritable bowel syndrome, you may suggest the patient could benefit from relaxation therapy and herbal therapy. Because you work very closely with your patients, you are in a unique position to become familiar with patients' religious and cultural viewpoints. You may be able to determine which CAM therapies would be best suited to individual beliefs.

* BOX 34-8 FOCUS ON PRIMARY HEALTH CARE

Educating Patients About Purchasing Natural Health Products

Many people who buy NHPs are unaware of the lack of regulation regarding the manufacturing and sale of such products. It is difficult to make informed decisions when faced with hundreds of products. When patients choose to use NHPs, they should purchase these products only from reputable manufacturers to ensure safety, appropriate use, and response.

You can help patients make informed choices about NHPs by offering these guidelines:

- Avoid hype: Be wary of supplements that offer a “cure” or a “secret formula.”
- All product labels should indicate the following:
 - The scientific name of the botanical
 - The quantity, concentration, expiration date, and manufacturer's name
 - The purpose, dosage form, route of administration, and warnings of possible adverse reactions
 - The names of other key ingredients
 - The natural product number (NPN) or Drug Identification Number (DIN-HM), which indicates that Health Canada has reviewed its formulation

- Ensure the product is supported by published research. Avoid “multi-ingredient” formulations when possible; otherwise, determining potential reactions with other medicines will be difficult. Consumers often pay more for secondary products that may not be present in established therapeutic levels.
- Look for well-educated service staff who can answer consumers' questions.
- Be cautious about “mega” doses of anything: even excess ingestion of certain vitamins can be toxic.
- Be sceptical about cheap herbal remedies. Consumers must pay for the manufacturer's investments in ensuring quality and purity. Very inexpensive herbal products are often of inferior quality.
- NHPs used for weight loss, body building, sleep problems, and diabetes have become a worldwide problem due to the addition of prescription and nonprescription drugs. Purchasing unauthorized NHPs through the Internet may increase your risks for unsafe products.



You should encourage patients to inform all caregivers, including other health care providers, about the medications and therapies they receive. In particular, complete information about the use of NHPs should be added to the medical record to prevent potential drug and herb interactions.

❖ KEY CONCEPTS

- Complementary therapy is used in conjunction with allopathic medicine, whereas alternative therapy is generally used without the addition of conventional health care methods.
- Integrative medicine uses a multidisciplinary (both allopathic and complementary) treatment approach.
- Stress is an adaptive response that allows individuals to react to demanding situations.
- Chronic stress may be maladaptive, thereby leading to chronic muscle tension and changes in mood and immunity.
- Relaxation is a beneficial state characterized by improved mood, relaxed muscle tension, lowered blood pressure, and slower pulse and respiratory rates.
- To be most effective and to have prolonged beneficial outcomes, complementary and alternative medicine therapies require the patient's commitment and regular involvement.
- Complementary and alternative medicine therapies should be chosen according to the patient's functional status, belief or religious perspectives, access to health care, and insurance coverage.
- Some complementary and alternative medicine therapies may alter physiological responses, thereby requiring changes in routine medication doses.
- Imagery is usually visual but can also involve the auditory, gustatory, and olfactory senses.
- Many complementary and alternative medicine therapies lack a scientific basis but are thought to be effective on the basis of observed positive outcomes in a number of patients. Some complementary and alternative medicine therapies are

supported by research published in professional nursing and medical journals.

- Current research supports various nutritional practices that limit the development of lifestyle-specific diseases.
- Not all natural health products are safe.

❖ CRITICAL THINKING EXERCISES

Patient profile: Margaret is a 76-year-old Catholic woman who has received a diagnosis of a slow-growing renal tumour. Surgery is scheduled in two weeks, and Margaret is afraid of both the procedure and the outcome. Is it cancer? Will the surgery result in a disability?

1. What specific nursing-accessible complementary and alternative medicine interventions can you offer Margaret to prepare her for the surgery and reduce her anxiety?
2. After surgery, Margaret becomes depressed. What complementary and alternative medicine therapies may be appropriate to help her deal with her depression?

❖ REVIEW QUESTIONS

1. Despite the success of allopathic medicine (traditional Western medicine), many patients find complementary therapies provide relief for which of the following conditions?
 1. Heart disease and pancreatitis
 2. Ulcers and hepatitis
 3. Chronic back pain and arthritis
 4. Lupus and diabetes
2. Many complementary therapies, such as acupuncture, have diagnostic and therapeutic methods specific to their field. Which therapies can be easily learned and used as part of independent nursing practice?
 1. Massage therapy
 2. Chinese medicine
 3. Shamanism
 4. Imagery

3. Which of the following statements best describes the experience of Canadians who have used a complementary and alternative medicine therapy?
 1. Most used complementary and alternative medicine therapy to prevent illness or maintain wellness.
 2. Few found these therapies helpful.
 3. Most had their complementary and alternative medicine therapy is covered by medicare.
 4. Most are from lower socioeconomic backgrounds.
4. Which of the following does holistic nursing regard and treat?
 1. Mind, body, and spirit
 2. Disease, spirit, and family
 3. Desires and emotions
 4. Muscles, nerves, and spine disorders
5. After you complete your assessment of the patient, whose permission is required before you can implement a complementary and alternative medicine therapy?
 1. The patient's
 2. The physician's
 3. The family's
 4. No permission is required.
6. According to one of the principles of complementary and alternative medicine therapies, which of the following statements best describes the individual who receives treatment?
 1. Actively involved in the treatment
 2. A total believer in what is being taught
 3. Submissive to the practitioner
 4. Less competent in his or her own care
7. Which of the following describes the most effective use of St. John's wort?
 1. Antioxidant
 2. Anti-inflammatory
 3. Mild antidepressant
 4. Vasodilator
8. Meditation may augment the effects of which of the following medications?
 1. Antihypertensive medications
 2. Insulin and vitamins
 3. Prednisone
 4. Cough syrups and aspirin
9. Biofeedback techniques are frequently used in addition to relaxation interventions to assist individuals to do which of the following?
 1. Eat less food
 2. Learn to control specific autonomic nervous system responses
 3. Control diabetes
 4. Live longer with human immunodeficiency virus (HIV)
10. Therapeutic touch is a training-specific therapy that was developed by which profession?
 1. Medicine
 2. Nursing
 3. Physiotherapy
 4. Occupational Therapy

✦ RECOMMENDED WEB SITES

Canadian College of Naturopathic Medicine: <http://www.ccnm.edu>

The Web site provides detailed information about the four-year, full-time program offered by this professional college of naturopathic medicine. The site includes a resource centre with links to other Web sites.

Canadian Interdisciplinary Network for Complementary and Alternative Research (IN-CAM): <http://www.incamresearch.ca/index.php?home&lng=en>

This network facilitates research, knowledge, and education about CAM in Canada. Links to other associated networks and institutions are provided.

Chinese Medicine and Acupuncture Association of Canada: <http://www.cmaac.ca/>

This organization aims to raise the profile and reputation of Chinese medicine and acupuncture. The site includes the organization's history and a Canada-wide members' index.

College of Nurses of Ontario: Practice Guideline: Complementary Therapies: http://www.cno.org/Global/docs/prac/41021_CompTherapies.pdf

Information on complementary therapies and their application to nursing practice in Ontario can be found at this site, including guidelines for practice.

ConsumerLab: <http://www.consumerlab.com/>

The quality and quantity of ingredients in various brands of NHPs are independently tested by this organization. General use is free, but a small yearly fee is required to access the entire database.

M. D. Anderson Cancer Center: <http://www.mdanderson.org/education-and-research/departments-programs-and-labs/programs-centers-institutes/integrative-medicine-program/index.html>

The information provided here about complementary medicine and how it can be integrated with allopathic medicine is useful to both health care providers and the public.

National Center for Complementary and Alternative Medicine: <http://nccam.nih.gov/>

The center provides information on various NHPs, research, and ongoing clinical trials related to CAM. It also gives links to a variety of other resources and institutions related to complementary and alternative medicines.

Natural Health Products Directorate: <http://www.hc-sc.gc.ca/dhp-mps/prodnatur/index-eng.php>

This directorate is Health Canada's regulating authority for NHPs for sale in Canada. The site includes information on the regulatory practices, definitions related to NHPs, and an index of various health-related issues.

Public Health Agency of Canada: <http://www.phac-aspc.gc.ca/index-eng.php>

The agency's focus is on efforts to prevent chronic diseases, injuries, and public health emergencies. The agency works closely with provinces and territories to keep Canadians healthy and reduce pressures on the health care system.

Review Question Answers

1. 3; 2. 4; 3. 1; 4. 1; 5. 1; 6. 1; 7. 3; 8. 1; 9. 2; 10. 2

Rationales for the Review Questions appear at the end of the book.

Activity and Exercise

Written by Donna J. Gill, RN(EC), BScN, MSc, CRN(C)

Based on the original chapter by Rita Wunderlich, RN, PhD

objectives

Mastery of content in this chapter will enable you to:

- Define the key terms listed.
- Describe the role of the musculoskeletal and nervous systems in the regulation of movement.
- Discuss physiological and pathological influences on body alignment and joint mobility.
- Describe how to use proper body mechanics and ergonomics to prevent musculoskeletal injuries.
- Describe how exercise and activity benefit physiological and psychological functioning.
- Describe the benefits of implementing an exercise program for the purpose of health promotion.
- Describe the benefits of implementing exercise and activity during the acute, restorative, and continuing care of patients.
- Describe important factors to consider when planning an exercise program for patients across the lifespan and for those with specific chronic illnesses.
- Assess patients for impaired mobility and activity intolerance.
- Formulate nursing diagnoses for patients who experience impaired mobility and activity intolerance.
- Write a nursing care plan for a patient with impaired mobility and activity intolerance.
- Describe the interventions for maintaining activity tolerance and mobility during the acute, restorative, and continuing care of patients.
- Evaluate the nursing care plan for maintaining activity and exercise for patients across the lifespan and with specific chronic illnesses.

media resources

evolve WEBSITE

<http://evolve.elsevier.com/Canada/Potter/fundamentals/>

- Animations
- Audio Chapter Summaries
- Examination Review Questions
- Glossary
- Student Learning Activities
- Weblinks

key terms

- | | |
|---|--------------------------------|
| Activities of daily living (ADLs), p. 773 | Isometric contraction, p. 772 |
| Activity tolerance, p. 774 | Isotonic contraction, p. 772 |
| Antagonistic muscles, p. 772 | Joint, p. 770 |
| Antigravity muscles, p. 772 | Ligaments, p. 771 |
| Body mechanics, p. 769 | Long bones, p. 770 |
| Cartilage, p. 771 | Mobility, p. 778 |
| Cartilaginous joints, p. 771 | Muscle tone, p. 773 |
| Centre of gravity, p. 773 | Pathological fractures, p. 770 |
| Concentric tension, p. 772 | Posture, p. 773 |
| Eccentric tension, p. 772 | Proprioception, p. 773 |
| Ergonomics, p. 769 | Range of motion (ROM), p. 770 |
| Exercise, p. 770 | Short bones, p. 770 |
| Fibrous joints, p. 771 | Synarthrotic joint, p. 770 |
| Flat bones, p. 770 | Synchondrodial joint, p. 771 |
| Friction, p. 773 | Syndesmodial joint, p. 771 |
| Gait, p. 779 | Synergistic muscles, p. 772 |
| Hemiparesis, p. 778 | Synovial joints, p. 771 |
| Immobility, p. 784 | Tendons, p. 771 |
| Irregular bones, p. 770 | |

When providing nursing care, you will walk, turn, lift, and transfer. You use muscles and leverage when carrying out these activities. To reduce the risk of injury to the patient or yourself, you must understand and practise proper **body mechanics**, as well as use safe lifting and moving techniques. To prevent injury to yourself when performing other nursing tasks, such as pushing medication carts or stretchers, using the telephone, and documenting patient care, attention to **ergonomics** is equally important. Understanding both body mechanics and ergonomics includes knowledge of the actions of various muscle groups, knowledge of the

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► BOX 35-1 The Gift of Exercise

The other day I was looking for a gift to give to a friend. This friend is very important to me and I want her to be around for a long time. I want her to live a long and healthy life. I thought how great it would be if I could give her a gift that would improve the quality of her life.

So I sat down and made a list of what I would look for in this special gift:

It would help her to be stronger, firmer, leaner, more flexible, and energetic.

It would help lower her risk of dying from heart disease, help lower blood pressure and improve lipid profile, control her blood glucose level, fight obesity, and help her to age more gracefully.

It would help improve immune function, concentration and task performance, and the quality of sleep.

It would help reduce stress, improve mood, enhance self-esteem, and increase optimism and confidence.

It would help to increase self-awareness and control over the choices in her life.

It would be fun but also challenging.

It would allow for socialization but also time alone, depending on her needs.

It would come in all different modes and styles and adapt to various environments and weather conditions.

Finally, it would have a solid *Consumer Reports* rating, supported by scientific data from reputable sources.

After completing my list, I realized that the only gift that meets all the above criteria is the gift of exercise. Have a happy and healthy life, my friend.

Source: Huddleston, J. S. (2006). Exercise. In C. L. Edelman & C. L. Mandle (Eds.), *Health promotion throughout the lifespan* (6th ed.). St Louis, MO: Mosby.

factors involved in the coordination of body movement, and familiarity with the integrated functioning of the skeletal, muscular, and nervous systems. This chapter focuses on body mechanics and you, the nurse, whereas Chapter 45 discusses body mechanics in relation to the patient.

Nurses must promote activity and **exercise** because of the beneficial impact on wellness, prevention of illness, and restoration of optimal functioning. A program of regular physical activity and exercise has the potential to enhance all dimensions of wellness (Box 35-1). This chapter provides information about exercise and activity as it relates to health promotion of patients. The discussion of activity and exercise is equally important to you, the nurse. Nursing strategies are included to help plan an individualized exercise and activity program for a variety of patients, including those with specific chronic diseases. Nursing strategies for a patient who is acutely ill or has significant mobility issues are discussed in Chapter 45.

Scientific Knowledge Base

Activity and exercise are important to the well-being of all individuals. You will be able to provide safe and effective assistance to patients by knowing the physiology of body movement and principles of body mechanics.

Physiology of Movement

Coordinated body movement involves the integrated functioning of the skeletal, muscular, and nervous systems. Because these three systems cooperate so closely in the mechanical

support of the body, they are often considered as a single functional unit.

Skeletal System. The skeletal system or bones perform five functions in the body: support, protection, movement, mineral storage, and hematopoiesis (blood cell formation). In a discussion of body mechanics, two of these functions—support and movement—are most important (Thibodeau & Patton, 2007).

The skeleton provides attachment sites for muscles and ligaments, and the leverage necessary for movement. It is the body's supporting framework and consists of four types of bones: long, short, flat, and irregular. **Long bones** contribute to height (e.g., the femur, fibula, and tibia in the leg) and length (e.g., the phalanges of the fingers and toes). **Short bones** occur in clusters and, when combined with ligaments and cartilage, permit movement of the extremities. Two examples of short bones are the tarsal bones in the foot and the patella in the knee. **Flat bones** provide structural contour, such as bones in the skull and the ribs in the thorax. **Irregular bones** make up the vertebral column and some bones of the skull, such as the mandible.

Bones are further characterized by firmness, rigidity, and elasticity. Firmness results from inorganic salts, such as calcium and phosphate, that are laid down in the bone matrix. Firmness is related to the bone's rigidity, which is necessary to keep long bones straight and enables bones to bear weight. In addition, bones have a degree of elasticity and flexibility that changes with age. For example, newborns have a large amount of cartilage and are highly flexible, but their bones are unable to support weight. Toddlers' bones are more pliable than those of older people and thus are better able to withstand falls. Older adults, especially women, are more susceptible to bone loss (resorption) and osteoporosis. Osteoporosis Canada (2011) estimates that one in four women over age 50 and one in eight men over age 50 has osteoporosis.

The skeletal system has several other functions. Bones protect vital organs (e.g., the skull around the brain; the ribs around the heart and lungs). They also aid in calcium regulation, store calcium, and release calcium into the body's circulation as needed. Patients with decreased calcium regulation and metabolism are at risk for developing osteoporosis and **pathological fractures** (fractures caused by weakened bone tissue) (Walker, 2008). Eighty percent of fractures in Canadians over 60 are related to osteoporosis (Osteoporosis Canada, 2011). In addition, the internal structure of bones contains bone marrow, which participates in red blood cell (RBC) production (hematopoiesis) and acts as a reservoir for blood. Patients with altered bone marrow function or diminished RBC production are usually weakened and fatigue easily, which decreases their mobility and places them at risk of falling.

Joints, ligaments, tendons, and cartilage permit strength and flexibility of the skeleton. Strength enables the skeletal system to support the body.

Joints. Joints or articulations are the connections between bones. Each joint is classified according to its structure and degree of mobility. Joints are classified as four types: synarthrotic, cartilaginous, fibrous, and synovial (Huether & McCance, 2008). A person's flexibility is demonstrated through **range of motion (ROM)**, which is the range of normal movement for a joint.

In a **synarthrotic joint**, bones are jointed by bones. No movement is associated with this type of joint, and the bony tissue that forms between the bones provides strength and

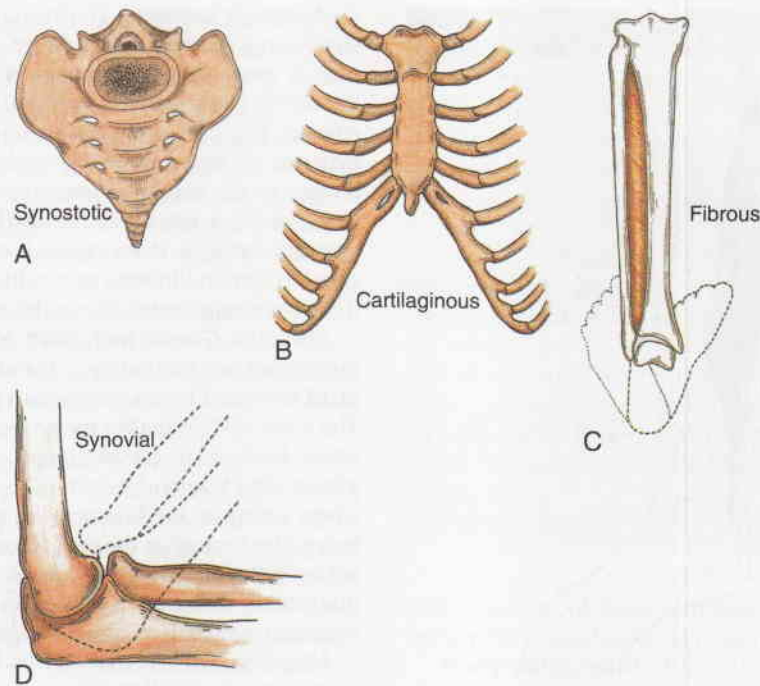


Figure 35-1 Joint types. A, Synarthrotic. B, Cartilaginous. C, Fibrous. D, Synovial.

stability. The classic example of this type of joint is the sacrum, in which vertebrae are joined (Figure 35-1, A).

The **cartilaginous joint**, or **synchondrodial joint**, has little movement but is elastic and uses cartilage to unite body surfaces. Cartilaginous joints are found when bones are exposed to constant pressure, such as the costosternal joints between the sternum and ribs (Figure 35-1, B).

The **fibrous joint**, or **syndesmodial joint**, is a joint in which two bony surfaces are united by a ligament or membrane. The fibres of ligaments are flexible and stretch, permitting a limited amount of movement. For example, the paired bones of the lower leg (tibia and fibula) are fibrous joints (Heuther & McCance, 2008) (Figure 35-1, C).

The **synovial joint**, or true joint, is a freely movable joint in which contiguous bony surfaces are covered by articular cartilage and connected by ligaments lined with a synovial membrane. Joining of the humeral radius and ulna by cartilage and ligaments forms a pivotal joint (Figure 35-1, D). Other types of synovial joints are the ball-and-socket joints (e.g., hip joint) and the hinge joints (e.g., interphalangeal joints of the fingers).

Ligaments. Ligaments are white, shiny, flexible bands of fibrous tissue that bind joints together and connect bones and cartilages. Ligaments are elastic and aid joint flexibility and support (Figure 35-2). In addition, some ligaments have a protective function. For example, ligaments between the vertebral bodies and the ligamentum flavum prevent damage to the spinal cord during movement of the back.

Tendons. Tendons are white, glistening, fibrous bands of tissue that connect muscle to bone. Tendons are strong, flexible, and inelastic, and they occur in various lengths and thicknesses. The Achilles tendon (tendo calcaneus) is the thickest and strongest tendon in the body. It begins near the middle of the posterior of the leg and attaches the gastrocnemius and soleus muscles in the calf to the calcaneal bone in the back of the foot (Figure 35-3).

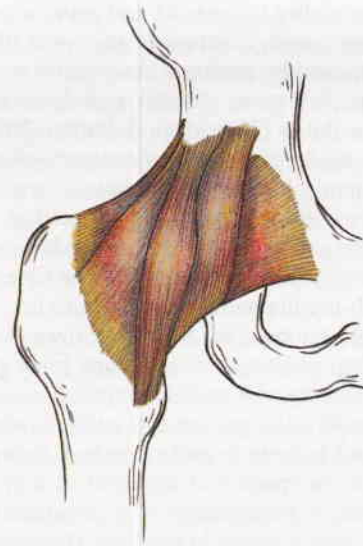


Figure 35-2 Ligaments of the hip joint.

Cartilage. Cartilage is nonvascular, supporting connective tissue with flexibility similar to that of firm plastic. The gristle-like nature of cartilage permits it to sustain weight and to serve as a shock absorber between articulating bones. It is located chiefly in the joints and thorax, trachea, larynx, nose, and ear. The fetus has a large amount of temporary cartilage, which is replaced by bone developed during infancy. Permanent cartilage is unossified (not hardened), except in advanced age and in diseases such as osteoarthritis.

Skeletal Muscle. Skeletal muscles allow for movement and determine the form and contour of the body. There are more than 600 skeletal muscles in the body. Movement of bones and joints involves active processes that must be

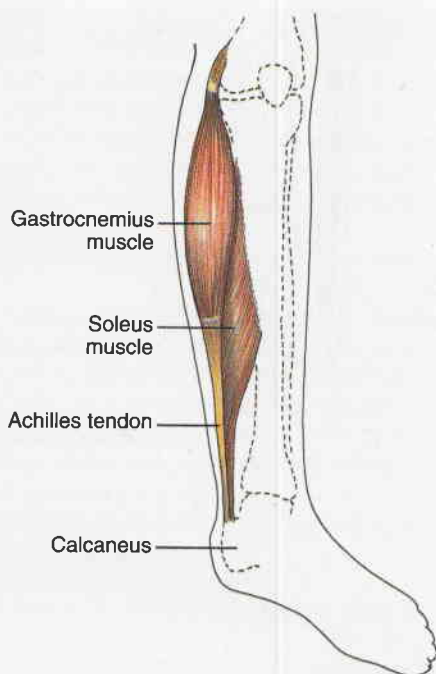


Figure 35-3 Tendons and muscles of the lower leg.

carefully integrated to achieve coordination. Skeletal muscles, because of their ability to contract and relax, are the working elements of movement. Contractile elements of the skeletal muscle are enhanced by anatomical structure and attachment to the skeleton. Adequate skeletal muscle is necessary for strength and flexibility (Thibodeau & Patton, 2007).

Muscles are made of fibres that contract when stimulated by an electrochemical impulse that travels from the nerve to the muscle across the neuromuscular junction. The electrochemical impulse causes the filaments (predominantly protein molecules of myosin and actin) within the fibre to slide past each other, with the filaments changing length.

Muscle contractions can be categorized by functional purpose: moving, resisting, or stabilizing body parts. In **concentric tension**, increased muscle contraction causes muscle shortening, resulting in movement, such as when a patient uses an overhead trapeze to pull up in bed. **Eccentric tension** helps to control the speed and direction of movement as the muscle lengthens. In the example of the overhead trapeze, the patient should slowly lower to the bed. This lowering is controlled when the muscles lengthen. Concentric and eccentric muscle actions are necessary for active movement and are therefore referred to as dynamic or **isotonic contraction**. In contrast, static or **isometric contraction** causes an increase in muscle tension or muscle work but no shortening or active movement of the muscle (e.g., instructing the patient in tightening and relaxing a muscle group, as in quadriceps set exercises or pelvic floor muscle exercises). Voluntary movement is a combination of isotonic and isometric contractions. For example, when you lift a patient up in bed, the patient's weight causes increased tension in the muscles of your arms until the tension (isometric) is equal to the weight to be lifted and the weight of your lower arms. When this equilibrium is reached, continued stimulation of the muscles results in muscle shortening (isotonic) and bending of the elbows (active movement), and the patient is lifted off the bed.

Although isometric contractions do not result in muscle shortening, energy expenditure is increased. This type of muscle work is comparable to having a car in neutral while the driver continually depresses the accelerator and races the engine. The car is not going anywhere but the driver still expends a large amount of energy. You, as the nurse, must recognize the energy expenditure (increased respiratory rate and increased work on the heart) associated with isometric exercises because these types of exercises may be contraindicated in certain illnesses or conditions (e.g., myocardial infarction or chronic obstructive pulmonary disease).

Muscles Concerned With Movement. The muscles of movement are located near the skeletal region, where movement is caused by a lever system (Thibodeau & Patton, 2007). The lever system makes the work of moving a weight or load easier. In the human body, it occurs when specific bones act as a lever. The human forearm is an application of the lever: the elbow acting as the fulcrum, the weight held in the hand and being lifted acting as the resistance, and the pull of the muscles between the elbow and the hand acting as the effort. Muscles that attach to bones involved in lever systems provide the necessary strength to move the object.

Muscles Concerned With Posture. Gravity pulls on parts of the body all the time; the only way that the body can be held in position is for muscles to exert pull on bones in the opposite direction. Muscles accomplish this counterforce by maintaining a low level of sustained contraction. Because poor posture represents a stance that is less than optimal for counteracting the force of gravity, it places more work on muscles. This leads to fatigue and can eventually interfere with bodily functions and cause deformities.

Muscle Groups. The antagonistic, synergistic, and anti-gravity muscle groups are coordinated by the nervous system and maintain posture and initiate movement. **Antagonistic muscles** bring about movement at the joint. During movement, the active mover muscle contracts, and its antagonist relaxes. For example, during flexion of the arm, the active mover (the biceps brachii) contracts and its antagonist (the triceps brachii) relaxes. During extension of the arm, the active mover, now the triceps brachii, contracts and the new antagonist, the biceps brachii, relaxes.

Synergistic muscles contract to accomplish the same movement. When the arm is flexed, the strength of the contraction of the biceps brachii is increased by contraction of the synergistic muscle, the brachialis. Thus, with synergistic muscle activity, two active movers—the biceps brachii and the brachialis—contract, and the antagonistic muscle, the triceps brachii, relaxes.

Antigravity muscles are involved with joint stabilization. These muscles continuously oppose the effect of gravity on the body and permit a person to maintain an upright or sitting posture. In an adult, the antigravity muscles are the extensors of the leg—the gluteus maximus, the quadriceps femoris, and the soleus muscles—and the muscles of the back.

Skeletal muscles support posture and carry out voluntary movement. These muscles are attached to the skeleton by tendons, which provide strength and permit motion. The movement of the extremities is voluntary and requires coordination from the nervous system.

Nervous System. Movement and posture are regulated by the nervous system. The major voluntary motor area, located in the cerebral cortex, is the precentral gyrus, or motor strip. A majority of motor fibres descend from the motor strip and cross

at the level of the medulla. Thus, the motor fibres from the right motor strip initiate voluntary movement for the left side of the body, and the motor fibres from the left motor strip initiate voluntary movement for the right side of the body.

Transmission of the impulse from the nervous system to the musculoskeletal system is an electrochemical event and requires a neurotransmitter. Neurotransmitters are chemicals (e.g., acetylcholine) that transfer the electrical impulse from the nerve across the myoneural junction to stimulate the muscle, causing movement.

Movement can be impaired by disorders that alter neurotransmitter production, as in Parkinson's disease; alter transfer from the neurotransmitter to the muscle, as in myasthenia gravis; or alter activation of muscle activity, as in multiple sclerosis (Huether & McCance, 2008).

Proprioception. Proprioception is the awareness of the position of the body and its parts (Huether & McCance, 2008). Position is monitored by proprioceptors located on nerve endings in muscles, tendons, and joints. **Posture** is regulated by the nervous system and requires coordination of proprioception and balance. As a person carries out **activities of daily living (ADLs)**, proprioceptors monitor muscle activity and body position. For example, the proprioceptors on the soles of the feet contribute to correct posture during standing or walking. During standing, pressure is continuous on the bottom of the feet. The proprioceptors monitor the pressure, communicating this information through the nervous system to the antigravity muscles. The standing person remains upright until deciding to change position. As a person walks, the proprioceptors on the bottom of the feet monitor pressure changes. Thus, when the bottom of the moving foot comes in contact with the walking surface, the individual automatically moves the stationary foot forward. The proprioceptors allow people to walk without having to watch their feet.

Balance. A person must have adequate balance when standing, running, lifting, or performing ADLs. Balance is controlled by the nervous system, specifically by the cerebellum and the inner ear. A major function of the cerebellum is to coordinate all voluntary movement, particularly highly skilled movements, such as those required in skiing.

Within the inner ear are the semicircular canals, three fluid-filled structures that assist in maintaining balance. Fluid within the canals has a certain inertia, and when the head is suddenly rotated in one direction, the fluid remains stationary for a moment, whereas the canal turns with the head. This allows a person to change position suddenly without losing balance.

Principles of Body Mechanics

Good body mechanics is the use of correct muscles to complete activities safely and efficiently, without unnecessary strain on any muscle or joint. It involves the coordinated efforts of the musculoskeletal and nervous systems to maintain body alignment, balance, and posture during activity and exercise. This applies to the patient and the nurse. Nursing activities may include lifting, bending, moving, and performing ADLs. Using the principles of proper body mechanics during routine activities reduces the risk of injury to the nurse and the patient (Box 35-2).

Keep in mind that nurses spend a good deal of time performing other tasks, ones not directly associated with their patients. Other activities often include standing or sitting at desks and computers to document care, collaborating with other members of the health team, and preparing equipment

BOX 35-2 Principles of Body Mechanics

- The wider the base of support, the greater the stability.
- The lower the centre of gravity, the greater the stability.
- The equilibrium of an object is maintained as long as the line of gravity passes through its base of support.
- Facing the direction of movement prevents abnormal twisting of the spine.
- Dividing balanced activity between arms and legs reduces the risk of back injury.
- Leverage, rolling, turning, or pivoting requires less work than lifting.
- When friction is reduced between the object to be moved and the surface over which it is moved, less force is required to move it.
- Reducing the force of work reduces the risk of injury.
- Maintaining good body mechanics reduces fatigue of the muscle groups.
- Alternating periods of rest and activity helps to reduce fatigue.

and supplies. All these activities require as much attention to proper body mechanics as does hands-on patient care.

Body Alignment. Body alignment refers to the relationship of one body part to another body part along a horizontal or vertical line. Correct alignment reduces the strain on musculoskeletal structures, maintains adequate **muscle tone**, and contributes to balance.

Body Balance. Body balance is achieved when a relatively low **centre of gravity** is balanced over a wide, stable base of support and a line falls from the centre of gravity vertically through the base of support. The base of support is the foundation. When the line from the centre of gravity does not fall vertically through the base of support (that is, when the line is on an angle other than 90 degrees), the body loses balance. Body balance is also enhanced by proper posture, or the body position that most favours function, requires the least muscular work to maintain, and places the least strain on muscles, ligaments, and bones (Thibodeau & Patton, 2007).

Use balance to maintain proper body alignment and posture by taking two simple actions. First, widen the base of support by separating your feet to a comfortable distance. Second, bring the centre of gravity closer to the base of support; do this by bending your knees and flexing your hips until you are squatting yet maintaining proper back alignment by keeping your trunk erect.

Friction. Friction is a physical force—the resistance encountered during the act of rubbing one object against another (Myers, 2009). Because it opposes movement, you are more likely to experience a musculoskeletal injury as a result of friction (and the patient may suffer a friction abrasion) if you are not careful. To minimize the chance of such injuries, reduce friction by following some basic principles:

- Avoid lifting or moving patients manually. Using a mechanical lift completely prevents friction.
- In situations when you must assist a patient to move manually, use a friction-reducing device such as a slider sheet, slide board, or transfer board to reduce friction.
- When possible, use some of the patient's strength and mobility to assist with transferring or moving the patient in bed. For instance, if patients can bend their knees as you assist them in moving up in bed, friction is decreased. Explain the procedure and tell the patient when to move (see Chapter 45).

- The greater the surface area of the object to be moved, the greater the friction. If a patient is unable to assist in moving up in bed, placing the patient's arms across the chest decreases surface area and reduces friction.

Pathological Influences on Body Mechanics and Movement

Many pathological conditions affect body alignment and movement and hence the capacity for exercise and activity. These conditions include congenital abnormalities, degenerative diseases, and episodic illnesses affecting bones, joints, muscles, and the central nervous system. Chronic diseases affecting the internal organs can also affect an individual's capacity for activity and exercise.

Congenital Abnormalities. Congenital abnormalities affect musculoskeletal alignment, balance, and appearance. For example, osteogenesis imperfecta is an inherited disorder characterized by bones that are porous, short, bowed, and deformed; as a result, children with this disorder experience curvature of the spine and shortness of stature (Hockenberry-Eaton & Wilson, 2008). Scoliosis is a structural curvature of the spine associated with vertebral rotation. Muscles, ligaments, and other soft tissues become shortened as a result. Balance and mobility are affected in proportion to the severity of abnormal spinal curvatures (Hockenberry-Eaton & Wilson, 2008).

Degenerative Diseases. Degenerative diseases are those that affect an individual's health and abilities over time, generally in a progressively deteriorating way. Degenerative diseases of the nervous system such as Parkinson's disease or multiple sclerosis can affect an individual's control of movement and balance. Diseases of the skeletal system such as osteoporosis and osteomalacia weaken the bones and make them more prone to fractures. An autoimmune system disorder such as rheumatoid arthritis is characterized by inflammation and destruction of the synovial membrane and articular cartilage resulting in pain in the joints (Huether & McCance, 2008).

Other Chronic Diseases. Many chronic diseases of the internal organs also affect an individual's ability to be active and exercise. Diseases of the heart such as coronary artery disease and heart failure can alter tissue perfusion and hence activity tolerance. Chronic diseases of the lungs such as asthma and chronic obstructive pulmonary disease can impair gas exchange, thus also affecting activity tolerance. Diabetes, chronic renal impairment, and various cancers can all similarly affect one's ability to exercise.

Episodic Illnesses. Episodic illnesses affecting movement and exercise include anything that brings about an abrupt change in the bones, joints, muscles, or central nervous system. These can include musculoskeletal trauma such as sprains or fractures and neuromuscular conditions such as spinal cord injuries, brain injuries, or cerebrovascular accidents (CVA or stroke). These often result in a period of reduced mobility followed by a period of rehabilitation and thus are described in more detail in Chapter 45.

Exercise and Activity

Exercise is physical activity for the purpose of conditioning the body, improving health, and maintaining fitness, or it may be used as a therapeutic measure. When a person exercises, physiological changes occur in body systems (Box 35-3). The exercise program chosen and developed for a patient depends on that individual's **activity tolerance**, or the kind and amount of

BOX 35-3 Effects of Exercise

Cardiovascular System

Increased cardiac output
Improved myocardial contraction, thereby strengthening cardiac muscle
Decreased resting heart rate
Improved venous return

Pulmonary System

Increased respiratory rate and depth followed by a quicker return to resting state
Improved alveolar ventilation
Decreased work of breathing
Improved diaphragmatic excursion

Metabolic System

Increased basal metabolic rate
Increased use of glucose and fatty acids
Increased triglyceride breakdown
Increased gastric motility
Increased production of body heat

Musculoskeletal System

Improved muscle tone
Increased joint mobility
Improved muscle tolerance to physical exercise
Possible increase in muscle mass
Reduced bone loss

Activity Tolerance

Improved tolerance
Decreased fatigue

Psychosocial Factors

Improved tolerance to stress
Reports of "feeling better"
Reports of decrease in illness (e.g., colds, influenza)

Sources: Based on Huether, S. E., & McCance, K. L. (2008). *Understanding pathophysiology* (2nd ed.). St. Louis, MO: Mosby; and Hoeman, S. P. (2008). *Rehabilitation nursing: Process, application, and outcomes* (4th ed.). St Louis, MO: Mosby.

exercise or activity that the individual is able to perform. Physiological, emotional, and developmental factors influence the patient's activity tolerance.

A program of regular physical activity and exercise promotes physical and psychological health. An active lifestyle is important for promoting and maintaining health and is also an essential treatment modality for chronic illnesses. Regular physical activity and exercise enhance functioning of all body systems, including cardiopulmonary functioning (endurance), musculoskeletal fitness (strength, flexibility, and bone integrity), weight control and maintenance, and psychological well-being (body image) (Huddleston, 2006; Warburton et al., 2010).

The best program of physical activity includes a combination of exercises that produce different physiological and psychological benefits. Isotonic, isometric, and resistive isometric are three categories of exercise classified according to the type of muscle contraction involved. Isotonic exercises cause muscle contraction and changes in muscle length (isotonic contraction). Walking, swimming, dance aerobics, jogging, bicycling, and moving arms and legs with light resistance are examples

of isotonic exercises. The benefits of isotonic exercises include increased circulatory and respiratory functioning, increased osteoblastic activity (activity by bone-forming cells) to combat osteoporosis, and increased muscle tone, mass, and strength.

Isometric exercises involve tightening a muscle and holding it for a number of seconds in a stationary position while maintaining the tension (isometric contraction). This form of exercise is ideal for patients who are unable to tolerate the increase in activity expected during isotonic exercises. Isometric exercises are especially helpful to people who are recovering from injuries that limit range of motion. For example, *quad setting*—pressing the knee toward the bed and holding—is used after knee surgery. Benefits of isometric exercises include minimized potential for muscle wasting by increasing muscle mass, tone, and strength; increased circulation to the involved body part; and increased osteoblastic activity.

Isometric exercises also may be resistive. Resistive isometric exercises are those in which the individual contracts the muscle while pushing against a stationary object or resisting the movement of an object (Hoeman, 2008). A gradual increase in the amount of resistance and in the length of time that the muscle contraction is held will increase muscle strength and endurance. The *plank* (for abdominal strengthening) and the *wall push-up* (for chest, tricep, and shoulder strengthening) are resistive isometric exercises with which you may be familiar. The patient who is in a sitting position may do *hip lifting*, in which the hands push against a surface such as the seat of a chair to raise the hips. After hip surgery, *gluteal setting* is prescribed: in a supine position, keeping the legs straight, together, and in contact with the bed, with a loop or belt positioned around the thighs just above the knees, press legs outward against the belt and hold. Resistive isometric exercises help to promote muscle strength and provide sufficient stress against bone to promote osteoblastic activity.

Nursing Knowledge Base

This section is concerned with knowledge from areas of nursing practice that enable you to meet the holistic needs of the patient. Developmental changes, behavioural aspects, environmental issues, cultural and ethnic influences, and family and social support are important aspects of a person and must be incorporated into the plan of care, whether the patient is seeking health promotion, acute care, or restorative and continuing care.

Developmental Changes

Throughout the lifespan, the body's appearance and functioning undergo change. The greatest change and impact on the maturational process are observed at both ends of the developmental spectrum.

Infants Through School-Aged Children. The newborn infant's spine is flexed and lacks the anteroposterior curves of the adult. The first spinal curve occurs when the infant extends the neck from the prone position. As growth and stability increase, the thoracic spine straightens and the lumbar spinal curve appears, which allows sitting and standing.

The toddler's posture is awkward because of the slight swayback and protruding abdomen. As the child walks, the legs and feet are usually far apart and the feet are slightly everted. Toward the end of toddlerhood, posture appears less awkward, curves in the cervical and lumbar vertebrae are accentuated, and foot eversion disappears.

By the third year, the body is slimmer, taller, and better balanced. Abdominal protrusion is decreased, the feet are not as far apart, and the arms and legs have increased in length. The child appears more coordinated. The musculoskeletal system continues to grow and develop through adolescence (see Chapter 22).

Adolescence. The period of adolescence is usually initiated by a tremendous growth spurt. Growth is frequently uneven. As a result, the adolescent may appear awkward and uncoordinated. Adolescent girls usually grow and develop earlier than boys do. In girls, hips widen and fat is deposited in the upper arms, thighs, and buttocks. The adolescent boy's changes in shape are usually a result of long-bone growth and increased muscle mass (see Chapter 22).

Young to Middle-Aged Adults. An adult who has correct posture and body alignment feels good, looks good, and generally appears self-confident. The healthy adult also has the necessary musculoskeletal development and coordination to carry out ADLs. Normal changes in posture and body alignment in adulthood occur mainly in pregnant women. These changes result from the body's adaptive response to weight gain and the growing fetus (see Chapter 23). When pregnant, the woman's centre of gravity shifts toward the anterior. As a result, the pregnant woman leans back and is slightly swaybacked. She may complain of back pain.

Older Adults. A progressive loss of bone mass occurs in the older adult. Some of the possible causes of this loss are physical inactivity, hormonal changes, and increased osteoclastic activity (activity by cells responsible for bone tissue absorption). The effect of bone loss is weaker bones, causing vertebrae to be softer and long shaft bones to be less resistant to bending.

In addition, older adults may walk more slowly and appear less coordinated. They also may take smaller steps, keeping their feet closer together, which decreases their base of support. Thus, body balance may become unstable, and they are at greater risk for falls and injuries (see Chapter 24).

Changes in muscle tissue also occur as adults age, beginning as early as during the twenties for men and during the forties for women. Muscle fibres shrink and have reduced tone and contractility. Strength and endurance change; fatigue occurs more readily, and overall energy may be reduced (Paterson & Warburton, 2010).

safety alert Falls and the resulting injuries are among the most debilitating medical problems that prevent the older adult from remaining independent. Regular exercise that promotes strengthening, flexibility, and balance can help prevent falls in the older adult (Fahlman et al., 2007; Huddleston, 2006; Registered Nurses' Association of Ontario [RNAO], 2005).

Behavioural Aspects

Patients are more likely to incorporate an exercise program into their daily lives if it is supported and assisted by family and friends, nurses, physicians, and other members of the health care team. As the nurse, you should take into consideration the patient's knowledge of exercise and activity, barriers to a program of exercise and physical activity, and current exercise habits.

Patients are more open to developing an exercise program if they are at the stage of being ready to change their behaviour. Prochaska and DiClemente's Transtheoretical Model of

► BOX 35-4

General Strategies for Initiating and Maintaining an Exercise Program

An exercise program is most likely to be initiated and maintained when the individual

- Perceives a net benefit
- Chooses an enjoyable activity
- Feels competent doing the activity
- Feels safe doing the activity
- Can easily access the activity on a regular basis
- Can fit the activity into the daily schedule
- Feels that the activity does not generate financial or social costs that he or she is unwilling to bear
- Experiences a minimum of negative consequences such as injury, loss of time, negative peer pressure, and problems with self-identity
- Is able to successfully address issues of competing time demands
- Recognizes the need to balance the use of labour-saving devices and sedentary activities with activities that involve a higher level of physical exertion

Source: Adapted from Mayo Clinic: Healthy Lifestyle. (2011). *Fitness basics*. Retrieved from <http://www.mayoclinic.com/health/fitness/MY00396>.

Behaviour Change has been the most utilized model of understanding and facilitating behaviour change since it was developed in the 1980s. It identifies five stages individuals go through in implementing a lifestyle change: precontemplation, contemplation, preparation, action, and maintenance (Hutchinson et al., 2008). Information on the benefits of regular exercise may be helpful to the patient in the contemplation stage. Patients' decisions to change behaviour and include a daily exercise routine in their lives may occur gradually with the provision of repeated information that is individualized to their needs and lifestyle (Box 35-4). Once the patient has reached the action stage, you must develop, in collaboration with the patient, an exercise program that is customized to fit his or her needs. You then must provide continued follow-up support and assistance until the exercise program becomes a daily routine.

Environmental Issues

Work Sites. A common barrier for many patients is the lack of time needed to engage in a daily exercise program. Work sites have the potential to help their employees overcome the obstacle of time constraints by offering opportunities, reminders, and rewards for those committed to physical fitness (Health Canada, 2004; Box 35-5). Signs could be used to encourage employees to use the stairs instead of elevators. Rewards such as free parking or discounted parking fees could be given to employees who walk from distant lots (Canadian Fitness and Lifestyle Research Institute, 2006; Health Canada, 2004).

Schools. After many years of decreasing emphasis on physical education, it is increasingly clear that children are becoming less active, resulting in an increase in childhood obesity, high blood pressure, high cholesterol, and higher rates of depression (Flynn et al., 2006; Janssen & LeBlanc, 2010). Recently, daily physical activity or physical education has been mandated in elementary schools across Canada, but secondary schools are not keeping up (Active Healthy Kids Canada, 2007). Only 18% of Canadian teenagers accumulate

* BOX 35-5

FOCUS ON PRIMARY HEALTH CARE**A Work Site Diabetes Prevention Program**

Diabetes has so many potential complications, with associated economic and social costs, that all individuals, whether they are recognized as being at higher risk or not, should exercise as an essential primary prevention strategy.

In a recent study, prediabetic and previously undiagnosed diabetic employees participated in a 12-month diabetes prevention program at their work site. Registered nurses and a diabetic educator presented the three components of the program in both group and individual settings. Employees were encouraged to raise their level of physical activity, with membership in the employee fitness centre offered as an incentive. Dietary education focused especially on lowering fat intake. Behaviour change activities incorporated social support networks and consisted of identifying barriers to change in activity level and diet.

Aerobic fitness and a number of physiological measures improved significantly after 6 months and were maintained over the 12 months of the program. Significant improvement in glucose tolerance tests (GTT) and aerobic fitness continued for a full 24 months. More than half of the employees who participated in the study had normal GTT at two years.

The research by Aldana et al. (2006) demonstrates that implementation of education and exercise programs by occupational health nurses can have a strong influence on the well-being of employees. By reducing blood glucose below prediabetic and diabetic levels, workplace diabetes prevention programs can help prevent the onset of diabetes.

Source: Aldana, S., Barlow, M., Smith, R., Yanowitz, F., Adams, T., Loveday, L., & Merrill, R.M. (2006). A worksite diabetes prevention program: Two year impact on employee health. *American Association of Occupational Health Nurses Journal*, 54(9), 389-396.



enough daily activity to meet international guidelines for optimal growth and development (Canadian Fitness and Lifestyle Research Institute, 2006). Schools can provide a foundation for lifetime commitment to exercise and physical fitness by incorporating physical activity into a child's daily routine.

Community. The community's support of physical fitness can be instrumental in promoting the health of its members. Examples of community involvement to promote physical fitness are the provision of walking trails and track facilities in community parks and physical fitness classes offered by trained professionals. Cost constraints may make availability of such amenities challenging. However, success in implementing physical fitness programs depends on a collaborative effort between public health agencies, parks and recreational associations, provincial and local government agencies, health care agencies, and community members.

Cultural and Ethnic Influences

Exercise and physical fitness is beneficial to all human beings. When developing a physical fitness program for culturally diverse populations, you must consider what is motivating and what is deemed appropriate and enjoyable. For example, South Asians living in Canada have reported that their physical exercise has been limited because of weather, lack of motivation, embarrassment over clothing or appearance, and not

feeling comfortable participating in activities outside the home (South Asian Dietary Resource Working Group, 2007). Aerobic exercise in the form of dancing to songs from Bollywood movies is one culturally appropriate and community-based activity recommended for this population by the Working Group. Canadians from a traditional Chinese background value fitness activities based on Chinese culture—that is, activities that are gentle, soft, slow, relaxed, safe, and outdoor oriented (Lu et al., 2008). The Aboriginal population is another example of a group within Canada that has unique risk factors and traditions that must be taken into consideration when planning interventions for activity and exercise (Box 35-6).

Family and Social Support

Social support can be used as a motivational tool to encourage and promote exercise and physical fitness. The patient can engage a friend or a significant other to participate in a “buddy system” whereby they walk together each day at a specified time. This companionship provides for socialization and increases the enjoyment for some patients. It may lead to the development of a lifelong commitment to physical fitness.

* BOX 35-6 CULTURAL ASPECTS OF CARE

Epidemiological studies of ethnic groups indicate that physical inactivity is one of the risk factors associated with noninsulin-dependent diabetes mellitus (NIDDM). In Canada, NIDDM is between 3.6 and 5.3 times more prevalent within the Aboriginal population. Physical activity has been identified as playing an important role in the prevention and treatment of NIDDM, yet the Aboriginal population has a disproportionate number of poor, unemployed, and disadvantaged individuals who lack access to recreation and leisure activities.



Implications for Practice

- Because physical inactivity is a modifiable risk factor for the development of NIDDM, prevention and treatment programs need to focus heavily on exercise and to be tailored to the activity tolerance of the individual patient.
- Motivational factors incorporated into the exercise program, such as providing a healthy snack or meal for participants and furnishing each patient with a log to monitor weight loss and blood glucose levels, will enhance compliance.
- Promotion of physical activity should be supported by recognizing that a symbiotic relationship exists between cultural values and traditional leisure pursuits. Patients with a strong spiritual connection to the land may enjoy outdoor or wilderness recreation in the form of traditional games and activities, such as lacrosse and hunting.
- Ensure that members of Aboriginal groups collaborate in the planning and educational program initiatives.
- Development of an exercise or prevention program, or both, should attempt to remove potential barriers, such as transportation and cost, to facilitate commitment to the program.

Sources: Adapted from Huddleston, J. S. (2006). Exercise. In C. L. Edelman & C. L. Mandle (Eds.), *Health promotion throughout the lifespan* (6th ed.). St Louis, MO: Mosby; Young, T. K., & Katzmarzyk, P. T. (2007). Physical activity of Aboriginal people in Canada. *Applied Physiology, Nutrition and Metabolism*, 32(Suppl 2E), S148–S160; and Government of Alberta. (2007). *Cultural diversity: Including everyone in physical activity*. Retrieved from <http://www.healthyalberta.com/HealthyPlaces/642.htm>.

Parents can support their children in sports and physical activity by providing encouragement, praise, and transportation and by participating themselves (Rhodes & Pfaeffli, 2010).

Critical Thinking

Successful critical thinking requires a synthesis of knowledge, experience, information gathered from patients, critical thinking attitudes, and intellectual and professional standards. Patients' conditions are always changing. Clinical judgements require you to anticipate the information necessary, analyze the data, and make decisions regarding patient care.

To understand activity tolerance and physical fitness and their impact on the patient, you must integrate knowledge from nursing and other disciplines, previous experiences, and information gathered from patients. As you begin the process of problem solving for patient care, a variety of concepts must be considered together to provide the best outcome for the patient. The foundation for planning and decision making is knowledge of the musculoskeletal system and of health alterations that create problems for the patient in the area of activity, exercise, and body mechanics. In addition, you must stay current on and incorporate various guidelines, such as those supplied by the Canadian Diabetes Association (2008) and in the *Canadian Physical Activity Guidelines* developed by the Canadian Society of Exercise Physiology (2011). Your experiences and your ability to think creatively and critically enhance your approach to each new patient situation.

Many acquired, congenital, degenerative, and chronic conditions affect the structure of the musculoskeletal system and the function of the nervous system or impair activity tolerance to some degree. The impairment can be temporary or permanent. For patients with limited exercise capacity or activity tolerance, develop the nursing care plan to include interventions that maintain the present level of function with the goal of increasing the level of function.

Your experiences and your critical thinking attitude affect the problem-solving approach that is used with each new patient. Remember that patients have the capacity for improvement in spite of the impairments. Encouragement, support, commitment, creativity, and perseverance are important attitudes in critical thinking for these patients.

Nursing Process

❖ Assessment

Assessment of body alignment and posture is completed with the patient standing, sitting, or lying down. Use assessment to determine normal physiological changes in growth and development; deviations related to poor posture, trauma, muscle damage, or nerve dysfunction; and any learning needs of patients. In addition, during assessment you can observe their posture and obtain important information about other factors that contribute to poor alignment, such as inactivity, fatigue, malnutrition, and psychological problems. To gather relevant information, ask questions related to the patient's exercise and activity tolerance. During assessment (Figure 35-4), consider all the elements that contribute to making appropriate nursing diagnoses.

Put the patient at ease so that unnatural or rigid positions are not assumed. When assessing body alignment of a patient who is immobilized or unconscious, remove pillows and

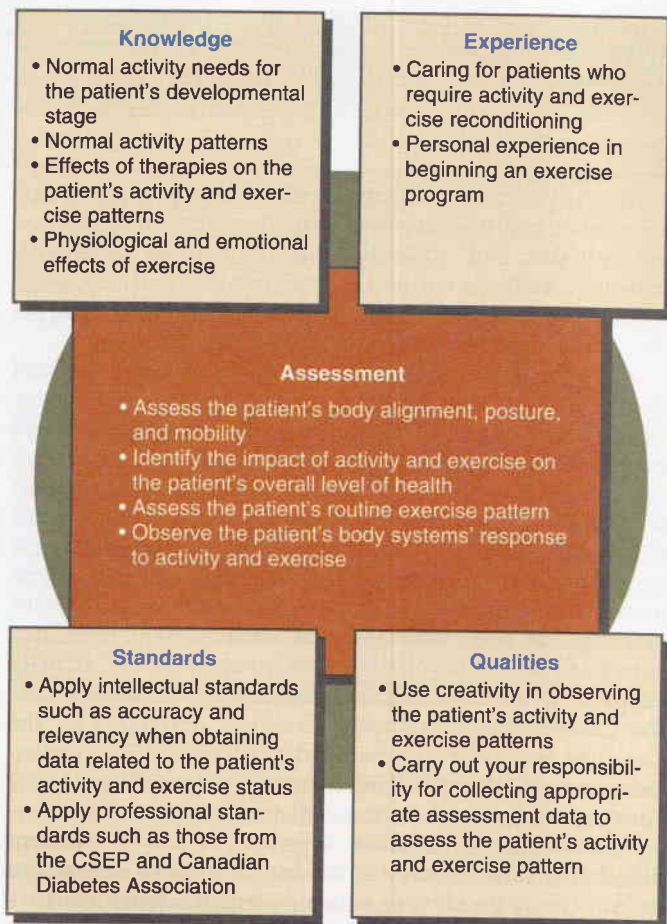


Figure 35-4 Critical thinking model for activity and exercise assessment. CSEP, Canadian Society for Exercise Physiology.

positioning supports from the bed if not contraindicated, and place the patient in the supine position.

Body Alignment

Standing. An assessment of the patient who is standing should include looking for deviations in the following normal body alignment: the head should be erect and in the body's midline; body parts should be symmetrical; the spine should be straight with normal curvatures (cervical concave, thoracic convex, lumbar concave); the abdomen should be comfortably tucked; the knees should be in a straight line between the hips and ankles and should be slightly flexed; the feet should be flat on the floor and pointed directly forward and slightly apart to maintain a wide base of support; and the arms should hang comfortably at the sides (Figure 35-5). The patient's centre of gravity is in the midline, and the line of gravity is from the middle of the forehead to a midpoint between the feet. Laterally, the line of gravity runs vertically from the middle of the skull to the posterior third of the foot (Wilson & Giddens, 2005).

Sitting. An assessment of the patient in the sitting position should include looking for deviations in the following normal body alignment: the head should be erect and the neck and vertebral column in straight alignment; the body weight should be distributed on the buttocks and thighs; the thighs should be parallel and in a horizontal plane (be careful to avoid pressure on the popliteal nerve and blood supply); the feet

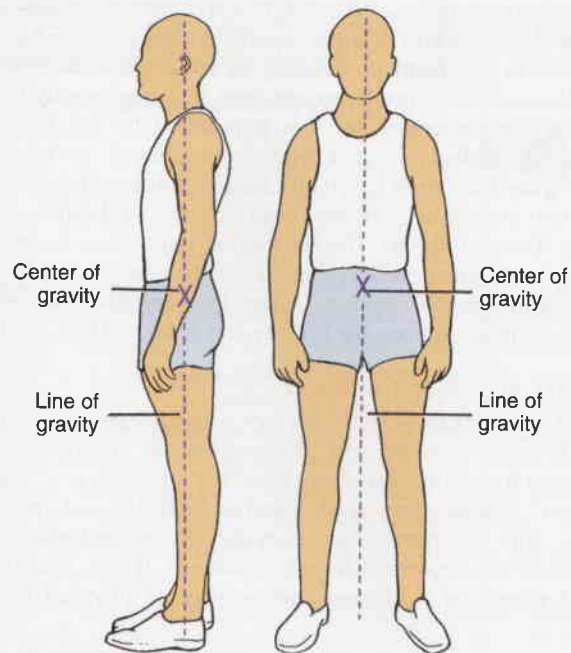


Figure 35-5 Correct body alignment when standing.

should be supported on the floor; and the forearms should be supported on the armrest, in the lap, or on a table in front of the chair.

Assessment of alignment in the sitting position is particularly important for the patient with muscle weakness, muscle paralysis, or nerve damage. A patient with these alterations has diminished sensation in affected areas and is unable to perceive pressure or decreased circulation. Proper sitting alignment reduces the risk of musculoskeletal system damage in such a patient.

Recumbent Position. An assessment of the patient in the recumbent position requires that the patient be placed in the supine position with all but one pillow and all positioning supports removed from the bed. The vertebrae should be in straight alignment without observable curves.

Conditions that create a risk of damage to the musculoskeletal system when lying down include impaired mobility (e.g., traction), decreased sensation (e.g., **hemiparesis** from a stroke), impaired circulation (e.g., diabetes), and lack of voluntary muscle control (e.g., spinal cord injuries).

When a patient is unable to change position voluntarily, assess the position of body parts while the patient is lying down. This is best done with you standing at the foot or head of the bed. The vertebrae should be in straight alignment without any observable curves. The extremities should be in alignment and not crossed over one another. The head and neck should be aligned without excessive flexion or extension.

Mobility

The assessment of mobility enables you to determine the patient's coordination and balance while the patient is walking, the ability to carry out ADLs, and the ability to participate in an exercise program. The assessment of **mobility** has four components: range of motion, gait, exercise, and activity tolerance.

Range of Motion. Assessing range of motion (ROM) is one assessment technique used to determine the degree of

damage or injury to a joint (see Chapter 31). These measurements enable you to answer questions about joint stiffness, swelling, pain, limitation of movement, and unequal movement. Limited ROM may indicate inflammation such as arthritis, fluid in the joint, altered nerve supply, or contractures. Increased mobility (beyond normal) of a joint may indicate connective tissue disorders, ligament tears, or possible joint fractures.

Gait. Gait, including rhythm, cadence, and speed, is the manner or style of walking. Walking with a limp is a gait. Propulsive, scissors, spastic, steppage, and waddling are descriptive names for other common gaits. Assessing gait allows you to draw conclusions about balance, posture, and the ability to walk without assistance. Note conformity; a regular, smooth rhythm; symmetry in the length of leg swing; smooth swaying related to the gait phase; and a smooth, symmetrical arm swing (Wilson & Giddens, 2005).

Exercise. Exercise is physical activity aimed at conditioning the body, improving health, maintaining fitness, or providing therapy to correct a deformity or restore the overall body to a maximal state of health. Determine how much exercise and the types of exercise that the patient participates in regularly. Ask the patient to describe the types of activities he or she does in a typical day or week. For greater accuracy, have the patient keep a diary of exercise activities for a week and review it together.

Activity Tolerance. Activity tolerance is the kind and amount of exercise or activity a person is able to perform. You need to assess activity tolerance when planning physical activity for health promotion and for patients with acute or chronic illness. This assessment provides the nurse with baseline data about the patient's activity patterns and assists in determining which factors (physical, psychological, or motivational) are affecting activity tolerance. Box 35-7 lists factors that affect activity tolerance.

Patient Expectations

In assessing the patient's expectations concerning activity and exercise, you will first need insight into the patient's perception of what is normal or acceptable with regard to physical fitness (Box 35-8). For example, one of the factors that affect physical activity is freedom from pain. If exercising is painful or fatiguing to the patient, compliance with and commitment to the desired interventions may be lacking. Patients may be content with their present physical activity and fitness and may not perceive a need for improvement. Unless a real threat to health maintenance exists, forcing the patient to accept your perspective is a breach of standards of care.

❖ Nursing Diagnosis

Assessment of the patient's activity tolerance, physical fitness, body alignment, and joint mobility provides related clusters of data or defining characteristics that help you identify a nursing diagnosis. You must be accurate when identifying diagnoses. For example, a patient who reports being tired or weakened potentially could be diagnosed as having activity intolerance or fatigue. Use defining characteristics to lead to the definitive diagnosis. For example, a finding of abnormal heart rate or dyspnea would lead you to the diagnosis of activity intolerance, not to fatigue.

When activity and exercise are problems for a patient, nursing diagnoses often focus on the individual's ability to

► BOX 35-7

Factors That Affect Physical Activity Tolerance

Physiological Factors

Skeletal abnormalities
Muscular impairments
Endocrine or metabolic illnesses (e.g., diabetes mellitus or thyroid disease)
Hypoxemia
Decreased cardiac function
Decreased endurance
Impaired physical stability
Pain
Sleep pattern disturbance
Prior exercise patterns
Infectious processes and fever

Emotional Factors

Anxiety
Depression
Chemical addictions
Motivation

Developmental Factors

Age
Gender

Pregnancy

Physical growth and development of muscle and skeletal support

Source: Adapted from Monohan, F. D., Sands, J. K., Neighbors, M., Marek, J. F., & Green-Nigro, C. J. (2007). *Phipps' medical-surgical nursing: Health and illness perspectives* (8th ed.). St Louis, MO: Mosby.

move. The diagnostic label should direct nursing interventions. This requires the correct selection of the related factors. For example, activity intolerance related to excess weight gain requires very different interventions than if the related factor is prolonged bed rest. Box 35-9 provides an example of how the diagnostic process leads to accurate diagnosis selection. The following are examples of nursing diagnoses related to activity and exercise:

- *Health-seeking behaviours*
- *Readiness for enhanced self-care*
- *Activity intolerance*
- *Ineffective coping*
- *Impaired gas exchange*
- *Risk for injury*
- *Impaired physical mobility*
- *Imbalanced nutrition: more than body requirements*
- *Acute or chronic pain*

❖ Planning

During planning, synthesize information from multiple resources (Figure 35-6). Your critical thinking ensures that the patient's care plan integrates all patient information. Best practice guidelines are especially important to consider when you develop a care plan as these documents establish scientifically based guidelines for selecting effective nursing interventions.

Concept maps assist in the planning of care. Figure 35-7 shows the relationship between a patient's medical diagnosis of heart failure and the identified nursing diagnosis.

► BOX 35-8 Nursing Assessment Questions

Nature of the Problem

- What types of problems are you having with physical activities and exercise?
- Why do you think your exercise and physical activity levels are inadequate?
- Describe your typical daily exercise routine and level of physical activity.
- What types of exercise do you prefer?
- How long do you exercise at any given time?

Signs and Symptoms

- Do you experience muscular or joint pain during or after exercise?
- Do you experience shortness of breath during physical activity?
- Do you experience chest discomfort or pain during exercise or physical activity?

Onset and Duration

- Which physical activities cause you to become short of breath?
- How long does it take to resume normal breathing after exercise or physical activity?

Severity

- How far do you walk before the pain in your legs begins?
- On a scale of 0 to 10 (with 10 being the worst discomfort), rate your leg pain.
- Describe your shortness of breath as minimal, moderate, or severe after physical activities or exercise, or both.

Barriers to Exercise and Activity

- Do you have any chronic illnesses that affect your ability to carry out activities of daily living (ADLs) or exercise?
- Do you have any physical limitations that prevent you from exercising on a daily basis?
- Do you have access to a community walking path or exercise equipment, or both?
- What prevents you from exercising 30 minutes each day?

Effect on Patient

- Has the lack of an exercise routine affected your weight?
- Have you felt more fatigued since you have not been able to exercise on a routine basis?
- Have you noticed any increase in shortness of breath when performing activities that require little exertion?

Goals and Outcomes. Once you identify the nursing diagnoses, you and the patient can set goals and expected outcomes to direct interventions. The plan should include consideration of preexisting health concerns and of any risks of injury to the patient. It is especially important to have knowledge of the patient's home environment when planning therapies to maintain or improve activity, body alignment, and mobility. For some patients with alterations in joint mobility, family members may be the providers of care. Include the patient's family in the care plan. The general goal related to exercise and activity is to improve or maintain the patient's motor function and independence. The following are examples of outcomes for patients with deficits in activity and exercise (Ackley & Ladwig, 2008):

- Participates in prescribed physical activity while maintaining appropriate heart rate, blood pressure, and breathing rate.

► BOX 35-9 NURSING DIAGNOSTIC PROCESS

Impaired Physical Mobility

Assessment Activities

Observe patient's gait.

Observe patient performing tasks such as feeding, dressing, or recreational activities.

Measure range of joint motion.

Defining Characteristics

Shuffled gait
Uncoordinated gait
Patient reports slower walking speed

Uncoordinated movements
Limited fine motor coordination

Reduced joint motion in lower and/or upper extremities
Stiffness in joints

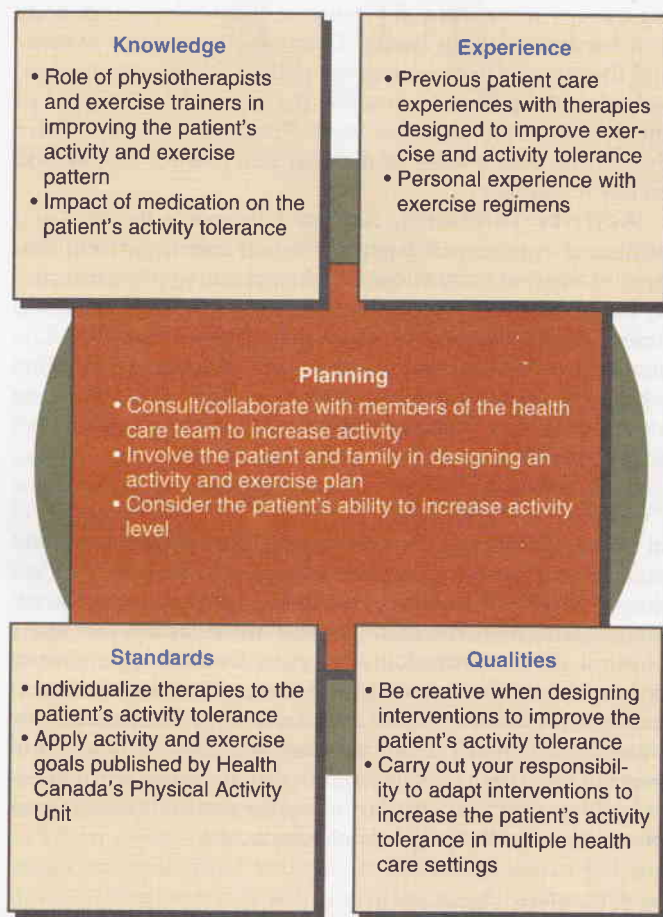


Figure 35-6 Critical thinking model for activity and exercise planning.

- Shows an understanding of the need to increase activity gradually according to tolerance and symptoms
- Expresses understanding of the need to balance rest and activity

Setting Priorities. Care planning is individualized to the patient, taking into consideration the patient's most immediate needs. The immediacy of any problem is determined by the effect that the problem has on the patient's mental and

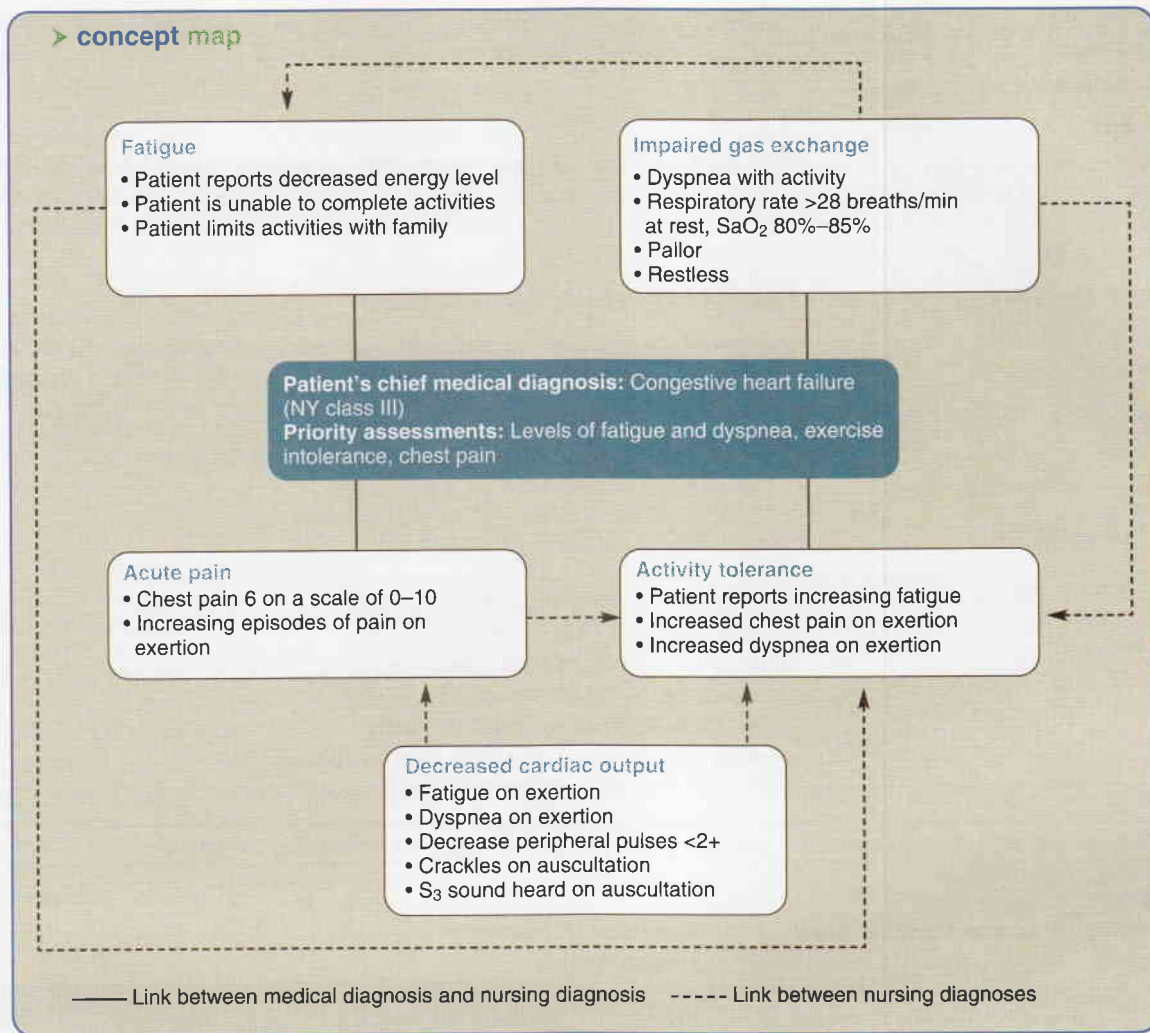


Figure 35-7 Concept map for a patient with heart failure and decreased activity.

physical health. For example, a patient may have chronic diseases such as diabetes and hypertension, which would be improved with an increase in exercise. However, if that same patient has recently experienced angina, immediate investigation and treatment of the angina is the priority.

Collaborative Care. Patients with complex medical problems or multiple co-morbidities may require the collaboration of multiple health care providers. Physicians, physiotherapists, kinesiologists, and occupational therapists may all be important for these patients. Formal rehabilitation programs may be necessary. In addition, always individualize a care plan to meet the actual and potential needs of the patient (see Box 35-10).

❖ Implementation

Health Promotion

A sedentary lifestyle contributes to the development of health-related problems. Promote health by encouraging patients to engage in a regular exercise program (Box 35-11). Discuss the recommendations for physical activity and fitness with the patient (Box 35-12). Design a program of exercise in collaboration with the patient, taking into account developmental (Box 35-13) and cultural factors (Box 35-14). For example, older

adults may be able to prevent functional decline and improve independence through routine completion of ADLs (Warburton et al., 2006).

Before starting an exercise program, patients should calculate their maximum heart rate by subtracting their current age in years from 220 and then determine their target heart rate by calculating 60% to 90% of this maximum rate. Patients should be taught to monitor their pulse during exercise and to exercise so that the heart rate is maintained within the target range.

Regardless of the exercise prescription implemented by the patient, warm-up and cool-down periods must be included in the program (Gillespie, 2006). The warm-up period usually lasts 5 to 10 minutes and may include stretching, calisthenics, and subsequent aerobic activity performed at a lower intensity. The warm-up period prepares the body and decreases the potential for injury. The cool-down period follows the exercise routine and usually lasts 5 to 10 minutes. The cool-down period allows the body to readjust to baseline functioning gradually and provides an opportunity to combine movement such as stretching with relaxation-enhancing mind-body awareness (Gillespie, 2006).

Many patients find it difficult to incorporate an exercise program into their daily routines because of time constraints.

► BOX 35-10 NURSING CARE PLAN

Activity Intolerance

Assessment

Mrs. Mary Wertenberger is a 45-year-old homemaker. She has enrolled in a cardiovascular disease prevention (CDP) program prescribed by her physician and conducted by Eric Sieple, a registered nurse. Mrs. Wertenberger has several risk factors associated with cardiovascular disease. She expresses feelings of stress resulting from excessive demands on her time. Eric's assessment included a discussion of Mrs. Wertenberger's current health problems as well as a pertinent physical examination.

Assessment Activities

Ask Mary what prompted her physician to recommend a CDP program.

Ask Mary about her exercise and eating habits.

Perform baseline assessment.

Findings and Defining Characteristics*

She responds, "I *gained 23 kg* over the past year. I become *fatigued* easily and lack the energy to keep up with even simple household chores. I don't want to leave the house anymore."

She responds, "I want to exercise but with the demands of child care and caring for my aging parents, I just don't feel like it. I feel pulled in every direction, that increases my stress, and then I want to eat, eat, eat!"

Height: 160 cm
Weight: 102 kg
Blood pressure: 152/90 mm Hg (at rest)
Pulse: 96 beats per minute (at rest)
Breathing rate: 20 breaths per minute (at rest)
Blood pressure: 164/96 mm Hg (climbing 10 steps)
Pulse: 120 beats per minute (climbing 10 steps)
Breathing rate: 36 breaths per minute (climbing 10 steps)

*Defining characteristics are shown in italics.

Nursing Diagnosis: Activity intolerance related to excessive weight gain, inactivity, and lack of cardiovascular fitness

Planning

Goals (Nursing Outcomes Classification)*

Patient will develop a plan of exercise that incorporates isotonic and isometric exercises.

Patient's activity tolerance will improve.

Patient's cardiopulmonary response to exercise will improve.

Expected Outcomes Health Beliefs

Patient will state the physiological and psychological effects of exercise. Patient will commit to performing physical exercise at home.

Activity Tolerance

Patient will perform and record exercise patterns three to four times over the next two weeks.

Patient's level of fatigue associated with exercise will remain the same or decrease.

Cardiovascular Pump Effectiveness

Patient's resting diastolic blood pressure will be below 80 mm Hg.

Patient's systolic blood pressure will be below 140 mm Hg. Patient's resting heart rate will range between 75 and 85 beats per minute.

*Outcome classification labels from Moorhead, S., Johnson, M., Maas, M. L., & Swanson, E. (Eds.). (2008). *Nursing outcomes classification (NOC)* (4th ed.). St Louis, MO: Mosby.

Interventions (Nursing Interventions Classification)*

Exercise Promotion

Instruct the patient about the physiological benefits of a regular exercise program.

Instruct the patient about the psychological benefits of a regular exercise program.

Develop a progressive plan of exercise with the patient, such as 3 to 5 km of brisk walking and quadriceps, biceps, and gluteal muscle isometric exercises three to four times per week.

Rationale

Physical activity and exercise protect against the development of cardiovascular disease (CVD) and decrease other risk factors associated with CVD, such as obesity, hypertension, and hyperlipidemia (Hamilton et al., 2007; Lloyd & Barnett, 2008; Sigal et al., 2006).

Physical activity and exercise increase self-esteem, feelings of enjoyment, self-confidence, and mood and decrease physical and psychological stress, anxiety, and depression (Paterson & Warburton, 2010).

Cross-training (a combination of exercise activities) provides variety to combat boredom and increases potential for total body conditioning (Huddleston, 2006).

► BOX 35-10 NURSING CARE PLAN—cont'd

Exercise Promotion

Instruct patient to use an exercise log and to record the day, time, duration, and responses (pulse, feelings, shortness of breath, daily weight).

Keeping a log may increase adherence to exercise prescription.

Schedule weekly meetings with the patient for follow-up and review of exercise log, progress, and barriers.

Patients are more likely to increase physical activity and remain compliant with an exercise program if they are counselled by a health care provider (Gillespie, 2006).

*Intervention classification labels from Bulechek, G. M., Butcher, H. K., & Dochterman, J. M. (Eds.). (2008). *Nursing interventions classification (NIC)* (5th ed.). St Louis, MO: Mosby.

Evaluation

Nursing Actions

Patient Responses and Findings

Achievement of Outcomes

Review patient's exercise log at each visit.

She responds, "I make time to exercise because of this log. I hate missing a day and leaving a blank page; this represents failure. I want to succeed." Exercise log documents activity four times per week.

Patient reports enjoying exercise, as well as observing some personal benefits of exercise.

The exercise log is facilitating adherence to the exercise prescription.

Record weight, blood pressure, and pulse.

Weight, 95 kg. Resting heart rate between 80 and 85 beats per minute. Blood pressure, 146/86 mm Hg.

Improved cardiovascular effects of exercise:

- Heart rate is within normal range.
- Blood pressure is lower but not at expected range. Monitor blood pressure as patient continues to lose weight.

Ask patient if exercise is helping to lower fatigue level.

She responds, "At first, finding time to exercise was hard, but once I started feeling less tired and even less stressed, it was easy to integrate exercise into my daily activities."

Achieved improved activity tolerance with exercise.

► BOX 35-11 Promoting Exercise

Nurses can do the following to help patients participate in exercise:

- Educate patients about the importance of exercise in preserving health.
- Encourage patients to pace activities and increase speed and intensity gradually to avoid pain.
- Administer prescribed anti-inflammatory medications one to two hours before starting an exercise program.
- Encourage patients to balance rest and activity and to get plenty of sleep.
- Teach patients to use canes or walkers to assist with walking as needed.
- Encourage patients to choose smooth and even walking surfaces.
- Advise patients not to force joints past the point of resistance or pain.
- Teach patients to check legs and feet daily for redness, swelling, blisters, or broken skin.
- Teach patients to wear properly fitting shoes with nonslip soles.
- Encourage patients to walk with a companion or group so that exercise is socially rewarding.

For these patients, it is beneficial to reinforce that exercise can be incorporated in small amounts—as little as 10 minutes at a time. Activities such as taking a short walk at lunch or walking to the corner store instead of driving can help increase total exercise. A more active lifestyle can be promoted by taking the stairs instead of the elevator and parking farther from the entrance.

Other patients may benefit from a prescribed exercise and physical fitness program carefully designed to meet their needs and expectations. A comprehensive exercise prescription incorporates a combination of aerobic exercise, stretching and flexibility exercises, and resistance training. Aerobic exercise includes such activities as walking, running, bicycling, aerobic dance, jumping rope, and cross-country skiing. Recommended frequency of aerobic exercise is three to five times per week, or every other day. For a patient who prefers to exercise every day, recommend cross-training. For example, the patient may run one day and do yoga on the next day.

Stretching and flexibility exercises include active ROM exercises that allow for stretching of all muscle groups and joints. This form of exercise is ideal for warm-up and cool-down periods. Benefits include increased flexibility, improved circulation and posture, and an opportunity for relaxation.

Resistance training increases muscle strength and endurance and is associated with improved performance of daily activities and avoidance of injuries and disability. Formal resistance training includes weight training, but the same benefits can be obtained by performing ADLs such as pushing a vacuum cleaner, raking leaves, shovelling snow, and kneading bread. Some patients may use weight training to bulk up their muscles. However, the purpose of weight training from a health perspective is to develop tone and strength and to stimulate and maintain healthy bones (Katula et al., 2006).

Acute Care

Patients in acute care often have reduced activity tolerance or are immobile to varying degrees. Promoting activity and

► BOX 35-12 Recommendations for Exercise

Children 5-11 and Youths 12-17

Preamble

- Should be physically active as part of play, games, sports, transportation, recreation, physical education, or planned exercise in the context of family, school and community
- Activity can improve cholesterol levels, blood pressure, body composition, bone density, cardiorespiratory, musculoskeletal fitness, and aspects of mental health
- May be appropriate for children with a disability or medical condition

Guidelines

- At least 60 minutes of moderate- to vigorous-intensity physical activity daily
- Vigorous-intensity activities at least three days per week
- Activities that strengthen muscle and bone at least three days per week
- More daily physical activity provides greater health benefits

Adults 18-64

Preamble

- Can meet guidelines through planned exercise sessions, transportation, recreation, sports or occupational demands, in the context of family, work, volunteer and community activities
- Reduce the risk of premature death, coronary heart disease, stroke, hypertension, colon cancer, breast cancer, type 2 diabetes, osteoporosis, and improve fitness, body composition, and indicators of mental health
- Guidelines may be available for those who are pregnant, have a disability or medical condition

Guidelines

- At least 150 minutes of moderate- to vigorous-intensity aerobic physical activity per week, in bouts of 10 minutes or more
- Add muscle- and bone-strengthening activities using major muscle groups, at least two days per week

Adults 65 and Older

Preamble

- Should be achieved above and beyond the incidental physical activities accumulated in the course of daily living
- Following guidelines may reduce the risk of chronic disease and premature death, maintain functional independence and mobility, improve fitness, body composition, bone health, cognitive function, and indicators of mental health
- May be appropriate for older adults with frailty, a disability, or medical condition

Guidelines

- Accumulate at least 150 minutes of moderate- to vigorous-intensity aerobic physical activity per week in bouts of 10 minutes or more
- Add muscle- and bone-strengthening activities using major muscle groups at least two days per week
- Those with poor mobility should perform physical activities to enhance balance and prevent falls

Source: Adapted from Canadian Society of Exercise Physiology. (2011). *Canadian physical activity guide*. Retrieved from <http://www.csep.ca/english/view.asp?x=804>.

* BOX 35-13 FOCUS ON OLDER ADULTS

You should base an older patient's exercise program on individual assessment data (underlying conditions, medications, present activity level). Before starting an exercise program, consult the physician for exercise restrictions. Modification of the exercise program is based on the individual's responses. Instruct the patient as follows:



- It is never too late to begin an exercise program (Huddleston, 2006). However, remind patients to consult a health care provider before beginning an exercise program, particularly if a patient has heart or lung disease or other chronic illnesses.
- Recommend tai chi, a traditional Chinese conditioning exercise that increases balance and strength. This form of exercise has resulted in reduced fear of falling and an increased sense of well-being in older adults (Adler & Roberts, 2006). It has also been shown to improve balance and reduce falls (Leung et al., 2011).
- Improve joint mobility and enhanced circulation can be achieved simply by stretching and exaggerating movements during the performance of ADLs.
- Use correct body mechanics, wear appropriate clothing and footwear, and maintain sufficient hydration.
- Perform a gradual, extended exercise warm-up (e.g., 15 minutes) to maximize flexibility and decrease muscle injury.
- Begin at a low level (40% to 50% of predicted maximal heart rate; maximal heart rate is estimated as the number 220 minus patient's age), and follow gentle exercise progression.
- Avoid sudden twisting movements, rapid movements, and rapid transitions from one movement to the next.
- Maintain proper body alignment to minimize joint and muscle stress.
- Use stronger joints or larger muscle groups to decrease joint stress and pain.
- Avoid exercises that tax vision and balance.
- Avoid sustained isometric contractions of >10 seconds.
- Avoid exercise during acute viral infections.
- Stop exercising if cardiac dysrhythmias, angina, or excessive breathlessness occurs.
- Perform cool-down exercises until the heart rate returns to resting level to decrease postural hypotension and cardiac dysrhythmias.

Source: Adapted from Touhy, T., Jett, K., Boscart, V., and McCleary, L. (2012). *Ebersole & Hess' gerontological nursing and healthy aging* (1st Canadian ed.). Toronto: Elsevier Canada.

preventing the effects of **immobility** are paramount and described in Chapter 45. This chapter focuses on the way the nurse carries out the physical demands of nursing in such a way that the wellness of the nurse is promoted.

When working with patients who are immobile and physically dependent for mobility, nurses and other health care providers assist patients with turning and moving in bed, transferring between surfaces and walking. It is essential for nurses to utilize good body mechanics to reduce the risk of injury to themselves, their co-workers and their patients. In Ontario, over 50% of nurses who lost work time experienced musculoskeletal disorders—that is, injuries to the neck, shoulder, and back (Workers Health and Safety Centre, 2011). Whether you are assisting a patient from the bed to the chair, lifting a patient's limb, or teaching a patient to carry out ADLs

* BOX 35-14 CULTURAL ASPECTS OF CARE

Cultural influences play an important role in defining exercise and physical activity. Often, exercise is described relative to white, middle-class values. Immigrants may be more sedentary and less likely to join a fitness or golf club because they lack the financial means and social support or would not feel comfortable (Im & Choe, 2004). Certain cultures discourage involvement in organized recreational physical activities such as basketball and aerobics. In some cultures, ethnic dancing is a more acceptable activity than organized sports (Jain & Brown, 2001). Other cultures emphasize exercise through activities of daily living, such as walking, gardening, and prayer or meditation. As an example, people from Bangladesh view prayer as a structured form of exercise. Muslims value participation in community activities and may consider walking to the mosque part of their weekly exercise regime.



Implications for Practice

- Nurses must evaluate patterns of daily living and culturally prescribed activities before suggesting specific forms of exercise to patients.
- Nurses must help patients plan physical activities that are culturally acceptable.
- Exercise programs must be flexible and accommodate the patient's family, cultural, and community responsibilities.

Sources: Based on Andrews, M., & Boyle, J. (2002). *Transcultural concepts in nursing care* (4th ed.), Philadelphia, PA: Lippincott; Cromwell, S., & Berg, J. (2006). Lifelong physical activity patterns of sedentary Mexican American women. *Geriatric Nursing*, 27, 209; Im, E., & Choe, M. (2004). Korean women's attitudes toward physical activity. *Research in Nursing and Health*, 27(1), 4–18; Jain, S., & Brown, D. (2001). Cultural dance: An opportunity to encourage physical activity and health in communities. *American Journal of Health Education*, 32, 216; Lim, K., Kaiser-Jones, J., Waters, C., & Yoo, G. (2007). Aging, health and physical activity in Korean Americans. *Geriatric Nursing*, 28(2), 112; and Shin, Y., Yun, S., Jang, H., & Lim, J. (2006). A tailored program for the promotion of physical exercise among Korean adults with chronic diseases. *Applied Nursing Research*, 19(2), 88.

efficiently, applying the principles of body mechanics is crucial to prevent injury. When providing patient care, incorporate your knowledge of physiological influences on body alignment and mobility.

Using principles of safe patient transfer and positioning during routine care activities also decreases work effort. To increase and reinforce the knowledge of colleagues and patients' families, teach them how to transfer and position patients properly.

The Canadian Centre for Occupational Health and Safety (2011) has published numerous guidelines related to ergonomic standards for preventing musculoskeletal injuries in the workplace. More than half of all back pain in health care settings is associated with manual lifting tasks (Workers Health and Safety Centre, 2011). Back injuries are often the direct result of improper lifting and bending. The most common back injury is strain on the muscle group around the lumbar vertebrae. Injury to this area affects the ability to bend forward, backward, and from side to side. The ability to rotate the hips and lower back is also decreased. Relying on body mechanics alone does not provide sufficient protection from musculoskeletal injuries that can occur when lifting or transferring patients (Waters et al., 2006). Although safe lifting guidelines are in widespread use, all of them acknowledge that no particular weight is absolutely safe to lift (Workers Health and

Safety Centre, 2011). Moreover, as has been stated, "The adult human form is an awkward burden to lift or carry. Weighing up to 200 pounds or more, it has no handles, it is not rigid, and is susceptible to severe damage if mishandled or dropped. When lying in a bed, a patient is placed inconveniently for lifting, and the weight and placement of such a load would be tolerated by few industrial workers" ("The nurse's load," 1965, p. 422).

Nurses need to be aware of good lifting techniques to protect themselves, those they supervise, and the patients being cared for. Before lifting, turning, or positioning a patient, assess the weight to be moved and what assistance the patient can provide. Do not attempt to lift a patient without assistance, unless the patient is a young child or a lightweight adult who is able to help while being moved. Often a second person and/or patient-handling equipment will be needed. Use mechanical lifts, friction-reduction devices, slide boards, and other handling aids available in your workplace (Worksafe BC, 2006). Many health care agencies have a "no-lift" policy, in which manual lifting of the whole or a large part of the weight of the patient by a health care worker is prohibited, except for in exceptional or life-threatening situations. Some agencies also utilize lift teams (Table 35-1).

Once the amount of assistance is determined and any necessary equipment is in place, the following steps should be followed:

1. Keep the weight to be lifted as close to the body as possible; this action places the object in the same plane as the lifter and close to the centre of gravity for balance.
2. Bend at the knees; this helps to maintain the centre of gravity and uses the stronger leg muscles to do the lifting (Figure 35-8).
3. Tighten abdominal muscles and tuck the pelvis; this provides balance and helps protect the back.
4. Maintain the trunk erect and knees bent so that multiple groups work together in a coordinated manner.
5. Avoid twisting. Twisting can overload the spine and lead to serious injury.

Nurse injuries are related not only to lifting. Many nursing activities involve bending and twisting and may cause injury. Examples of such activities are bathing, feeding, and dressing and undressing patients.

When an injury does occur, it is essential for the nurse to get immediate treatment for the injury (Box 35-15). The nurse must also report the injury to the appropriate supervisor and complete any necessary paperwork as per the health care facility's incident reporting system.

It is the responsibility of the nurse not only to implement existing safe handling policies within the workplace but also to advocate for enhancements to safety (Box 35-16). That includes identifying unsafe situations such as broken equipment or the improper techniques of others. It involves reviewing literature and government policy to remain current on best practices. The nurse must advocate for change within the workplace when safer options exist for the benefit of all staff and patients.

Restorative and Continuing Care

Restorative and continuing care involves implementing activity and exercise strategies to assist the patient regaining mobility and activity capacity after acute care is no longer needed. This type of restorative care is discussed in Chapter 45. Restorative and continuing care also includes activities and exercises

► **TABLE 35-1** Preventing Lift Injuries in Health Care Workers

Action	Rationale
When planning to move a patient, arrange for adequate help. If your institution has a lift team, use it as a resource.	A lift team is properly trained in techniques to prevent musculoskeletal injuries.
Use patient-handling equipment and devices, such as height-adjustable beds, ceiling-mounted lifts, friction-reducing slide sheets, and air-assisted devices.	These devices help to reduce the caregiver's muscular strain during patient handling.
Encourage patient to assist as much as possible.	This promotes patient's independence and strength but minimizes workload.
Keep back, neck, pelvis, and feet aligned.	Reduces risk of injury to lumbar vertebrae and muscle groups.
Avoid twisting.	Twisting increases risk of injury.
Flex knees; keep feet wide apart.	A broad base of support increases stability.
Position yourself close to patient (or object being lifted).	Reduces horizontal reach and stress on caregiver's back.
Use arms and legs (not back).	The leg muscles are stronger, larger muscles capable of greater work without injury.
Slide patient toward yourself, using a pull sheet or slide board.	Sliding requires less effort than lifting. A pull sheet minimizes shearing forces, which can damage patient's skin.
When transferring a patient onto a stretcher or bed, a slide board is more appropriate.	
The person with the heaviest load coordinates efforts of the team involved by counting to 3.	Simultaneous lifting minimizes the load for any one lifter.
Perform manual lifting as a last resort and only if it does not involve lifting most or all of a patient's weight.	Lifting is a high-risk activity that causes significant biochemical and postural stressors.

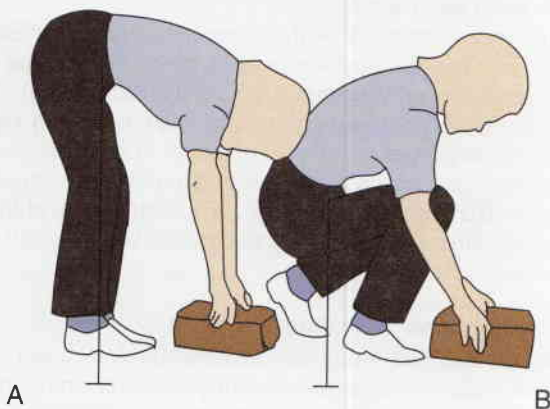


Figure 35-8 Body position for lifting. **A**, Incorrect. **B**, Correct.

► **BOX 35-15** Immediate Treatment of Soft Tissue Injuries

The most crucial period of time for treating soft tissue injuries is during the first 6 to 12 hours (Lewis et al., 2010). Basic treatment of soft tissue injuries is summarized by the acronym RICES:

- R:** Rest minimizes the potential for further damage to a joint already unstable because of injury.
- I:** Ice reduces pain threshold; it should not be applied for longer than 30 minutes at a time.
- C:** A wet elastic wrap is applied, with enough compression to hold ice in place.
- E:** Elevation of the injured part several centimetres above the heart facilitates venous return and reduces swelling.

* **BOX 35-16** EVIDENCE-INFORMED PRACTICE GUIDELINE

Promoting Safe Handling of Patients and Prevention of Injury to Nurses and Their Patients



- Know your health care facility's safety information and training concerning the transfer, positioning, and lifting of patients.
- Use recommended back safety guidelines to prevent musculoskeletal injuries.
- Use current research, standards, and guidelines regarding safe positioning and transfer of patients.
- Use "lift teams" and patient-handling equipment, such as mechanical lifts and transfer, to prevent injury to yourself and the patient.
- Advocate for the incorporation of evidence and guidelines into policies to promote a healthy work environment.

Sources: Based on Worksafe BC. (2006). *High risk manual handling of patients in healthcare*. Retrieved from http://www.worksafebc.com/publications/health_and_safety/by_topic/assets/pdf/handling_patients_bk97.pdf; and Nelson, A., Owen, B., Lloyd, J. D., Fragala, G., Matz, M. W., Amato, M., Bowers, J., Moss-Cureton, S., Ramsey, G., & Lentz, K. (2003). Safe patient handling and movement. *American Journal of Nursing*, 103(3), 32–44.

that restore and promote optimal functioning in patients with specific chronic illnesses, such as coronary heart disease (CHD), hypertension, chronic obstructive pulmonary disease (COPD), and diabetes mellitus (Box 35-17). Remaining active while living with chronic diseases improves outcomes, including prevention of complications, improved function, and enhanced quality of life. Given the degree of physical compromise individuals with one or more chronic diseases may experience, consultation with the patient's primary care provider and/or medical specialist is prudent prior to implementation of an exercise plan. There are patients whose chronic disease process may be so advanced that they are unable to participate in even the most modest of exercise programs.

Coronary Heart Disease (CHD). Activity and exercise have been shown to play a role in secondary prevention or recurrence of CHD. Cardiac rehabilitation is an integral part of the comprehensive care of patients who have been diagnosed with CHD. Nurses are involved in many aspects of cardiac rehabilitation and assist patients in developing exercise programs that fit their needs and levels of functioning. Increased

BOX 35-17 RESEARCH HIGHLIGHT

Energy Requirements of Tai Chi

Research Focus

Developing alternative exercise strategies for patients with very low functional capacities is a challenge because of the increased risk for complications and injuries. Tai chi c'hih, a modified version of tai chi, may be an approach to health promotion in older adults and in patients with chronic illnesses.



Research Abstract

The purpose of the study conducted by Li et al. (2004) was to determine the energy cost of tai chi c'hih, which is a form of exercise consisting of a series of slow, balanced movements and breathing. The objective of this study was to measure the energy costs and cardiovascular effects of tai chi c'hi to assist in the planning of a safe exercise regime for patients with very low energy reserves. Twenty-six adults participated in the completion of surveys to estimate functional capacity and exercise participation, in a select series of nine tai chi c'hih movements, and in oxygen consumption testing during the exercise program. The results of the study indicated that the energy requirements for this alternative form of exercise were comparable with low-level exercises suitable for people with low exercise tolerance.

Evidence-Informed Practice

- Before initiating exercise, patients should consult a health care provider.
- Encouraging patients with chronic illnesses to exercise has the potential to maintain and improve activity tolerance.
- Tai chi c'hih promotes feelings of relaxation and increased energy, thus making it an ideal alternative form of exercise for patients with chronic illnesses.

Reference: Li, F., Harmer, P., Fisher, K. J., & McAuley, E. (2004). Tai chi: Improving functional balance and predicting subsequent falls in older persons. *Medicine and Science in Sports and Exercise*, 36(12), 2046–2052.

physical activity appears to benefit individuals with myocardial infarction, angina pectoris, or heart failure, as well as those who have had a coronary artery bypass graft or percutaneous transluminal coronary angioplasty. Patients with CHD benefit from exercise and activity and can experience reduced mortality and morbidity, improved quality of life, increased psychological well-being, improved left ventricular function, increased functional capacity, and decreased blood lipids (Conroy et al., 2005; Villareal et al., 2006).

Hypertension. Exercise is instrumental in the reduction of systolic and diastolic blood pressure readings. Low-to moderate-intensity aerobic exercise (e.g., brisk walking, bicycling) appears to be the most effective exercise for lowering blood pressure, whereas weight training and high-intensity aerobics seem to have minimal benefits (Gillespie, 2006; Huddleston, 2006).

Chronic Obstructive Pulmonary Disease (COPD). Individuals with COPD should be encouraged to remain physically active. Some patients are fearful of participating in exercise because of the potential of worsening dyspnea (difficulty breathing). This aversion to physical activity sets up a progressive deconditioning in which minimal physical exertion results in dyspnea. Pulmonary rehabilitation is a beneficial therapeutic tool to help patients with COPD reach an optimal level of functioning. Patients can be taught specific breathing

techniques to reduce the work of breathing that can be applied in times of anxiety or stress when inefficient breathing patterns appear (O'Donnell et al., 2008).

Diabetes Mellitus. Along with diet, glucose monitoring, and medication, exercise is an important component in the care of patients with diabetes mellitus. Individuals with type 1 diabetes are encouraged to exercise because exercise leads to improved cardiovascular fitness and psychological well-being. You can instruct the patient with type 1 diabetes about certain risks and precautions regarding exercise. Instruction should include the need for a pre-exercise physical examination and precautions to monitor blood glucose immediately before and after exercise. You also can instruct patients to perform low- to moderate-intensity exercises, to carry a concentrated form of carbohydrates (e.g., sugar packets, hard candy), and to wear a medical alert bracelet. Patients with type 2 diabetes who decide to participate in a regular program of exercise should incorporate low-intensity warm-up and cool-down periods, should include aerobic exercise at 50% to 75% of maximal oxygen uptake, and should exercise for 150 minutes per week. They should also participate in resistance exercise three times per week (Canadian Diabetes Association, 2008).

❖ Evaluation

Patient Care

With regard to activity and exercise, measure the effectiveness of nursing interventions by the success in meeting the patient's expected outcomes and goals of care. The patient is the only one who will experience the effectiveness and benefits of activity and exercise (Figure 35-9). To evaluate the effectiveness of nursing interventions in enhancing activity and exercise, make comparisons with baseline measures that include pulse, blood pressure, strength, endurance, and psychological well-being. Compare actual outcomes with expected outcomes to determine the patient's health status and progression. Continuous evaluation helps to determine whether new or revised therapies are required and whether new nursing diagnoses have developed.

Patient Expectations

To evaluate the patient's perception of nursing care related to activity and exercise, you must first have assessed the patient's perspective on what is most important and the patient's expectations of the health care team. Working closely with the patient will enable you to identify goals and strategies that can be met realistically within the limits of the patient's priorities, capabilities, and health treatment (Box 35-18). Because the outcome you consider to be acceptable or anticipated may be different from that of the patient and family members, it is important to ask patients if their expectations of care have been met.

❖ KEY CONCEPTS

- Exercise is physical activity for the purpose of conditioning the body, improving health, and maintaining fitness, or it may be used as a therapeutic measure.
- Careful attention to body mechanics and use of appropriate equipment is critical in the prevention of musculoskeletal injuries.
- Activity tolerance is the kind and amount of exercise or work that a person is able to perform.
- Physiological, emotional, and developmental factors influence the patient's activity tolerance.

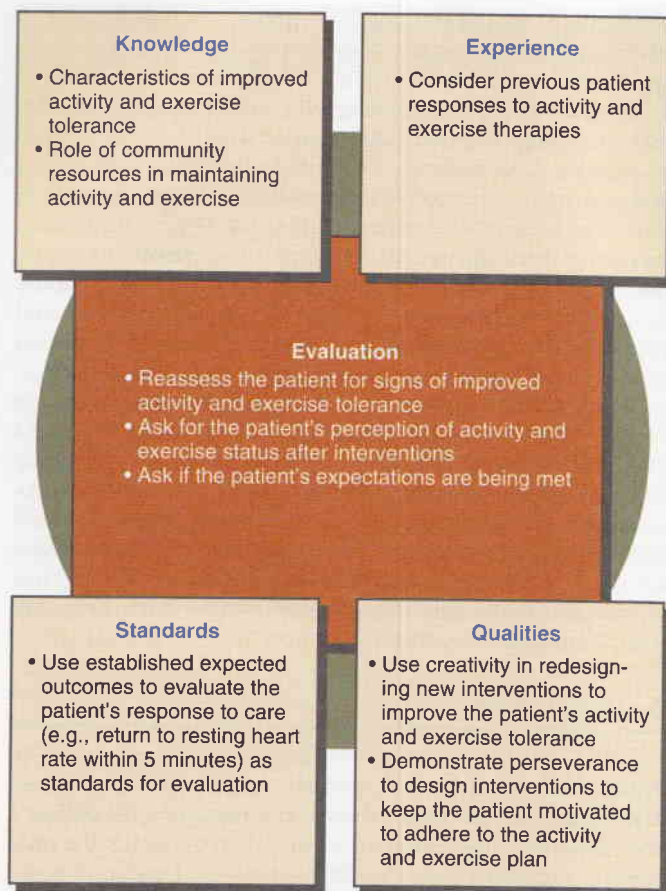


Figure 35-9 Critical thinking model for activity and exercise evaluation.

- The best program of physical activity includes a combination of exercises that produce different physiological and psychological benefits.
- Coordinated body movement to move, lift, bend, stand, sit, lie down, and complete daily activities requires integrated functioning of the skeletal system, skeletal muscles, and nervous system.
- Muscles primarily associated with movement are located near the skeletal region, where movement results from leverage, which is characteristic of the upper extremities.
- Coordination and regulation of muscle groups depend on muscle tone and activity of antagonistic, synergistic, and anti-gravity muscles.
- Balance is assisted by nervous system control in the cerebellum and by inner ear function.
- Body balance is achieved when a wide base of support exists, the centre of gravity is within the base of support, and the centre of gravity is vertically aligned with the base of support.
- Developmental changes, behavioural aspects, environmental issues, cultural and ethnic influences, and family and social support affect the patient's perception of and motivation to engage in physical activity and exercise.
- Ability to engage in normal physical activity and exercise depends on intact and functioning nervous and musculoskeletal systems.
- Use the nursing process to provide care for patients who are experiencing or are at risk for activity intolerance and impaired physical mobility.

BOX 35-18 NURSING STORY

Activity and Exercise

I have been in nursing for over 40 years. For more than 30 years of that time, before moving into teaching, I worked as a hospital staff nurse providing direct care to patients. I worked mainly in areas where patients were unable to assist themselves very much, such as in the birthing and critical care units. As is the case with most nurses, the wear and tear of lifting, turning, and transferring patients took a toll on my body, primarily on my back, knees, and feet. But for as long as it was part of my role, I was able to do work.

Several years later, after I began teaching a nursing fundamentals course, my physical activity related to nursing consisted of demonstrating fundamental skills in the laboratory setting and of providing assistance to students with their practice. During my fifth year of teaching that course, I was taken by surprise at how difficult I found it to lift, position, or transfer my volunteer "patients," and at how extremely tired and sore I was at the end of each day. What was happening to me?

Upon reflection, I realized that two factors were involved. The first was normal change resulting from aging: the decrease in strength and endurance that occurs after age 40 among women. The second factor was the relatively sedentary lifestyle I had led since I had left bedside nursing. Mine was a classic case of functional decline from disuse, a major concern as aging occurs. As I thought further about it, I remembered that I had noticed groceries becoming heavier and stair climbing feeling more difficult. At the rate I was changing, I had little hope of maintaining my independence well into old age. In the shorter term, if I expected to keep teaching for a few more years, I would need to do something about my fitness level quickly!

My strategies? To use my gym membership (neglected for months and never attended routinely) four times per week from June through August and at least three times per week throughout the academic year, and to walk for no less than 30 minutes every day. No more avoiding stairs, either! I decided to walk up one floor and down two or three until that became easier and then increase stair climbing from there.

How will I know whether my plan has been effective? Although I don't expect to be as strong as I once was as a clinical nurse, I will be able to accomplish my teaching activities and my normal daily routines effortlessly, with minimal backaches and energy to spare.

Although it was a shock to recognize that aging had affected my personal and professional life, the ingrained nursing habits of reflection and of establishing goals helped me feel confident that I could manage them.

- After identifying nursing diagnoses, plan and implement interventions to increase activity and exercise, in collaboration with the patient when possible.
- Range-of-motion (ROM) exercises incorporated into daily activities can include one or all of the body's joints.

❖ CRITICAL THINKING EXERCISES

1. Mr. Neel is a 66-year-old man who retired from his job as a grocery store manager last year. He has hypertension, for which he takes hydrochlorothiazide, and is overweight. He is interested in beginning a regular exercise routine. What assessments should the nurse conduct prior to the patient starting an exercise program? What directions or guidelines would you give him?
2. Mrs. Wong has quadriplegia, weighs 72 kg, and requires total care. Her family has decided to care for her at home. As her

nurse, you are responsible for instructing the family on several aspects of Mrs. Wong's care. Develop a list of basic principles that describes safe lifting and positioning to protect Mrs. Wong's family members from injury.

❖ REVIEW QUESTIONS

1. Nurses must know and practise safe lifting, positioning, and transfer techniques in order to
 1. Increase their muscle strength
 2. Restore optimal patient functioning
 3. Reduce the risk of injury
 4. Assess the body alignment of patients
2. Proprioception is
 1. Awareness of the position of the body
 2. Needed for antigravity
 3. Located within the semicircular canals
 4. The individual's perception of movement at a joint
3. The Canadian Society of Exercise Physiology's 2011 *Canadian Physical Activity Guidelines* recommend that adults get
 1. 30 to 60 minutes of moderate intensity aerobic physical activity per day
 2. 60 to 120 minutes of moderate physical activity per week
 3. 150 minutes of moderate to vigorous intensity aerobic physical activity per week
 4. 30 minutes of moderate to vigorous intensity aerobic physical activity per day
4. Older adults are at greater risk for falls and injuries partly because
 1. They may take smaller steps, decreasing their base of support
 2. Their centre of gravity shifts toward the anterior
 3. They tend to walk more quickly, with wide strides
 4. Total bone mass decreases
5. Patients are more open to developing an exercise program if they
 1. Have been diagnosed with a chronic disease such as diabetes
 2. Are ordered by a physician to begin an exercise program
 3. Have had a family member request that they exercise
 4. Are at the stage of being ready to change their behaviour
6. Children becoming increasingly less physically active outside of school has resulted in
 1. An increase in juvenile arthritis
 2. An increase in obesity
 3. Improved school attendance and grades
 4. An increase in school-based fitness activities
7. The nurse's role in ensuring safe patient handling includes
 1. Using the health care agency's mechanical lift when previously trained on similar lifts
 2. Performing patient transfers alone, because there is no one else available to help
 3. Allowing other nurses to complete activities which appear unsafe
 4. Reporting unsafe patient handling equipment or situations to a supervisor

❖ RECOMMENDED WEB SITES

Active Living Alliance for Canadians with a Disability: <http://www.ala.ca/content/home.asp>

This organization is an alliance of individuals, agencies, and national associations that together promote, support, and enable Canadians with disabilities, across all settings and environments, to lead active and healthy lives.

Canadian Centre for Activity and Aging: <http://www.uwo.ca/actage/>

The centre is a research and community resource institution whose mandate is to investigate the interrelationship of physical activity and aging and to develop strategies, based on research, to promote the independence of older adults.

Canadian Fitness and Lifestyle Research Institute: <http://www.cflri.ca/>

The institute addresses the well-being of Canadians through research on and communication of information about physically active lifestyles to the public and private sectors.

Canadian Society for Exercise Physiology (CSEP): www.csep.ca
CSEP is the principal body for physical activity, health and fitness research, and personal training in Canada. It provides high-quality research, education, and training related to exercise physiology and science. It is the gold standard of health and fitness professionals and is dedicated to getting Canadians active safely by providing customized and specialized physical activity and fitness programs, as well as guidance and advice based on extensive training and evidence-based research.

Fitness Vancouver: <http://www.fitnessvancouver.ca/>

This Web site's Exercise Library contains an abundance of clearly described and well-illustrated exercises that any nurse could use to establish a fitness program.

Health Promotion Online: <http://www.phac-aspc.gc.ca/hp-ps/index-eng.php>

Health Canada maintains this Web site, which contains many useful health promotion resources and guides that will aid health care providers and community leaders in encouraging Canadians to take a more active role in improving their health.

Public Health Agency of Canada: <http://www.phac-aspc.gc.ca/chn-rcs/index-eng.php>

The role of this federal agency is to protect the health and safety of Canadians, focusing on preventing chronic diseases, preventing injuries, and responding to public health emergencies such as outbreaks of infectious diseases.

Public Services Health & Safety Association: www.healthandsafetyontario.ca

Public Services Health & Safety Association provides Ontario's public-service sector with information and strategies about how to achieve safer and healthier work environments for their workers. Regional and on-site prevention training, risk assessment, and safety consulting are used to identify and reduce workplace risks and hazards while preventing workplace injuries, illness, and disease.

Review Question Answers

1. 3; 2. 1; 3. 3; 4. 1; 5. 4; 6. 2; 7. 4

Rationales for the Review Questions appear at the end of the book.

Safety

Original chapter by Marinetta DeMoss, RN, MSN

Canadian content written by Daria Romaniuk, RN, PhD

objectives

Mastery of content in this chapter will enable you to:

- Define the key terms listed.
- Describe how the unmet basic physiological needs of oxygen, nutrition, temperature, and humidity can threaten patients' safety.
- Discuss the specific risks to safety related to each developmental stage.
- Discuss strategies to maintain nurse safety.
- Discuss the least-restraint approach.
- Describe the four categories of risks in a health care agency.
- Describe assessment activities designed to identify patients' physical, psychosocial, and cognitive statuses as they pertain to patients' safety status.
- Identify nursing diagnoses associated with risks to safety.
- Develop care plans for patients whose safety is threatened.
- Describe nursing interventions specific to patients' age for reducing the risk of falls, fires, poisonings, and electrical hazards.
- Describe methods to evaluate interventions designed to maintain or promote safety.

evolve WEBSITE

<http://evolve.elsevier.com/Canada/Potter/fundamentals/>

- Audio Chapter Summaries
- Examination Review Questions
- Glossary
- Skills Performance Checklists
- Video Clips
- Weblinks

key terms

Air pollution, p. 792
 Ambularm, p. 814
 Bed-Check, p. 814
 Carbon monoxide, p. 791
 Chemical restraint, p. 819
 Environment, p. 790
 Environmental restraints, p. 814
 Food poisoning, p. 791
 Hypothermia, p. 791
 Immunization, p. 792
 Land pollution, p. 792
 Material Safety Data Sheets (MSDSs), p. 794

Noise pollution, p. 792
 Pathogen, p. 792
 Physical restraint, p. 812
 Poison, p. 792
 Pollutant, p. 792
 Relative humidity, p. 791
 Restraint, p. 812
 Seizure, p. 795
 Seizure precautions, p. 820
 Water pollution, p. 792
 Workplace Hazardous Materials Information System (WHMIS), p. 794

Safety, often defined as freedom from psychological and physical injuries, is a basic human need that must be met. Health care provided in a safe manner and in a safe community environment is essential for a patient's survival and well-being. While incorporating critical thinking skills when following the nursing process, you are also responsible for assessing the patient and the environment for safety hazards as well as for planning and intervening appropriately to maintain a safe environment. By paying attention to patient safety, you are not only functioning as a provider of safe care but also as an active participant in health promotion. Nurses must also ensure their own safety as they provide patient care.

Scientific Knowledge Base

Environmental Safety

A patient's **environment** includes the physical and psychosocial factors that influence or affect the life and survival of that patient. This broad definition of environment crosses the continuum of care for settings in which you and patients interact (e.g., the home, community centre, school, clinic, hospital, and long-term care facility). Safety in health care settings reduces the incidence of illness and injury, shortens the length of treatment or hospitalization,

improves or maintains a patient's functional status, and increases the patient's sense of well-being. A safe environment affords protection to the staff as well, allowing them to function at an optimal level. A safe environment is one in which basic needs are met, physical hazards are reduced, the transmission of pathogens is reduced, sanitation is maintained, and pollution is controlled. In addition, in a safe environment, a plan is in place to respond to a possible terrorist attack.

Basic Needs. Physiological needs, which include sufficient oxygen and nutrition and the optimal temperature and humidity, influence a person's safety.

Oxygen. Be aware of factors in a patient's environment that decrease the amount of available oxygen. A furnace that is not properly vented or a car left running inside a closed garage may introduce carbon monoxide into the environment.

Carbon monoxide is a colourless, odourless, poisonous gas produced by the combustion of carbon or organic fuels. It binds strongly with hemoglobin, preventing the formation of oxyhemoglobin and thus reducing the supply of oxygen delivered to tissues (see Chapter 38). Exposure can cause nausea, headache, drowsiness, confusion, loss of consciousness, and death (Technical Standards and Safety Authority, 2004). Carbon monoxide detectors can be purchased for home use.

Nutrition. Meeting nutritional needs adequately and safely requires environmental controls and knowledge. In the home, the patient needs a refrigerator with a freezer compartment to keep perishable foods fresh. An adequate clean water supply is needed for drinking and to wash dishes and fresh produce. Provisions for garbage collection are necessary to maintain sanitary conditions.

Foods that are inadequately prepared or stored, or are subject to unsanitary conditions, increase a patient's risk for infections and food poisoning. Bacterial food infections result from eating food contaminated by bacteria such as *Escherichia coli* and *Salmonella*, *Shigella*, or *Listeria* organisms. **Food poisoning** is caused by the ingestion of bacterial toxins produced in food; staphylococcal and clostridial bacteria are the most common causes. Although most foodborne diseases are bacterial, the hepatitis A virus is spread by fecal contamination of food, water, or milk (Health Canada, 2004).

In illnesses caused by bacterial contamination, the onset of symptoms may be very rapid or take a week or even longer. For hepatitis A, the average incubation period is 28 to 30 days (Health Canada, 2004). Preventive measures include thorough handwashing before handling food, adequate cooking, and the proper storage and refrigeration of perishable foods.

For consumer protection, commercially processed and packaged foods are subject to the provisions of the *Food and Drug Act*, which regulates the manufacture, processing, and distribution of foods, drugs, and cosmetics. The Act protects consumers from the sale of impure or dangerous substances. Ensuring safe food supplies for Canadians is a joint effort between Health Canada, the Canadian Food Inspection Agency, and provincial, territorial, and municipal organizations.

Temperature and Humidity. The comfort zone for environmental temperature varies among individuals, but the usual comfort range is between 18.3°C and 23.9°C. Temperature extremes that frequently occur during the winter and summer affect not only comfort and productivity but also safety.

Exposure to severe cold for prolonged periods may cause frostbite and hypothermia. Frostbite occurs when a surface

area of the skin freezes as a result of exposure to extremely cold temperatures. **Hypothermia** occurs when the core body temperature is 35°C or below (see Chapter 30). Older adults; the young; patients with cardiovascular conditions; patients who have ingested drugs, alcohol, or other substances in excess; and the homeless are at high risk for hypothermia.

Exposure to extreme heat can raise the core body temperature, resulting in heatstroke or heat exhaustion. Chronically ill patients, older adults, and infants are at greatest risk for injury from extreme heat. These patients should avoid extremely hot, humid environments.

The relative humidity of the air in the environment may affect a patient's health and safety. **Relative humidity** is the amount of water vapour in the air compared with the maximum amount of water vapour that the air could contain at that temperature. The comfort zone varies from person to person, but most individuals are comfortable when the humidity is between 60% and 70%. Increasing the environmental humidity can have therapeutic benefits for patients with upper respiratory tract infections because humidity helps to liquefy pulmonary secretions and improve breathing. It is important to follow the manufacturer's directions regarding the cleaning and maintenance of home humidifiers to prevent water contamination.

Physical Hazards. Physical hazards in the environment place patients at risk for accidental injury and death. In Canada, unintentional injuries are the leading cause of death for individuals between the ages of 1 and 34 years (Public Health Agency of Canada, 2005) and are also a major cause of disability. Specific causes of injury and death include poisoning, suffocation, drowning, fires, burns, and machinery accidents. Among adults aged 65 and over, falls are the most common cause of unintentional injury (Canadian Institute for Health Information [CIHI], 2010). Many physical hazards, especially those contributing to falls, can be minimized through adequate lighting, the reduction of obstacles, and the implementation of security measures.

Lighting. Adequate lighting reduces physical hazards by illuminating the areas in which a person moves and works. Outside the home, all walkways should have adequate lighting. Outdoor lighting also helps protect the home and its inhabitants from crime. Well-lit garages, walkways, and doorways discourage intruders from entering or lurking on the premises.

Inside the house, halls, staircases, and individual rooms should be adequately lit so that residents can safely carry out activities of daily living. Night lights in dark halls, bathrooms, and the rooms of children, older adults, and guests help maintain safety. Glare is a major problem for older adults; therefore, strategies to minimize glare, such as the use of blinds and shades, are recommended (Ebersole et al., 2008).

Obstacles. Injuries in the home frequently result from tripping over or coming into contact with common household objects, including small rugs on the stairs and floor, wet spots on the floor, and clutter on surfaces. The risk of falls from obstacles is present for all age groups; however, it is greatest for older adults. Falls are usually the result of a combination of intrinsic risk factors (e.g., illness, drug therapy, or alcohol use) and extrinsic or environmental factors. In some cases, an obstacle or extrinsic factor may be the only cause of a fall. Intrinsic factors may be difficult to modify or eliminate, but extrinsic factors are usually easily removed.

Fire. Fire kills, on average, eight Canadians each week, and 73% of these deaths occur as a result of fire in the home (Fire Prevention Canada, 2011). Most of these deaths are due to smoke inhalation. The most common causes of fire are careless smoking and cooking accidents.

Poisoning. A **poison** is any substance that impairs health or destroys life when ingested, inhaled, or otherwise absorbed by the body. Individuals can be at risk for poisoning from substances such as cleaning agents, medications, and plants. Specific antidotes or treatments are available for only some types of poisons. The capacity of body tissue to recover from the poison determines the reversibility of the effect. Poisons can impair the respiratory, circulatory, central nervous, hepatic, gastrointestinal (GI), and renal systems of the body.

Lead poisoning from various sources is an important safety concern. Although Canadian regulations have restricted the lead content of paint since 1976, older homes may still have high lead levels because of old paint. Lead may also be found in contaminated water systems and in household articles such as vinyl blinds and candles. Exposure to lead may occur through oral ingestion, inhalation, or the skin. Fetuses, infants, and children are more vulnerable to lead poisoning than adults because lead is more easily absorbed into their growing bodies. As well, small children are more sensitive to the damaging effects of lead. Exposure to excessive levels of lead can lead to vomiting, headaches, anemia, weight loss, poor attention span, slowed speech development, and learning difficulties (Health Canada, 2009).

Security. An insecure home places a patient at risk for injury or burglary. Inadequate locks on doors and windows make the home susceptible to intruders. A lack of attention to personal safety can place the patient at risk for injury away from home as well, for example, when walking or driving after dark.

Transmission of Pathogens. A **pathogen** is a microorganism capable of producing an illness. Medical asepsis reduces the transfer of organisms (see Chapter 32). One of the most effective methods of limiting pathogen transmission is the aseptic practice of hand hygiene. Patients must be instructed in proper hand-hygiene techniques and encouraged to use them frequently in the home and hospital.

The transmission of disease from person to person can also be reduced, and in some cases prevented, by immunization. **Immunization** is the process by which resistance to an infectious disease is produced or augmented. Active immunity is acquired by injecting a small amount of attenuated (weakened) or dead organisms or modified toxins from the organism (toxoids) into the body. Passive immunity occurs when antibodies produced by other individuals or animals are introduced into a person's bloodstream for protection against a pathogen.

Human immunodeficiency virus (HIV)—the pathogen that causes acquired immunodeficiency syndrome (AIDS)—and hepatitis B virus are transmitted through blood and other body fluids.

Substance abusers frequently share syringes and needles; this practice increases the risk of acquiring these viruses. Safer sex practices (see Chapter 26), including the correct use of condoms and engaging in monogamous relationships, reduce the risk for both of these diseases and for other sexually transmitted infections. The hepatitis C virus is bloodborne and can be spread through injection drug use as well as with body piercing or tattooing. You maintain your own safety as well as

that of patients and other people in the health care setting when you use standard precautions and routine practices during care for all patients to prevent the spread of infection and contact with blood and body fluids (see Chapter 32).

At the community level, the transmission of disease is also controlled through the adequate disposal of human waste through the proper construction and repair of sewers and drains. Rodent and insect control (e.g., spraying for mosquitoes) is also necessary to reduce the transmission of disease.

Pollution. A healthy environment is free of pollution. A **pollutant** is a harmful chemical or waste material discharged into the water, soil, or air. People commonly think of pollution only with regard to air, land, or water pollution, but excessive noise can also be a form of pollution that presents health risks. **Air pollution** is the contamination of the atmosphere with a harmful chemical. Prolonged exposure to air pollution increases the risk of pulmonary disease. In urban areas, industrial waste and vehicle exhaust are common contributors to air pollution. Cigarette smoke is a common cause of air pollution. **Land pollution** can be caused by the improper disposal of radioactive and bioactive waste products (e.g., dioxin).

Water pollution is the contamination of lakes, rivers, and streams, usually by industrial pollutants. Water-treatment facilities filter harmful contaminants from the water, but these systems can contain flaws. If water becomes contaminated, the public must use bottled or boiled water for drinking and cooking. Flooding frequently causes damage to water-treatment stations, which also necessitates the use of bottled or boiled water. Another hazard is the contamination of water with nitrates, chemicals made up of nitrogen and oxygen. These chemicals occur naturally in soil and may also be added through the use of fertilizers; contamination of well water may occur when nitrates leach out of the soil into the water (Government of Saskatchewan, 2008). Nitrates pose a hazard to our health, particularly for pregnant women and infants, who are more susceptible to methemoglobinemia, an illness that occurs when ingested nitrates are converted to nitrites in the body (Government of Saskatchewan, 2008). The nitrites disrupt the oxygen-carrying capacity of the blood, causing cyanosis, shortness of breath, and fatigue. Routine testing of municipal water supplies for nitrates ensures that levels are maintained within the accepted limit of less than 10 mg/L nitrate-nitrogen. However, you may need to educate individuals with private wells about arranging for annual testing of their water (Government of Saskatchewan, 2008).

Noise pollution occurs when the noise level in an environment becomes uncomfortable to the inhabitants of the environment. Noise levels are measured in units of sound intensity called decibels. Tolerance for noise varies from individual to individual and is influenced by health status. Irreversible hearing loss may result from constant exposure to high sound intensity. Patients working in environments with high noise levels should wear protective devices to reduce hearing loss (Figure 36-1). Adolescents should limit their exposure to intense noise such as that encountered at rock concerts.

A health care facility can also be polluted by noise. The sounds of machines, people talking, intercoms, and paging systems can create increased noise levels. Even when the noise level is not high enough to affect hearing acuity, it can produce a syndrome called sensory overload, which is a marked increase in the intensity of auditory and visual stimuli. It disrupts processing of information, and the patient no longer perceives the environment in a meaningful way (see Chapter 47).



Figure 36-1 Protective device to reduce hearing loss.

Terrorism. A more recent potential environmental health threat is the possibility of a terrorist attack. The terrorist attacks in the United States on September 11, 2001 raised awareness of this threat for Canadians. If a terrorist health threat were to occur in Canada, Health Canada would work with provincial, territorial, and local health officials to address the situation. Hospitals are one of several components of a community's emergency response plan (Christian et al., 2005). You must be prepared through education and training to respond to an attack by taking the necessary steps to participate in your agency's role in the community's emergency management plan.

Nursing Knowledge Base

In addition to being knowledgeable about the environment, you must be familiar with a patient's developmental level; mobility, sensory, and cognitive statuses; and lifestyle choices. You must also be aware of common safety precautions and of the special risks to safety that are found in agency settings.

Risks at Developmental Stages

A patient's developmental stage presents specific threats to safety. Patients throughout all developmental stages may be subject to abuse. Child abuse, domestic violence, and abuse of older adults are serious threats to safety. These topics are discussed in Chapters 23, 24, and 31.

Infants and Children. Unintentional injuries are the leading cause of death in Canadian children between the ages of 1 and 14 years; each year 1 of every 230 children is hospitalized for treatment of unintentional injuries (Safe Kids Canada, 2007). The nature of the injuries sustained is related to normal growth and development. Small children are curious and trusting of their environment and do not perceive themselves to be in danger. The incidence of poisoning is highest in late infancy and toddlerhood because of children's increased level of oral activity and growing ability to explore the environment. Toddlers and preschoolers, who are attracted to water but do not perceive its dangers, are at a greater risk for drowning. Childhood injuries are also reflective of adults' perceptions of the causes of accidents and their ability to prevent them. For example, the incorrect use of vehicle restraints for children aged 5 to 14 places these children at greater risk of death from injuries sustained in motor vehicle accidents (the leading cause

BOX 36-1

Changes Associated With Aging That Increase the Risk of Accidents

Musculoskeletal Changes

Muscle strength and function decrease, joints become less mobile, bones are more brittle due to osteoporosis, postural changes (e.g., kyphosis) are common, and range of motion is limited.

Nervous System Changes

All voluntary or automatic reflexes slow to some extent, the ability to respond to multiple stimuli decreases, and sensitivity to touch is decreased.

Sensory Changes

Peripheral vision and lens accommodation decrease, lenses may develop opacity (cataracts), the stimuli threshold for light touch and pain increases, the transmission of hot and cold impulses is delayed, and hearing is impaired as high-frequency tones become less perceptible.

Genitourinary Changes

Nocturia and occurrences of incontinence increase.

Source: Adapted from Ebersole, P., Hess, P., Touhy, T. A., Jett, K., & Luggen, A. (2008). *Toward healthy aging: Human needs and nursing response* (7th ed.). St Louis, MO: Mosby.

of death from injury in this age group) (Safe Kids Canada, 2007).

Adolescents. As children enter adolescence, they develop greater independence and begin to develop a sense of identity and their own values. Adolescents start to separate emotionally from their families, and peers generally have a stronger influence on them. The struggle for identity may cause a teenager to experience shyness, fear, and anxiety, with resulting dysfunction at home or school. In an attempt to relieve the tensions associated with physical and psychosocial changes, as well as peer pressures, adolescents may begin to act impulsively and engage in risk-taking behaviours such as smoking and substance use. In addition to the health risks posed by nicotine and other substances (e.g., alcohol, drugs, glue), the ingestion of such substances increases the incidence of accidents such as drowning and motor vehicle accidents.

Adults. Threats to an adult's safety are frequently related to lifestyle habits. For example, a patient who consumes excessive alcohol is at greater risk for motor vehicle accidents. A long-term smoker has a greater risk of cardiovascular and pulmonary diseases. Likewise, an adult experiencing a high level of stress is more likely to have an accident or illnesses such as headaches, GI disorders, and infections.

Older Adults. The physiological changes that occur during the aging process increase a patient's risk for injury (Box 36-1). Changes in vision, hearing, mobility, reflexes, circulation, and the ability to make quick judgements predispose older adults to falls (see Chapter 24). When a patient is hospitalized, confusion, multiple medical problems, medications, immobility, urinary urgency, age-related sensory changes, postural instability, and an unfamiliar environment further contribute to the risk of falls (Meiner & Leuckenotte, 2006). Certain disease states common to older adults, such as arthritis and cerebrovascular accidents, also increase the chances of injury. In 2007–08, unintentional falls were the most common cause of injury in adults aged 65 years and older, with 70% of injuries

in this age group caused by falls (Canadian Institute for Health Information [CIHI], 2010). Patients most often fall while transferring from beds, chairs, and toilets; while getting into or out of a bathtub; by tripping over carpet edges or doorway thresholds; by slipping on wet surfaces; and while descending stairs. Icy walkways and obstacles in the yard are also common causes of outdoor falls in older adults.

Individual Risk Factors

Other risk factors posing threats to safety are lifestyle, impaired mobility, sensory or communication impairment, and a lack of safety awareness.

Lifestyle. Lifestyle can increase safety risks. Individuals who drive or operate machinery while under the influence of chemical substances, who work at inherently dangerous jobs, or who are risk takers are at greater risk of injury. In addition, individuals experiencing stress, anxiety, fatigue, or alcohol or drug withdrawal and those taking prescribed medications may be more accident prone. These patients may also be too preoccupied to notice a source of potential accidents, such as cluttered stairs or a road intersection.

Impaired Mobility. Impaired mobility due to muscle weakness, paralysis, or poor coordination or balance is a major factor in patient falls. Immobilization predisposes a patient to additional physiological and emotional hazards, which can in turn further restrict mobility and independence.

Sensory or Communication Impairment. Patients with visual, hearing, tactile, or communication impairment, such as aphasia or a language barrier, are at greater risk for injury. Such patients may not be able to perceive a potential danger or express their need for assistance (see Chapter 47).

Lack of Safety Awareness. Some patients are unaware of safety precautions, such as keeping medicine or poisons away from children or observing the expiration date on food products. A complete nursing assessment, including a home inspection, helps you identify the patient's level of knowledge regarding home safety so that deficiencies can be corrected with an individualized nursing care plan.

Risks in the Health Care Agency

You must also be aware of specific risks to your patients and to yourself that exist in health care agencies.

Workplace Risks. Various forms of chemicals used in health care settings are a source of environmental risk for both the patient and the health care worker. Chemicals such as mercury and those found in some medications, anaesthetic gases, cleaning solutions, and disinfectants are potentially toxic if ingested or inhaled. The **Workplace Hazardous Materials Information System (WHMIS)** sets the standards for the control of hazardous substances in workplaces across Canada (Health Canada, 2008). A hazardous substance is any product or material that could cause physical or medical problems. WHMIS consists of three main elements: worker education programs, cautionary labelling of products, and the provision of **Material Safety Data Sheets (MSDSs)**. Cautionary labels display the product's physical and health hazards and safety and first aid measures, and identify the types of hazard that the product presents (Figure 36-2). MSDSs provide detailed information about the substance, any health hazards imposed, precautions for safe handling and use, and steps to take if the substance is released or spilled. You must understand WHMIS labelling requirements and be aware of the location of MSDSs where you work.

Controlling the spread of infection through the consistent use of routine practices maintains the safety of patients, staff, and visitors (see Chapter 32). The importance of these measures was illustrated during the outbreak of severe acute respiratory syndrome (SARS) in Toronto in 2003. The illness began with one individual admitted to an emergency department and spread to several patients and staff before its infectious nature was recognized and precautions were instituted.

Violence may be directed toward nurses from patients or patients' family members. Factors that can contribute to abusive situations include insufficient staffing levels, violation of patients' personal space due to lack of privacy, and the provision of care that requires close physical contact (Canadian Nurses Association, 2005). Violence toward nurses can take the form of threats, intimidation, and physical behaviours such as throwing objects (College of Registered Nurses of Nova Scotia, 2007). You should not tolerate abuse from patients; seek assistance from co-workers to help you manage abusive situations. If you perceive that you are in danger and that the risk to you is greater than the risk to the patient if you withdraw care, you should remove yourself from the situation and seek assistance from other team members (College of Nurses of Ontario, 2009a). You should report all incidents of workplace violence, as this is essential to the development of effective strategies to reduce such occurrences.

Risks to Patient Safety. Specific risks to a patient's safety within the health care environment include falls, patient-inherent accidents, procedure-related accidents, and equipment-related accidents. Assess for these four potential problem areas and take steps to prevent or minimize accidents. When an accident occurs, file an incident report (also called *adverse occurrence report*). This report is a confidential document that completely describes any patient accident occurring on the premises of a health care agency (see Chapter 15). The report documents the accident, the patient assessment, and interventions carried out for the patient. In addition to completing the incident report, you must objectively document the incident in the patient's medical record. Because this is a confidential document, the completion of the incident report should not be mentioned in the medical record because this eliminates the health care agency's protective clause.

Falls. Falls account for up to 90% of all reported incidents in hospitals. In addition to age, a history of previous falls, gait disturbance, balance and mobility problems, postural hypotension, sensory impairment, urinary and bladder dysfunction, use of medications, and certain medical diagnostic categories (e.g., cancer and cardiovascular, neurological, and cerebrovascular diseases) increase the risk of falling. One of the more common factors precipitating a fall is a patient's attempt to get out of bed to use the toilet. Hip fractures are among the most serious fall-related injuries. Between April 2003 and March 2006, the rate of hip fracture in Canadian seniors during admission to hospital was close to one in 1000 (CIHI, 2007). Older adults with a hip fracture may have a long period of recovery and may not be able to return to their previous level of functioning, even losing their ability to live independently (SMARTRISK, 1998). Falls that result in injuries can extend a patient's length of stay in the health care environment, placing the patient at a greater risk for other complications.

Patient-Inherent Accidents. Patient-inherent accidents are accidents (other than falls) in which the patient is the primary reason for the accident. Examples are self-inflicted

Symbol	Name	Description
	Flammable and combustible material	Product may catch fire when exposed to heat, sparks, or flame.
	Oxidizing material	Product may cause a fire or explosion if exposed to combustible material.
	Compressed gas	Product is under high pressure. May explode or burst when heated, dropped, or damaged.
	Corrosive material	Product can cause burns to eyes, skin, or respiratory system.
	Dangerously reactive material	Product may react with light, heat, extreme temperatures, or vibration causing explosion, fire, or release of poisonous gases.
	Poisonous and infectious material: immediate and serious toxic effects	Product may be fatal or cause serious or permanent damage if exposed to even once.
	Poisonous and infectious material: other toxic effects	Product may cause cancer, birth defects, or other permanent damage if exposed to repeatedly.
	Poisonous and infectious material: biohazardous and infectious material	Product may cause disease, serious illness, or death.

Figure 36-2 Workplace Hazardous Materials Information System hazard symbols. **Source:** Adapted from the Canadian Centre for Occupational Health and Safety. (2009). *WHMIS labelling requirements*. Retrieved from http://www.ccohs.ca/oshanswers/legisl/msds_lab.html#.

cuts, injuries, and burns; the ingestion or injection of foreign substances; self-mutilation or fire setting; and pinching fingers in drawers or doors. A patient-inherent accident may occur as a result of a **seizure**, a sudden and abnormal discharge of neurons in the brain leading to alterations in sensation, behaviour, movement, perception, or consciousness (Black & Hawks, 2009). Accidental injuries may occur during a seizure if patients hit themselves against an object such as a bed rail or the floor.

Procedure-Related Accidents. Procedure-related accidents are those that occur during therapy. They include medication and fluid administration errors, the improper application of external devices, and accidents related to the improper performance of procedures (e.g., incorrect Foley catheter insertion).

In a study of Canadian hospitals, Baker et al. (2004) found that 7.5% of patients were affected by medical errors during their hospital stay. The most common errors were related to surgical procedures and drug or fluid administration. In 15.9% of these cases, the errors resulted in the death of a patient. Etchells et al. (2008) stress that although medication errors cannot be avoided completely, systems can be designed to minimize the possibility and severity of errors. Providing safe care is an important concern for Canadian nurses (Canadian Nurses Association & University of Toronto Faculty of Nursing,

2004). Nurses and health care facilities must build safety into processes of care and take a systems approach when making efforts to reduce medical errors.

You can prevent many procedure-related accidents (Box 36-2). For example, strictly following the procedure for administering medications prevents medication errors (see Chapter 33). The potential for infection is reduced when surgical asepsis is used for sterile dressing changes or any invasive procedure, such as insertion of a Foley catheter. Finally, the correct use of lifting devices reduces the risk of injuries to yourself and to your patient during transferring and lifting (see Chapter 45). Before moving a patient, begin with an assessment of the patient's capabilities, in particular their ability to weight bear (Canadian Centre for Occupational Health and Safety, 2002). A patient who can bear weight on at least one leg may be transferred with assistance, but you should always use a mechanical lift with a patient who cannot weight-bear. You also need to consider your weight and size relative to the patient's when making decisions about moving patients.

safety alert Always follow agency policy when using lifting devices, and do not use them by yourself. Student nurses should always work with qualified personnel when using these devices.

► BOX 36-2

Nine Life-Saving Patient Safety Solutions

- *Be aware of look-alike and sound-alike medication names.* Carefully review the medication orders of these drugs and use the six rights of medication safety.
- *Use patient identification.* Use two forms of patient identification, such as a hospital arm band and medical record number.
- *Communicate during patient handover.* Communicate critical information, provide time for health care personnel to ask and resolve questions, and involve the patient and family during a handover process.
- *Perform correct procedure at correct body site.* Mark the operative site and take a "time out" to verify that you have identified the correct patient, operative site, and procedure before initiating the procedure.
- *Control concentrated electrolyte solutions.* Use the six rights of medication administration, and follow your agency's protocols for these solutions.
- *Ensure medication accuracy at transitions in care.* Perform medication reconciliation at each health care transition. During admission, transfer, and discharge, compare all medications a patient is taking against the medical order and against the patient's "home medication list."
- *Avoid catheter and tubing misconnections.* Be meticulous in your verification of the catheter and tubing connections, of the correct catheter, and of the correct connection tubing. Label tubing and connections when a patient has multiple catheters.
- *Do not reuse single-use injection devices.* Never reuse needles, injection devices, or intravenous catheters.
- *Improve hand hygiene to prevent health care-associated infections.* Perform hand hygiene before and after each patient encounter and after contact with contaminated objects (even when gloves are worn). Encourage family and visitors to perform hand hygiene before and after visits.

Source: Courtesy of the World Health Organization Collaborating Centre for Patient Safety Releases. (2007, May 2). *Nine patient safety solutions*. Retrieved from <http://www.who.int/mediacentre/news/releases/2007/pr22/en/index.html>.

Equipment-Related Accidents. Equipment-related accidents result from the malfunction, disrepair, or misuse of equipment or from an electrical hazard. For example, a too-rapid infusion of intravenous (IV) fluids may result from a dysfunctional IV pump. To avoid accidents, do not operate monitoring or therapy equipment without instruction. A checklist should be used to assess potential electrical hazards to reduce the risk of electrical fires, electrocution, or injury from faulty equipment. In health care settings, clinical engineering staff makes regular safety checks of equipment.

Critical Thinking

Successful critical thinking requires a synthesis of knowledge, experience, information gathered from patients, critical thinking qualities, and intellectual and professional standards. Clinical judgements require you to anticipate necessary information, analyze the data, and make decisions regarding patient care. Critical thinking is an ongoing process. During assessment (Figure 36-3), you need to consider all critical thinking

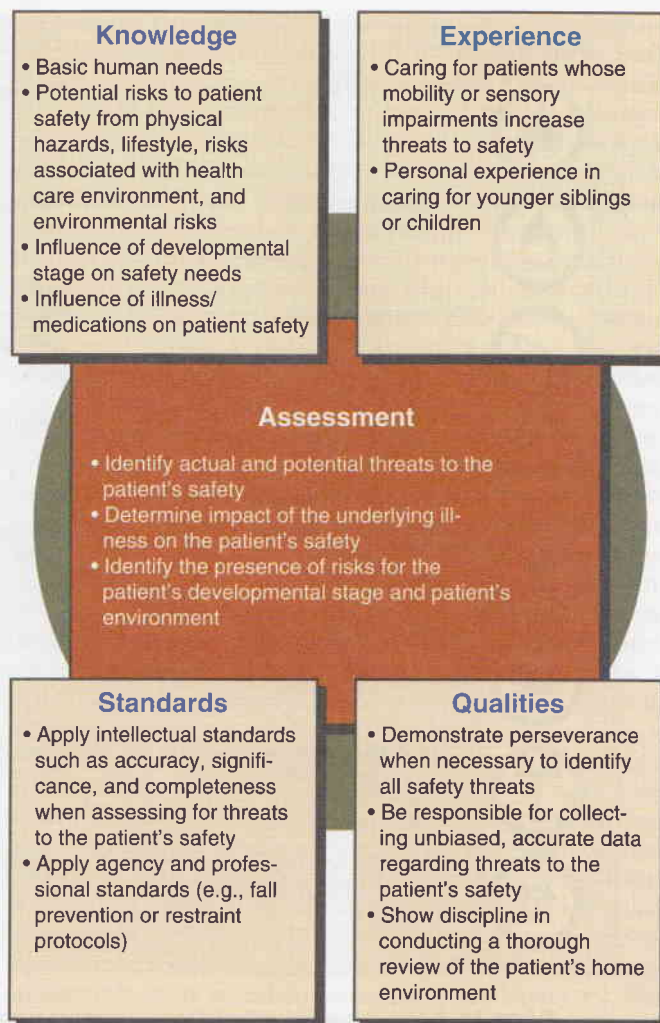


Figure 36-3 Critical thinking model for safety assessment.

elements as well as information about the specific patient to make appropriate nursing diagnoses.

In the case of safety, you integrate knowledge from nursing and other scientific disciplines, previous experiences in caring for patients who had an injury or were at risk, critical thinking qualities such as perseverance, and any standards of practice that are applicable. Agency guidelines and professional nursing associations provide standards for nursing activities such as medication administration, fall-prevention steps, and infection control to guide nurses in the provision of safe care. For example, the Registered Nurses' Association of Ontario (2005) has published *Prevention of Falls and Fall Injuries in the Older Adult*. You refer to all this information and experience as you conduct a detailed assessment of a specific patient. For example, while assessing a patient's home environment, you consider typical locations within the home where dangers commonly exist. If a patient has a visual impairment, you apply previous experience in caring for patients with visual changes to anticipate how to thoroughly assess the patient's needs. Critical thinking directs you to anticipate what needs to be assessed and how to make conclusions about available data.

Safety and the Nursing Process

❖ Assessment

To conduct a thorough patient assessment, consider possible threats to a patient's safety, including the patient's immediate environment, as well as any individual risk factors.

Health History

By conducting a health history, you gather data about the patient's level of wellness to determine if any underlying conditions exist that pose threats to safety. For example, you give special attention to assessing the patient's gait, muscle strength and coordination, balance, and vision. A review of the patient's developmental status must be considered as assessment information is analyzed. Also review whether the patient has been exposed to any environmental hazards or is taking medications or undergoing procedures that pose risks. For example,

the use of diuretics increases the frequency of voiding and may result in the patient having to use toilet facilities more often. Falls often occur when patients get out of bed quickly because of urinary urgency.

Patient's Home Environment

When caring for a patient in the home, a home hazard assessment is necessary (Box 36-3). Walk through the home with the patient and discuss how the patient normally conducts daily activities. Key areas to inspect are the bathroom, kitchen, and areas with stairs. For example, when assessing the adequacy of the lighting, you inspect areas where the patient moves and works, such as outside walkways, steps, interior halls, and doorways. Getting a sense of the patient's routine helps you recognize less obvious hazards.

Assessment for the risk of food infection or poisoning involves obtaining a detailed dietary assessment for the previous week; conducting an examination of GI and central

► BOX 36-3 Home Hazard Assessment

Home Exterior

- Are sidewalks uneven?
- Are steps in good repair?
- Is ice and snow removal adequate?
- Do steps and balconies have securely fastened railings?
- Is lighting present and adequate?
- Is outdoor furniture sturdy?
- Are window screens in high-rise apartments properly secured?

Home Interior

- Do all rooms, stairways, and halls have adequate, nonglare lighting?
- Are night lights available?
- Are area rugs secured?
- Are wooden floors nonslippery?
- Are floors where water accumulates covered by nonslip floor mats?
- Is furniture placed appropriately to permit mobility? Is furniture sturdy enough to provide support for getting up and down?
- Are temperature and humidity within normal ranges? Are any steps or thresholds present that may pose a hazard? Are step edges clearly marked with coloured tape? Are handrails available and secure?
- In homes with young children, are window guards and electrical outlet covers installed?
- Can all doors and windows with security gates and locks be opened from the inside without a key?

Kitchen

- Are handwashing facilities available?
- Is the pilot light on for the gas stove?
- Are the stovetop and oven clean?
- Are the dials on the stove readable?
- Are storage areas within easy reach?
- Are fluids such as cleaners and bleach in original containers and stored properly?
- In homes with young children, are safety locks on cabinets and corner counter protectors installed?
- Is the water temperature within a normal range?
- Do clean areas for food storage and preparation exist? Is refrigeration adequate? Are the refrigerator and freezer temperatures correct?

Bathroom

- Are handwashing facilities available?
- Does the tub or shower have skid-proof strips or surfaces? Are bath mats secured?
- Does the patient need grab bars near the bathtub and toilet? Does the patient need an elevated toilet seat?
- Is the medicine cabinet well lit?
- Are medications in their original containers?
- If children live in the home or visit, are medication containers child resistant?
- Have outdated medications been discarded?

Bedroom

- Are beds of adequate height for getting on and off easily?
- Is lighting adequate for both day and night?
- Are floor coverings nonskid?
- Does the patient have a telephone nearby?
- Are emergency numbers visible near the telephone?

Electrical and Fire Hazards

- Are smoke and carbon monoxide detectors installed? Are the batteries for all detectors tested every month and changed twice a year?
- Have the furnace, chimney, and stove been checked for proper ventilation?
- Are extension cords in good condition and used appropriately?
- Are appliances in good working order?
- Are electrical appliances located away from water sources? Is a multipurpose fire extinguisher near the cooking area, and does patient understand how to use it?
- Are combustible items such as oil-based paints, gasoline, and oily rags stored in a garage or basement?
- Are electrical outlets overloaded?
- Are flashlights available?
- Is a first aid kit available to the adult members of the household?
- Does everyone in the family know the fire escape plan and have easy access to emergency phone numbers?

Sources: Ebersole, P., Hess, P., Touhy, T. A., Jett, K., & Luggen, A. (2008). *Toward healthy aging: Human needs and nursing response* (7th ed.). St Louis, MO: Mosby; and McCullagh, M. C. (2006). Home modification: How to help patients make their homes safer and more accessible as their abilities change. *American Journal of Nursing*, 106(10), 54.

► TABLE 36-1 Hendrich II Fall Risk Model™

Risk Factor	Risk Point	Score
Confusion/Disorientation/Impulsivity	4	
Symptomatic Depression	2	
Altered Elimination	1	
Dizziness/Vertigo	1	
Gender (Male)	1	
Any Administered Antiepileptics (Anticonvulsants): carbamazepine, divalproex sodium, ethosoin, ethosuximide, felbamate, fosphenytoin, gabapentin, lamotrigine, mephenytoin, methsuximide, phenobarbital, phenytoin, primidone, topiramate, trimethadione, valproic acid ¹	2	
Any Administered Benzodiazepines: ² alprazolam, chloridiazepoxide, clonazepam, clorazepate dipotassium, diazepam, flurazepam, halazepam, ³ lorazepam, midazolam, oxazepam, temazepam, triazolam	1	
Get-Up-and-Go Test: "Rising from a Chair"		
If unable to assess, monitor for change in activity level, assess other risk factors, document both on patient chart with date and time.		
Ability to rise in a single movement—No loss of balance with steps	0	
Pushes up, successful in one attempt	1	
Multiple attempts but successful	3	
Unable to rise without assistance during test	4	
If unable to assess, document this on the patient chart with the date and time		
(A score of 5 or greater = High Risk)		
	TOTAL SCORE	

Ongoing medication review updates:

1. Levetiracetam (Keppra) was not assessed during the original research conducted to create the Hendrich Fall Risk Model. As an antiepileptic, levetiracetam does have side effects of somnolence and dizziness, which contribute to its fall risk and should be scored (effective June 2010).

2. The study did not include the effect of benzodiazepine-like drugs since they were not on the market at that time. However, due to their similarity in drug structure, mechanism of action, and drug effects, they should also be scored (effective June 2010).

3. Halazepam was included in the study but is no longer available in the United States (effective June 2010).

Source: Copyright © 2012 by AHI of Indiana, Inc. All rights reserved. U.S. Patent No. 7,282,031 and U.S. Patent No. 7,682,308. Reproduction of copyright and patented materials without authorization is a violation of federal law.

nervous system functions; observing for a fever; and analyzing the results of cultures of feces and vomitus. Suspected food and water sources are also studied. In addition, you should assess the patient's handwashing practices. It is useful to ask patients when they routinely wash their hands, as this can prompt a discussion about the purpose and importance of handwashing.

An assessment of the environmental comfort of the patient's home should include a review of when the patient normally has heating and cooling systems serviced. Does the patient have a functional furnace or space heater? Does the home have air conditioning or fans? Patients who use space heaters must be informed of the risk for fires.

When patients live in older homes, encourage an inspection for the presence of lead in paint, dust, or soil. Because lead can also come from the solder of plumbing fixtures in a home, water from each faucet should also be tested. Local health offices can assist a homeowner in locating a trained lead inspector who will take samples from various locations and have them analyzed at a laboratory for lead content.

Health Care Environment

When a patient is cared for within a health care facility, you must determine if any hazards exist in the immediate care environment. Does the placement of equipment or furniture pose barriers to ambulation? Does the positioning of the patient's bed allow the patient to reach items on a bedside table? Does the patient need assistance with ambulation? Is the patient aware of activity restrictions? Has the patient been taught to use the call bell, and is it within reach? Collaborate with clinical engineering staff to make sure that

equipment has been assessed to ensure its proper function and condition.

Risk for Falls

Assessment of the patient's fall risk factors is essential in determining specific needs and targeting interventions to prevent falls. A fall assessment tool (Table 36-1) can help you determine potential risks before accidents and injuries result. The tool shown in Table 36-1 is the Hendrich II Fall Risk Model. This tool, which is intended for use in acute care settings, takes into account the patient's ability to move independently, as well as other factors that can increase the risk for falls, such as certain types of medications (Gray-Miceli, 2007). Familiarize yourself with the fall assessment tool used in your clinical area as such tools vary among agencies. Patients should be assessed for their risk of falls on admission to the health care setting; an assessment should also be completed after a fall, to determine why the fall occurred, as patients who have fallen are at much greater risk of falling again (Gray-Miceli, 2007; Registered Nurses' Association of Ontario, 2005). In many cases, family members can be significant resources in assessing a patient's fall risk. Families often are able to report on the patient's level of confusion and ability to ambulate.

Risk for Medical Errors

Be alert to factors within your environment that create conditions in which medical errors are more likely to occur. Studies indicate that overwork and fatigue cause a significant decrease in alertness and concentration, leading to errors (Trinkoff et al., 2006). You need to be aware of these factors and include checks and balances when working under stressful conditions. For

example, checking the patient's identification bracelet before beginning any procedure or administering any medication can reduce the risk for error.

The National Steering Committee on Patient Safety (2002) made recommendations to improve the safety of Canada's health care system. At the core of these recommendations was the need to nurture a culture of safety within the system. The Canadian Patient Safety Institute (CPSI) was established in 2003 to provide leadership in the development of such a culture.

Patient Expectations

Patients generally expect to be safe in their home and in the health care setting. However, a patient's viewpoint of what is safe may differ from your viewpoint. For this reason, any assessment must include the patient's understanding of his or her perception of risk factors. This information will be important later if you need to make changes in the patient's environment. Patients usually do not purposefully put themselves in jeopardy. When patients are uninformed or inexperienced, threats to their safety can occur. Patients must always be consulted on ways to reduce hazards in their environment.

❖ Nursing Diagnosis

After completing an assessment of a patient's safety status, review any clusters of data to identify patterns suggesting that safety is threatened. Defining characteristics and related factors from the data guide you in identifying appropriate nursing diagnoses (Box 36-4).

The related factors become the basis for selecting nursing therapies. For example, *risk for injury related to impaired mobility* and *risk for injury related to barriers in the home environment* require different nursing interventions. The patient with altered mobility may require ambulatory aids and physiotherapy. When the related factor is barriers in the home, you recommend changes that will create a safer environment. At

times, as in the example in Box 36-4, multiple related factors may apply. Examples of nursing diagnoses that may apply for patients whose safety is threatened are the following:

- *Impaired home maintenance—risk for imbalanced body temperature*
- *Impaired home maintenance—risk for injury*
- *Deficient knowledge—risk for poisoning*
- *Disturbed sensory perception—risk for suffocation*
- *Disturbed thought processes—risk for trauma*

❖ Planning

During planning, you critically synthesize information from multiple sources (Figure 36-4). Critical thinking ensures that the patient's plan of care integrates all that you have learned about the patient, as well as the key critical thinking elements. For example, reflect on knowledge regarding the services that other disciplines (e.g., occupational therapy) can provide in helping the patient return home safely, as well as on any previous experience wherein a patient benefited from safety interventions. Such experience helps you adapt approaches with a new patient. Applying critical thinking qualities such as creativity helps you and the patient collaborate in planning interventions that are relevant and most useful, particularly when changes are made in the home environment.

► BOX 36-4 NURSING DIAGNOSTIC PROCESS

Assessment Activities	Defining Characteristics	Nursing Diagnosis
Observe patient's mobility and body alignment.	Uncoordinated gait Poor posture	<i>Risk for injury related to impaired mobility, decreased vision, poorly lit home, and cluttered environment</i>
Ask patient about visual acuity.	Reports difficulty seeing at night Reports tripping over rugs and furniture	
Complete a home hazard appraisal.	Poorly lit home Rooms filled with small items Excessive amount of furniture for size of room Rugs not secure	

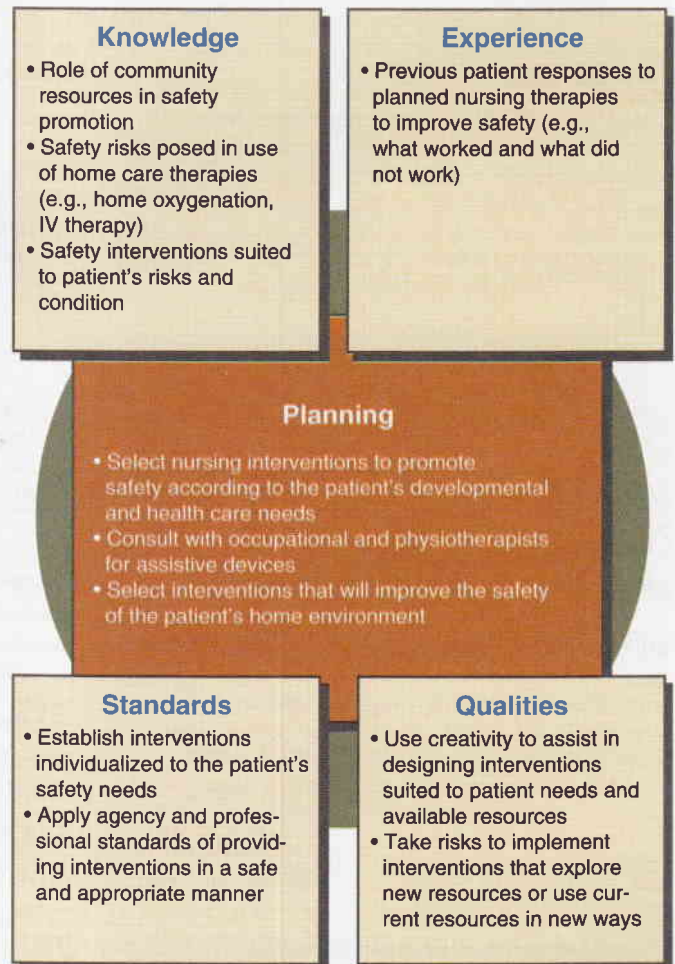


Figure 36-4 Critical thinking model for safety planning. IV, intravenous.

Goals and Outcomes

Planning and goal setting need to be done in collaboration with the patient, family, and other members of the health care team (Box 36-5). The patient who is an active participant in reducing threats to safety will be more alert to potential hazards. Goals and outcomes must be measurable and realistic, with consideration of the resources available to the patient. The overall goal for a patient with a threat to safety is to remain free from injury. The following are examples of expected outcomes that focus on a patient's need for safety:

- Modifiable hazards will be reduced in the home environment by 100% within one month.
- The patient will not suffer a fall or injury.
- The patient will identify risks associated with visual impairment.

Setting Priorities

Nursing interventions are prioritized to provide safe and efficient care. For example, the patient described in the concept

map (Figure 36-5) has several nursing diagnoses. The patient's mobility problem is an obvious priority because of its influence on skin integrity and the risk for falls. Plan individualized interventions based on the severity of risk factors and the patient's developmental stage, level of health, lifestyle, and culture (Box 36-6). Planning also involves understanding the patient's need to maintain independence within physical and cognitive capabilities. You and the patient collaborate to establish ways of maintaining the patient's active involvement within the home and health care environment. Educating the patient and family is also an important intervention to reduce safety risks over the long term.

Continuity of Care

Patients need to learn how to identify and select resources within their community that enhance safety (e.g., block parent homes, local police departments, and neighbours willing to check on a patient's well-being). Collaboration with the patient and family and other disciplines such as social work and

► BOX 36-5 NURSING CARE PLAN

Risk for Injury

Assessment

Mr. Key, a visiting nurse, is seeing Ms. Cohen, an 85-year-old woman, at her home. The patient has been recovering from a mild stroke affecting her left side. Ms. Cohen lives alone but receives regular assistance from her daughter and son, who both live within 16 km. Mr. Key's assessment includes a discussion of Ms. Cohen's health problem and how the stroke has affected her, as well as a pertinent physical examination.

Assessment Activities

Findings and Defining Characteristics

Ask Ms. Cohen how the stroke has affected her mobility.

She responds, "I bump into things, and I'm afraid I'm going to fall."

Conduct a home hazard assessment.

Cabinets in the kitchen are in disarray and full of breakable items that could fall out. Throw rugs are on floors; bathroom lighting is poor (40-W bulb); bathtub lacks safety strips and grab bars; and home is cluttered with furniture and small objects.

Observe Ms. Cohen's gait and posture.

Ms. Cohen has kyphosis and has a hesitant, uncoordinated gait. She frequently holds walls for support.

Assess Ms. Cohen's muscle strength.

The left arm and leg are weaker than the right.

Assess visual acuity with corrective lenses.

Ms. Cohen has trouble reading and seeing familiar objects at a distance while wearing current glasses.

Nursing Diagnosis: Risk for injury related to impaired mobility, decreased visual acuity, and physical environmental hazards.

Planning

Goals (Nursing Outcomes Classification)*

Expected Outcomes

Home will be free of hazards within 1 month.

Risk Control

Modifiable hazards in kitchen and hallway will be reduced in the home within 1 week. Revisions to bathroom will be completed in 1 month.

Patient and family will be knowledgeable of potential hazards for patient's age group within 1 week.

Knowledge: Personal Safety

Patient and her daughter will identify risks and the steps to avoid them in the home at the conclusion of a teaching session next week.

Patient will express greater sense of feeling safe from falls in 1 month.

Fall Prevention Behaviour

Patient will report improved vision with the aid of new eyeglasses.

Patient will be free of injury within 2 weeks.

Patient will be able to safely ambulate throughout the home and perform personal care activities within 2 weeks.

*Outcome classification labels from Moorhead, S., Johnson, M., Maas, M. L., & Swanson, E. (Eds.). (2008). *Nursing outcomes classification (NIC)* (4th ed.). St Louis, MO: Mosby.

BOX 36-5 NURSING CARE PLAN—cont'd

Interventions (Nursing Interventions Classification)[†]

Fall Prevention

Review findings from home hazard assessment with patient and her daughter.

Establish a list of priorities to modify. Have patient's son assist in installing bathroom safety devices.

Install lighting (75-W bulbs, nonglare) throughout the home. Have patient's son install blinds over kitchen windows.

Discuss with patient and daughter the normal changes of aging, effects of recent stroke, associated risks for injury, and how to reduce risks.

Encourage daughter to schedule patient's vision testing for new prescription within 2–4 weeks.

Refer patient to a physiotherapist to assess need for assistive devices for kyphosis, left-sided weakness, and gait.

Rationale

Fall risks for homebound older adults include visual disturbances, unsteady gait, and postural changes (Meiner & Lueckenotte, 2006). Evaluation of home hazards will highlight extrinsic factors that may lead to falls.

Modification of environment reduces fall risk (McCullagh, 2006).

With aging, the pupil loses the ability to adjust to light, causing sensitivity to glare. Glare can make it difficult to clearly see a walking path (Meiner & Lueckenotte, 2006).

Education regarding management of hazards can reduce fear of falling (Ebersole et al., 2008).

Improved visual acuity reduces incidence of falls (Edelman & Mandle, 2006).

Exercise often improves gait, balance, and flexibility. Modifying gait problems by increasing lower extremity strength reduces fall risk.

[†]Intervention classification labels from Bulechek, G. M., Butcher, H. K., & Dochterman, J. M. (Eds.). (2008). *Nursing interventions classification (NIC)* (5th ed.). St. Louis, MO: Mosby.

Evaluation

Nursing Actions

Patient Response and Finding

Achievement of Outcome

Ask patient and family to identify risks.

Ms. Cohen and her daughter are able to identify risks during a walk through the home and expressed a greater sense of safety as a result of changes made.

Ms. Cohen and her daughter are more knowledgeable of potential hazards.

Observe environment for elimination of hazards.

Throw rugs have been removed. Lighting has been increased to 75 W, except in the bathroom and bedroom.

Environmental hazards have been partially reduced.

Reassess Ms. Cohen's visual acuity.

Ms. Cohen has new glasses and says she can read better and see distant objects more clearly.

Ms. Cohen's vision has improved, enabling her to ambulate more safely.

Observe Ms. Cohen's gait and posture.

Ms. Cohen's gait remains hesitant and uncoordinated; she reports that her daughter has not had time to take her to the physiotherapist.

The outcome of safe ambulation has not been totally achieved; continue to encourage Ms. Cohen and daughter to go to physiotherapy appointment.

occupational and physiotherapy may become an important part of your plan of care. For example, a hospitalized patient may need to go to a rehabilitation facility to gain strength and endurance before being discharged home. Be sure that the patient and family understand the need for resources and are willing to make changes that will promote the patient's safety.

❖ Implementation

Nursing interventions are directed toward ensuring a patient's safety in all settings and include health promotion, developmental interventions, environmental interventions, and limiting specific risks to patient safety.

Health Promotion

To promote a patient's health, it is necessary for the individual to be in a safe environment and to practise a lifestyle that minimizes the risk of injury. Edelman and Mandle (2006) described passive and active strategies aimed at health promotion. Passive strategies are implemented through public health

and government legislative interventions (e.g., sanitation and clean water laws). Active strategies are those in which the individual is actively involved through changes in lifestyle (e.g., wearing a seat belt or installing outdoor lighting) and participation in wellness programs.

You can participate by supporting legislation and working in community-based settings. Because environmental and community values have the greatest influence on health promotion, community and home health nurses assess and recommend safety measures in the home (see Box 36-3), school, neighbourhood, and workplace.

Developmental Interventions

Accidents involving children are mostly preventable, and parents need to be aware of specific dangers at each stage of growth and development. Accident prevention thus requires health education for parents and the removal of dangers whenever possible. You are frequently in a position to educate parents about reducing the risks of injuries for young children (see Chapter 22). Nurses working in prenatal and postpartum

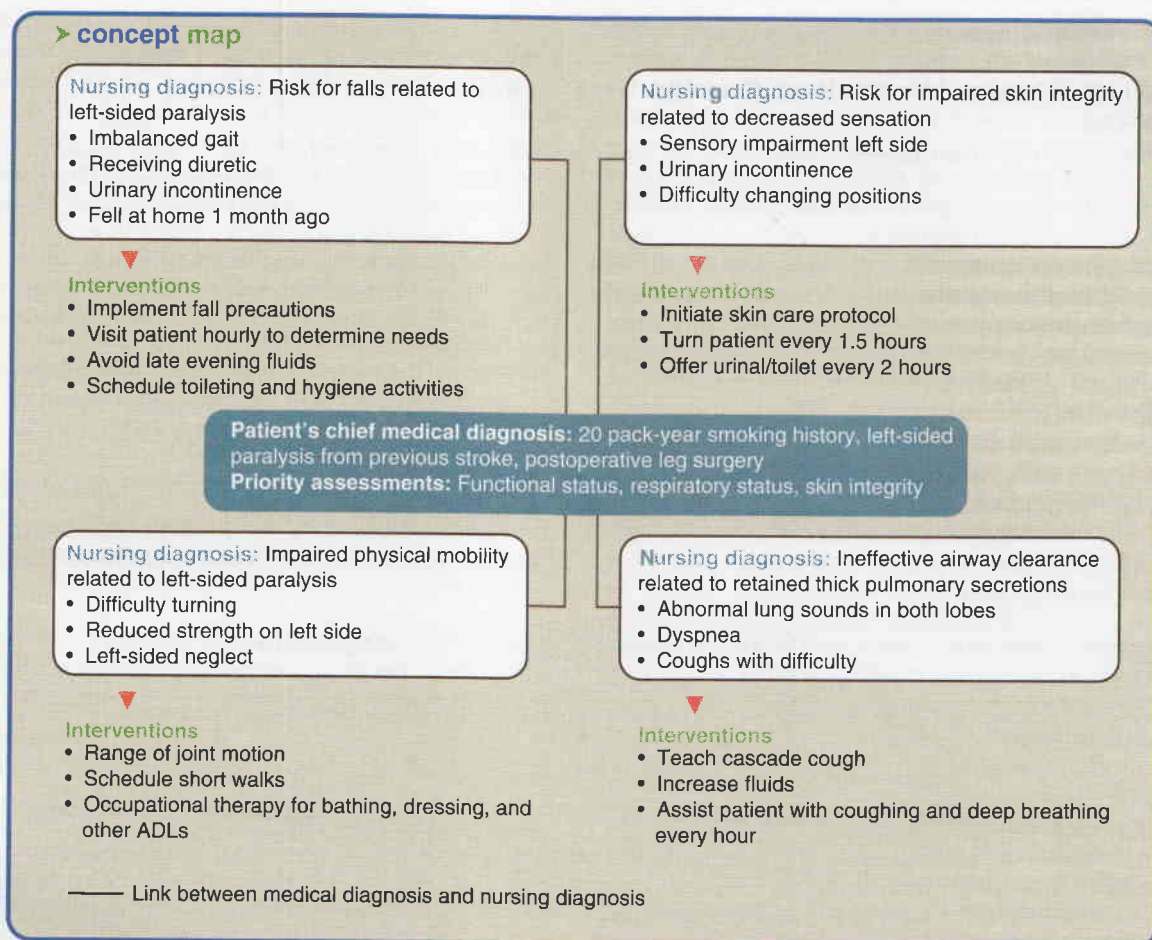


Figure 36-5 Concept map for a patient with a cerebrovascular accident three months previously with left-sided paralysis, two days after right femoral–popliteal bypass. ADLs, Activities of daily living.

* BOX 36-6 CULTURAL ASPECTS OF CARE

Cultural phenomena affecting health and safety include attitudes toward personal space, social organizations, communication, and environmental control. While conducting a home assessment for risks to safety, remember that you have entered the patient's territory and that the patient's attitude toward his or her residence and belongings must be appreciated. For example, patients from Western Europe and the British Isles may be considered aloof and distant with regard to personal space. It may be very difficult for them to have an outsider in their home who suggests changes regarding their personal belongings to reduce physical hazards. It is particularly difficult to determine a patient's attitude toward his or her home environment when the patient's primary language and that of the health care provider differ.

Another culturally sensitive issue involves the patient's sense of environmental control. Be aware of health beliefs and practices that will affect the outcome of interventions. For example, a reliance on family and religious organizations, as opposed to community resources, may affect the patient's compliance with nursing interventions and referrals.

Learn to ask questions sensitively and to show respect for different cultural beliefs. Adapting to different cultural beliefs and practices requires flexibility. Respect for the belief systems of others and the effects of those beliefs on the patient's well-being are critically important to competent health care. You must have the ability and knowledge to communicate about and to understand health behaviors influenced by culture.

Implications for Practice

- Resistance to change long-standing habits can interfere with a cultural group's acceptance of injury-prevention practices. Include family members who have a strong influence, such as a dominant man or older woman, when providing safety education.
- Evaluate the use of traditional ethnic remedies or foods that contain lead; these can increase a patient's risk for lead poisoning.
- Remember that living in rural areas and in manufactured housing places the patient at greater risk for fire-related injuries and death.
- Stress the importance of having fully functioning smoke detectors and a multipurpose fire extinguisher.
- Assess the patient's smoking and drinking habits. Residential fire deaths are often attributed to the use of cigarettes and alcohol.
- Patients who live in poverty and have low educational levels are at greater risk for injury and disease. Assist the patient and family in identifying community resources, such as the local health office or clinic.
- Be aware of family patterns and how the patient and family interact with each other. Family disruption and weak intergenerational ties can increase a patient's risk for injury from violent behaviour.



settings can incorporate safety into the care plan of the child-bearing family. Community health nurses can assess the home and show parents how to promote safety in their homes (see Table 36-2 and Figures 36-6 and 36-7). The following discussion highlights some specific risks at different developmental stages.

Infants, Toddlers, and Preschoolers. Small children must be protected from accidental poisoning. Strategies for prevention of the accidental ingestion of poisonous materials are outlined in Table 36-2. In any instance of accidental poisoning, guidelines for intervening (Box 36-7) should be adhered to. The poison control centre phone number should be visible

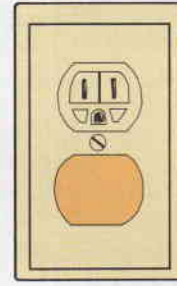


Figure 36-6 Safety covers for electrical outlets.

► TABLE 36-2 Interventions to Promote Safety for Children and Adolescents

Intervention

Infants and Toddlers

- Ensure that infants sleep on their backs. Teach parents the mnemonic “back to sleep.”
- Ensure that parents do not fill cribs with pillows, large stuffed toys, or comforters. Sheets should fit snugly.
- Ensure that pacifiers are not attached to a string or ribbon and placed around a child’s neck.
- Ensure that all instructions for preparing and storing formula are being followed.
- Ensure that only large, soft toys without small parts such as buttons are being used.
- Teach parents that playpens with mesh sides should not be left with a side down; spaces between crib slats should be <6 cm apart.
- Teach parents to never leave crib sides down or leave babies unattended on change tables or in infant seats, swings, strollers, or high chairs.
- Teach parents to discontinue using accessories such as infant seats and swings when the child becomes too active or physically too big.
- Teach parents to never leave a child alone in the bathroom, in the tub, or near any water source (e.g., a pool).
- Teach parents strategies to baby-proof the home:
 - Install safety locks on floor-level cabinets
 - Use child-resistant caps
 - Place small or sharp objects, medications, and cleaning agents out of children’s reach
 - Leave potentially poisonous materials in their original containers
 - Remove poisonous plants from the home
- Also ensure that parents are aware that poisoning can result from swallowing miniature button or disc batteries, commonly found in games, cameras, calculators, and watches.
- Teach parents to remove plastic bags from the cleaners or grocery store from the home.
- Ensure that electrical outlets are protected by covers (Figure 37-6).
- Ensure that window guards are on all windows.
- Ensure that keyless locks (e.g., deadbolts) have been installed on doors above a child’s reach (even when they are standing on a chair).

Rationale

- Sleeping on the back is associated with the lowest risk of sudden infant death syndrome (SIDS) (Canadian Pediatric Society, 2010a).
- Infants may become entwined in sheets and other bedding and suffocate (Canadian Pediatric Society, 2010a).
- Choking may occur.
- Proper formula preparation and storage prevents contamination.
 - A formula may come in a concentrated form, or it may already be diluted and ready to use. Following directions ensures the proper concentration of the formula. Undiluted formula can cause fluid and electrolyte disturbances; overly diluted formula does not provide sufficient nutrients.
- Small parts can become dislodged, and choking and aspiration are possible.
- A child’s head may become wedged in the lowered mesh side or between crib slats, and asphyxiation may occur.
- Infants and toddlers can roll or move and fall from change tables or out of accessories such as infant seats or swings.
- When physically active or too big, the child can fall out of or tip over these accessories and suffer an injury.
- Accidental drowning may occur.
- Babies explore their world with their hands and mouth.
 - Choking and poisoning may occur.
- Suffocation may occur if plastic covers the nose and mouth.
- Crawling babies may insert objects into outlets and experience an electrical shock.
- Guards prevent children from falling out of windows.
- Keyless locks prevent a toddler from leaving the house and wandering off. Death from exposure, car accidents, and drowning may occur if a toddler wanders away. Keyless locks allow for rapid exit in the case of fire.

Continued

► **TABLE 36-2 Interventions to Promote Safety for Children and Adolescents—cont'd**

Intervention	Rationale
Teach parents that children weighing <36 kg must always be in an age- and weight-appropriate car seat that has been installed according to the manufacturer's instructions (Figure 37-7). This includes car seats and booster seats. Children under 13 years should be in the back seat of the car. All passengers should wear their seat belts (Canadian Pediatric Society, 2011). Encourage caregivers to learn cardiopulmonary resuscitation and the Heimlich manoeuvre.	In case of a sudden stop or crash, an unrestrained child may suffer severe head injuries and death. Caregivers should be prepared to intervene in acute emergencies, such as choking.
Preschoolers	
Encourage parents to teach children to swim at an early age, but always provide supervision near water. Encourage parents to teach children how to cross streets and walk in parking lots. Instruct them to never run out into the street after a ball or toy. Encourage parents to teach children not to talk to, go with, or accept any item from a stranger. Children should also be taught not to go with a known adult unless they have their parent's permission (Child Find Canada, 2006). Encourage parents to teach children basic physical safety rules, such as the proper use of safety scissors, never running with an object in their mouth or hand, and never attempting to use the stove or oven unassisted. Encourage parents to teach children not to eat items found in the street or grass. Teach parents to remove doors from unused refrigerators and freezers and to instruct children not to play or hide in a car trunk or unused appliances.	Swimming is a useful skill that may someday save a child's life. However, all children need constant supervision near water. Pedestrian accidents involving young children are common. This precaution reduces the risk of exploitation and abduction. The risk of injury is lower if children are taught basic safety procedures. Poisoning may occur. If a child cannot freely exit from an appliance or car trunks, asphyxiation may occur.
School-Aged Children	
Encourage parents to teach children the safe use of equipment for play and work. Encourage parents to teach children proper bicycle safety, including the use of a helmet and rules of the road. Encourage parents to teach children proper techniques for specific sports, as well as the need to wear proper safety gear (e.g., eyewear or mouth guards). Encourage parents to teach children not to operate electrical equipment while unsupervised. Teach parents that children should never have access to firearms or other weapons. All firearms should be kept in locked cabinets. Encourage parents to teach children safe use of the Internet.	Children need to learn the safe, appropriate use of implements to avoid injury. These safety precautions may reduce injuries from falling off a bike or being hit by a car. The use of proper sports techniques, the correct equipment, and protective gear prevents injuries. If an electrical mishap were to occur, no one would be available to help. Children are often fascinated by firearms and weapons and may attempt to play with them. Children are vulnerable to being exploited by predators over the Internet.
Adolescents	
Encourage enrollment in driver's education classes. Provide information about the effects of using alcohol, drugs, or other substances (e.g., glue, aerosols, or gasoline). Provide sex education, including safer sex practices, birth control, and abstinence. Refer adolescents to community and school-sponsored activities. Encourage mentoring relationships between adults and adolescents. Teach adolescents the safe use of the Internet.	Many injuries in this age group are related to motor vehicle accidents. Adolescents are prone to risk-taking behaviours and are subject to peer pressure. Many adolescents begin sexual relationships. Pregnancy and sexually transmitted infections may result. Adolescents need to socialize with peers yet need some supervision. Adolescents are in need of role models after whom they can pattern their behaviour. Safe use of the Internet avoids overuse and possible exposure to inappropriate Web sites.

Adapted from Hockenberry, M., & Wilson, D. (2007). *Wong's nursing care of infants and children* (8th ed.). St Louis, MO: Mosby.

► BOX 36-7 Procedural Guideline

Interventions for Accidental Poisoning

Teach parents to call 911 or emergency services immediately if their child is unconscious, not breathing, or having convulsions or seizures due to poison contact or ingestion. If they think that their child has come in contact with poison and has mild or no symptoms, they should call their local poison control centre. Phone numbers for poison control centres across Canada can be accessed at <http://www.aboutkidshealth.ca/En/HealthAZ/TestsAndTreatments/Resources/Pages/Poison-Information-Centres-in-Canada.aspx> (AboutKidsHealth.ca, 2011).

Different types and methods of poisoning require different, immediate treatment:

- Swallowed poison—Remove the item from the child, and have the child spit out any remaining substance. Do not make your child vomit. Do not use syrup of ipecac.
- Skin poison—Remove the child's clothes and rinse the skin with lukewarm water for at least 15 minutes.
- Eye poison—Flush the child's eye by holding the eyelid open and pouring a steady stream of room-temperature water into the inner corner.
- Poisonous fumes—Take the child outside or into fresh air immediately. If the child has stopped breathing, start cardiopulmonary resuscitation (CPR) and do not stop until the child breathes on his or her own, or until someone can take over (American Academy of Pediatrics/Healthy Children.org, 2009).

School-Aged Children. School-aged children increasingly explore their environment (see Chapter 22). They may travel to and from school on foot or by school bus, and they may have friends outside their immediate neighbourhood. They may also become more active in extracurricular activities. Parents, teachers, and nurses must instruct children in safe practices to follow at school and play. Table 36-2 lists nursing interventions to help guide parents in providing for the safety of school-aged children. Using examples when discussing safe practices is an effective way to teach school-aged children.

Because school-aged children participate in more activities outside their home and neighbourhood environments, they are at greater risk of injury from strangers. Children should be warned repeatedly not to accept candy, food, gifts, or rides from strangers, and not to go anywhere with a known adult unless they have their parent's permission. In addition, children need to know what to do if a stranger approaches. Frequently, neighbourhoods have a "block parent" program. The owner of a block parent home ensures that an adult is home during the times when children are walking to and from school. If a stranger approaches a child, the child can run to that home (identified by a sign), and the adult will protect the child and call the proper authorities. You may work with school systems or neighbourhoods to initiate such a system to protect children.

Sports safety is stressed in school sports, but parents and health care providers can reinforce these safety tips by insisting that children wear protective gear while participating in sports such as skateboarding and snowboarding. For example, schools provide hard batting helmets for baseball games, and parents should also provide this equipment when children are playing baseball in their own backyards.

Bicycle- and scooter-related injuries are a major cause of death and disability among children. Bikes should be in good

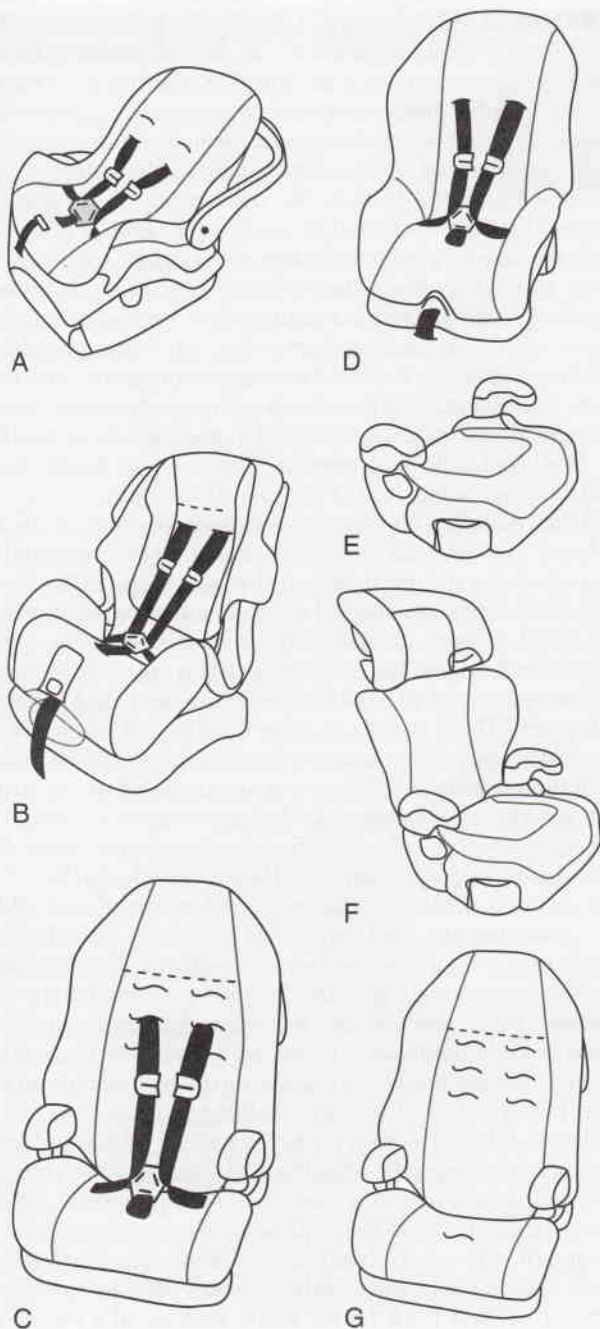


Figure 36-7 Infant car seat. A, Infant seat with base. B, "3-in-1" convertible seat—infant/child/booster seat. C, Infant/child/booster seat. D, Child/booster seat. E, Backless booster seat. F, High-back booster seat. G, Combination (child/booster) seatbelt-positioning booster seat mode. **Source:** Canadian Pediatric Society. (2011). *Keeping kids safe*. Retrieved from <http://www.caringforkids.cps.ca/keepkidssafe/CarSeatSafety.htm>.

on the telephone in homes with young children, and the centre should be called immediately if poisoning is suspected.

Educate parents that children under five years of age are also more susceptible to infectious diseases. The recommended vaccination schedule begins in infancy and protects children from potentially life-threatening illnesses such as whooping cough, measles, mumps, chickenpox, and meningitis (Canadian Pediatric Society, 2010b).



Figure 36-8 Proper bicycle safety equipment for school-aged children.

working order and the proper size for the child. Children under the age of 10 years should not be permitted to ride their bike on the road, as they have not yet developed the combined physical and cognitive skills to do this safely (Safe Kids Canada, 2010). They should also be cautioned not to engage in dangerous stunts or activities while bike riding. A properly fitted helmet should be worn, as it can decrease the risk of head injury by up to 85% (Safe Kids Canada, 2010). Because most fatalities from bicycle accidents are related to head injuries, most provinces have implemented laws requiring that children wear bicycle helmets while cycling (Figure 36-8).

Adolescents. Risks to the safety of adolescents involve many factors outside the home environment, particularly their almost constant involvement with their peers (see Chapter 22). Adults serve as role models for adolescents and, through providing examples, setting expectations, and providing education, can help adolescents minimize risks to their safety. For example, adolescents who are considering getting a body piercing or tattoo need information about the risks for complications with these procedures and strategies for minimizing these risks. This age group has a high incidence of suicide because of feelings of decreased self-worth and hopelessness. You should be aware of the risks posed at this time and be prepared to teach adolescents and their parents measures to prevent accidents and injury (see Table 36-2).

When adolescents learn to drive, their environment expands and so does their risk for injury. The potential for motor vehicle accidents is higher among teen drivers than in any other age group. Teens are more likely to speed, run red lights, and drive while intoxicated. The young driver must be taught to comply with rules and regulations when using a car.

safety alert Reinforce to new drivers and their parents the need to consistently wear safety belts and to never ride in a car with a driver who may be intoxicated. Assist parents and their teen in developing a plan of action to be used if the teen finds himself or herself with a driver who has been drinking or has used other substances.

Because adolescence is a time when mature sexual physical characteristics develop, adolescents may begin to have physical relationships with others. They need prompt, accurate instruction to prevent pregnancy and the spread of sexually transmitted disease (see Chapter 26).

Adults. Risks to young and middle-aged adults frequently result from lifestyle factors such as postpartum depression, high stress levels, inadequate nutrition, the use of firearms, excessive alcohol intake, and substance abuse (see Chapter 23). In our fast-paced society, there appears to be more expression of anger, which can quickly precipitate accidents (e.g., “road rage”). Adults need to have the opportunity to discuss the choices they have made in their life and the types of threats to safety that exist. Given information about threats to their well-being, adults may make the necessary modifications to their lifestyle practices. Useful resources are stress-management centres, employee-assistance programs, and health-promotion activities, which can be found in many communities and hospitals. In addition, neighbourhood centres, community clinics, and outpatient clinics are equipped to assist adults in modifying lifestyle habits that present risks to their health (e.g., smoking, overeating, lack of exercise, alcoholism).

Older Adults. Nursing interventions for older adults are designed to reduce the risk of falls and other accidents and to compensate for the physiological changes of aging (Box 36-8).

In older adults, diminished eyesight and impaired memory may result in an accidental overdose or missed doses of prescribed medications. The use of medication organizers that are filled once a week by the patient or family can help to prevent such errors. These organizers have the day and time on each box so that the patient knows when and what to take at any given time (Figure 36-9). They can be purchased at any drugstore at a very reasonable cost. Medication not in use or out of date should be taken to a pharmacy or municipal waste disposal depot for proper disposal (Health Canada, 2011).

Burns and scalds are also more apt to occur with older individuals because they may become confused when turning the dials on a stove or other heating appliance. Nursing measures for preventing burns are designed to minimize the risk presented by impaired vision. Hot water faucets and dials can be colour coded to make it easier for the adult to know what has been turned on. Lowering the thermostat setting on the water heater reduces the risk of scalding.

Older adults are more likely to have motor vehicle accidents because of three specific physiological changes. First, changes in visual acuity, depth perception, and peripheral vision prevent these patients from quickly observing situations in which an accident is likely to occur. Second, decreased hearing acuity alters older adults’ ability to hear emergency vehicle sirens or car and truck horns. Third, because of a decreased nervous system response, older adults may be unable to react as quickly as they once could to avoid an accident. A decline in these skills may account for the most common types of accidents, including right-of-way and turning accidents. Educate patients regarding safe driving (e.g., driving shorter distances or only in daylight, using side- and rear-view mirrors carefully, and looking back toward their “blind spot” before changing lanes). If hearing is a problem, patients might try keeping a window rolled down while driving or reducing the volume of the radio or music.

Eventually, counselling may be necessary to help a patient make the decision of when to stop driving. This is not an easy decision as it can have implications for the patient’s self-concept and self-esteem. It also has practical implications—the individual who has been accustomed to driving to daily activities will have to find alternative transportation. As a result, the patient may resist giving up his or her driver’s licence and vehicle. You can support the decision to stop driving by

BOX 36-8 FOCUS ON OLDER ADULTS

- Older adults experience alterations in vision and hearing. Encourage yearly vision and hearing examinations and frequent cleaning of glasses and hearing aids as a means of preventing falls and burns.
- Older adults may have slower reaction times. Teach patients safety tips for avoiding motor vehicle accidents. Driving may need to be restricted to daylight hours or suspended altogether.
- Range of motion, flexibility, and strength are decreased. Encourage supervised exercise classes for older adults and teach them to seek assistance with household tasks as needed. Assess whether safety features, such as grab bars in the bathroom, are needed.
- Reflexes are slowed, and the ability to respond to multiple stimuli is reduced. Provide adequate, meaningful stimuli but prevent sensory overload.
- Nocturia and incontinence are more frequent in older adults. Institute a regular toileting schedule for the patient. A recommended frequency is every three hours. Diuretics are generally given in the morning; however, you should speak with your patient about his or her response to the drug to determine the best timing. Assistance should be provided, along with adequate lighting, to patients who need to use the bathroom at night.
- The family plays a significant role in the care of older adults. Often, family members serve as informal caregivers for older adults. In Canada in 2006, 30% of women and 22% of men between the ages of 45 and 54 provided informal care to an older adult (Vanier Institute of the Family, 2010). Encourage the family to allow the older adult to remain as independent as possible and to provide help for only those things that are necessary.
- The high prevalence of chronic conditions in older adults results in the use of a high number of prescription and over-the-counter medications. Coupled with age-related changes in pharmacokinetics, this presents a greater risk of serious adverse effects. Medications typically prescribed for older adults include anticholinergics, diuretics, anxiolytic and hypnotic agents, antidepressants, antihypertensives, vasodilators, analgesics, and laxatives, all of which may themselves pose risks or interact with other medications to increase the risk for falls. Review the patient's drug profile to ensure that any of the above noted drugs are used cautiously, and assess the patient regularly for any adverse effects that may increase the risk for falls.



offering anticipatory guidance when an illness with progressive impairment is diagnosed, working with family members to determine how to approach the issue with the patient, and providing information about objective assessment of driver ability (DriveABLE, 2010). When your patients make this decision, help them locate resources in the community that provide transportation.

Pedestrian accidents can be reduced by persuading individuals to wear reflectors on garments when walking at night; to stand on the sidewalk and not in the street when waiting to cross; to always cross at corners and not in the middle of the block (particularly on a major street); to cross with the traffic light and not against it; and to look left, right, and left again before entering the street or crosswalk.

Environmental Interventions

You can implement specific interventions aimed at maintaining a safe environment. Particularly important are measures for preventing fires and dealing with them if they do occur. Other environmental interventions are those that address basic needs, physical hazards, and the transmission of pathogens.

Fires. A fire is always possible in the home or health care facility. Accidental home fires typically result from smoking in bed, placing cigarettes in trash cans, cooking accidents, or faulty wiring or appliances. Institutional fires typically result from electrical or anaesthetic-related causes. Although smoking is usually not allowed in the health care setting, smoking-related fires continue to pose a significant risk as a result of unauthorized smoking in bed.

The interventions described here are directed toward fires occurring in health care agencies, but the same principles apply for fires in the home (Box 36-9). Smoke detectors (Figure 36-10) should be placed strategically throughout the home and checked regularly. Multipurpose fire extinguishers should be installed near the kitchen and any workshop areas.

In the home, it is important to have a plan of action in the event of fire, including a route of exit, a location where family members will meet, and the identification of who will help individuals in need of assistance. A fire drill should be held to practise this plan once or twice each year. Although having an escape plan is necessary for all families, it is particularly important for families with disabled individuals. All patients, even young children, should be familiar with the phrase “stop,

BOX 36-9

Fire Intervention Guidelines for Nurses Working in Health Care Agencies

- Ensure that the phone number for reporting fires appears on the telephone and is visible at all times.
- Know your agency's mnemonic (if any), fire drill, and evacuation plan.
- Know the location of all fire alarms, exits, extinguishers, and the oxygen shut-off.
- Use the mnemonic RACE to set priorities in case of fire:
Rescue and remove all patients in immediate danger.
Activate the alarm. Always do this before attempting to extinguish even a minor fire.
Confine the fire by closing doors and windows and turning off oxygen and electrical equipment.
Extinguish the fire using an extinguisher (see Box 36-10).



Figure 36-9 The One-Day-At-A-Time medicine organizer. **Source:** Courtesy Apothecary Products, Inc. Burnsville, MN.

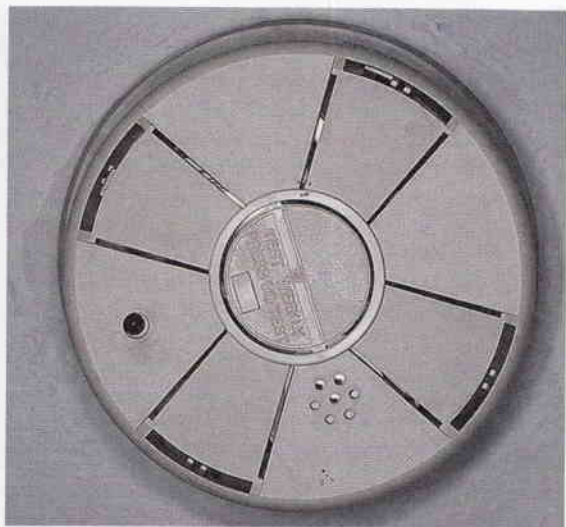


Figure 36-10 Smoke and fire detector.

drop, and roll,” which describes the actions to be followed when a patient’s clothing or skin are burning.

If a fire occurs in a health care agency, you protect patients from immediate injury, report the exact location of the fire, and contain the fire and extinguish it if possible. All personnel are mobilized to evacuate patients. Patients who are close to the fire, regardless of its size, are at risk of injury and should be moved to another area. If a patient is receiving oxygen but not life support, discontinue the oxygen because it supports combustion and can fuel an existing fire. If the patient is on life support, you may need to maintain the patient’s respiratory status manually with an Ambu-bag (see Chapter 38) until the patient is moved away from the fire and the ventilator can be restarted. Ambulatory patients can be directed to walk by themselves to a safe area and, in some cases, may be able to assist in moving patients in wheelchairs. Bedridden patients are generally moved from the scene of a fire on a stretcher, in their bed, or in a wheelchair. If none of these methods is appropriate, patients must be carried from the area. If a patient must be carried, be careful not to overextend your physical limits for lifting because an injury to you can result in further injury to the patient. If fire department personnel are on the scene, they can help evacuate patients.

After a fire has been reported and patients are out of danger, nurses and other personnel must take measures to contain or put out the fire, such as closing doors and windows, placing wet towels along the base of doors, turning off oxygen and electrical equipment, and using a fire extinguisher. Fire extinguishers commonly seen in the clinical setting are categorized as type A, used for ordinary combustibles (e.g., wood, cloth, paper, and many plastic items); type B, used for flammable liquids (e.g., gasoline, grease, paint, and anaesthetic gas); and type C, used for electrical equipment. Extinguishers labelled ABC Multipurpose can be used for any of the above types of fire. The correct use of an extinguisher is discussed in Box 36-10 and demonstrated in Figure 36-11.

The best intervention is to prevent fires. Nursing measures include complying with your agency’s smoking policies and keeping combustible materials away from heat sources. Some agencies have fire doors that are held open by magnets and

BOX 36-10 PATIENT TEACHING

Correct Use of a Fire Extinguisher in the Home

Objectives

- Patient will correctly place the extinguisher in the home.
- Patient will describe when it is appropriate to use a home fire extinguisher.
- Patient will demonstrate the correct technique when using a fire extinguisher.
- Patient will state when fire extinguishers need to be replaced.

Teaching Strategies

- Discuss correct location of the fire extinguisher. It is recommended that one be placed on each level of the home, near an exit, in clear view, away from stoves and heating appliances, and above the reach of small children. Keep a fire extinguisher in the kitchen, laundry room, workshop, and garage. The instructions should be read when the extinguisher is purchased and kept available for periodic review.
- Describe the steps to take before using the extinguisher. The patient should attempt to fight the fire only after all occupants have left the home, the fire department has been called, the fire is confined to a small area, an exit route is readily available, the extinguisher is the right type for the fire (see the text for a description of extinguisher types), and the patient knows how to use the extinguisher.
- Instruct the patient to memorize the mnemonic PASS: **P**ull the pin to unlock handle; **A**im low at the base of the fire; **S**queeze the handle; and **S**weep the unit from side to side (see Figure 36-11).

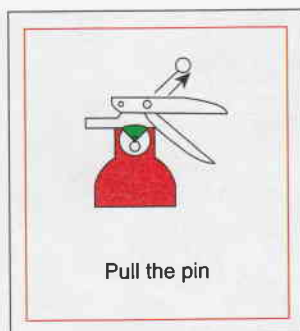
Evaluation

- Observe the patient correctly installing an extinguisher in the home.
- Ask the patient to correctly list the steps to take before attempting to use an extinguisher.
- Ask the patient to demonstrate the correct use of the extinguisher while reciting the instructions with the mnemonic PASS.

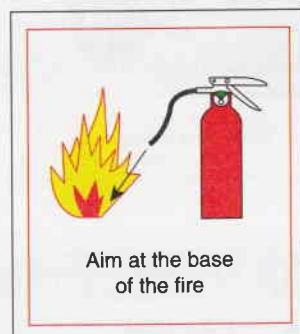
Source: Adapted from Windsor Fire & Rescue Services. (2011). *Home fire extinguisher guidelines*. Windsor, ON: Author. Retrieved from <http://www.windsorfire.com/divisions-prevention-home-fire-extinguisher-guidelines>.

close automatically when a fire alarm sounds. It is important to keep equipment away from these doors.

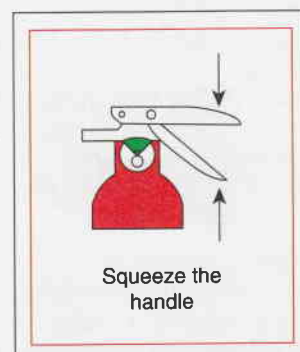
Other Environmental Interventions. You can contribute to a safer environment by helping your patients meet basic needs related to oxygen, humidity, nutrition, and temperature. To ensure that oxygen availability is not threatened, recommend that patients living at home have annual inspections of the heating system, chimney, and appliances. Carbon monoxide detectors are available for home use at a reasonable cost but should not be considered a replacement for the proper use and maintenance of fuel-burning appliances. To achieve a comfortable level of humidity in the home, patients can attach a humidifier to the furnace or, in the case of patients who have upper respiratory tract infections, use a room humidifier where they sleep. Teach basic techniques for food handling (e.g., handwashing and checking for spoilage) and preparation (e.g., keeping food refrigerated before serving) so that nutritional



Pull the pin. Some models require you to remove a locking pin on the handle or lever. Some models may have other lever-releasing mechanisms, such as a button.



Aim low and direct the hose nozzle or cone at the base of the fire. If you aim at the flames, which most inexperienced users are tempted to do, the extinguishing agent will flow right through the flames, and be ineffective. You want the extinguishing agent to hit the base of the fire. Follow the manufacturer's instructions on the safe distance from which to fight the fire. Most portable fire extinguishers must be used from a distance of 1.8 to 3 metres (6 to 10 feet) to be effective.



Squeeze the lever above the handle to discharge the extinguishing agent. Releasing the lever will stop the discharge. Some models may have a button instead of a lever.



Sweep the nozzle or hose from side to side at the base of the fire. Moving carefully toward the fire, keep the extinguisher aimed at the base of the fire and sweep back and forth until the flames appear to be out. Never turn your back on a fire; watch the fire area in case the fire re-ignites, and repeat use of the extinguisher if necessary.

Figure 36-11 The correct use of a fire extinguisher. **Source:** Windsor Fire.com (2011). *Home fire extinguisher guidelines*. Retrieved from <http://www.windsorfire.com/divisions-prevention-home-fire-extinguisher-guidelines>.

needs are met safely. It is also helpful for family members to date leftovers. Older adults who have difficulty preparing their own food may benefit from Meals on Wheels, an organization that provides fresh, nutritious meals in the home. Patient education for older adults and patients who enjoy outdoor activities should include ways to prevent and treat frostbite, hypothermia, heatstroke, and heat exhaustion (see Chapter 30).

Adequate lighting and security measures in and around the home, including the use of night lights, exterior lighting, and good-quality locks on windows and doors, enable patients to

reduce the risk of injury from crime. Local police departments and community organizations often have safety classes available to teach residents how to take precautions to minimize the chance of becoming involved in a crime. Some useful tips include always parking the car near a bright light or in a busy public area, carrying a whistle attached to the car keys, keeping car doors locked while driving, and always paying attention while driving to notice if anyone starts to follow the car. Patients should be encouraged to join block associations and work closely with law enforcement personnel to reduce crime in their neighbourhoods.

To prevent the transmission of pathogens, teach aseptic practices. Patients and family members need to learn thorough hand hygiene (handwashing or the use of hand rub) and when to use it (e.g., before and after caring for a family member, before food preparation, before preparing a medication for a family member, and after contacting any body fluids). When patients require dressing changes or the use of syringes and needles, families should be shown how to properly dispose of contaminated items in the home. Most communities have regulations for the disposal of biohazardous waste.

Limiting Specific Risks to Patient Safety

A number of specific safety measures are applicable to patients in the home or health care agency. Take actions to help patients avoid injuries related to falls, the use of restraints and side rails, electrical hazards, and radiation. Special precautions are necessary to prevent injury in patients susceptible to having seizures.

Falls. Easy modifications in the home and health care environment can reduce the risk of falls (Table 36-3). A heavy or debilitated patient in a bed or wheelchair or on a toilet should be properly supported and secured. Side rails may be necessary. Safety bars near toilets, locks on beds and wheelchairs, and call lights are additional safety features found in health care settings (Figures 36-12 and 36-13). Excess furniture and equipment should be removed. Weakened patients should wear rubber-soled shoes or slippers when walking or transferring. For patients who use assistive aids such as canes, crutches, or walkers, it is important to routinely check the condition of rubber tips and the integrity of the aid.

In the health care setting, injuries may occur when patients attempt to address self-care needs independently despite encouragement to call for assistance. One way to minimize the occurrence of such incidents is to check in on patients frequently during the day. A formal routine of nursing rounds, during which nurses visit patients every hour and provide necessary assistance, has been found to decrease the incidence of falls and increase patient satisfaction (Box 36-11).



Figure 36-12 Safety bars beside a toilet and shower.



Figure 36-13 Safety locks on a wheelchair.

BOX 36-11 RESEARCH HIGHLIGHT

Effects of Nursing Rounds

Research Focus

Hospitalized patients often require assistance with basic activities of daily living such as eating, toileting, and ambulating. Patients usually communicate their needs by use of a call light. Not meeting a patient's needs in a timely fashion decreases patient satisfaction and places him or her at greater risk for injury. You play a key role in the prevention of falls and injuries related to falls.

Research Abstract

Meade and colleagues (2006) wanted to know if making nursing rounds every one or two hours would reduce call light usage, increase patient satisfaction, and reduce the frequency of patient falls. During rounds, the following actions were performed for each patient: pain management, toileting, positioning, and placing items such as the call light, telephone, television remote, bed light switch, tissues, and water within reach and the garbage can next to bed. In addition, before leaving the room, the nurse asked, "Is there anything else I can do for you before I leave? I have time while I'm here in the room." The patient was also told that a staff member would be back in one (or two) hours.

A six-week quasi-experimental study was conducted on 27 nursing units in 14 hospitals. Researchers took baseline data on call light usage during the initial two weeks. Performing rounds at set intervals, including specific nursing actions, was associated with statistically significant reduced patient call light usage, increased patient satisfaction, and, in the group receiving rounds hourly, decreased patient falls.

Evidence-Informed Practice

- Nursing rounds performed at set intervals positively affect patient satisfaction and safety and lead to fewer distractions for the staff.
- Nurses' ability to meet patients' needs affects patients' perception of the quality of nursing care.
- Nurses can anticipate patient needs by performing rounds, including specific nursing actions, at one-hour intervals.

Reference: Meade, C. M., Bursell, A. L., & Ketelsen, L. (2006). Effects of nursing rounds on patients' call light use, satisfaction, and safety. *American Journal of Nursing*, 106(9), 58–70.

► **TABLE 36-3** Measures to Prevent Falls by Older Adults

Measure

Stairs

Install treads with a uniform depth of 22.5 cm and 22.5 cm risers (vertical face of steps).

Install uniform-textured or plain-coloured surfaces on each tread, and mark the edges of treads with a contrasting colour.

Ensure proper lighting of each tread. Block glare from the sun or a light bulb with translucent shades or a screen, or use lower-wattage or nonglare bulbs.

Ensure adequate headroom so that patients do not have to duck to negotiate stairs.

Remove protruding objects from staircase walls.

Maintain outdoor walkways and stairs in good condition and free of holes, cracks, and splinters.

Rationale

If stairs are of uniform size, older adults do not need to continually adjust their vision.

Uniform textures or colour help to decrease vertigo. Marking the edges of treads provides obvious visual cues to end of stairs.

Older adults' vision is unable to adjust quickly to changes in lighting.

Sudden changes in head position may result in dizziness.

Decreased peripheral vision may prevent the patient from seeing an object.

Decreased visual acuity can prevent the patient from seeing any structural defect.

Handrails

Install a smooth but slip-resistant handrail at least 5 cm from wall.

Secure the handrail firmly so that the patient's weight is supported, especially at bottom and top of stairway.

Install grab rails in bathroom near the toilet and tub.

Install an elevated toilet seat with armrests and nonslip strips.

A 5 cm distance allows the patient to grasp the handrail firmly for support.

Older adults have the greatest risk of falling at top and bottom of stairs because their centre of gravity is being shifted and balance is unstable.

These measures enable the patient to have support while rising from a sitting to standing position.

Floors

Ensure that patients wear properly fitting shoes or slippers with a nonskid surface.

Secure all carpeting, mats, and tiles; place nonskid backing under small rugs.

Place bath mats or nonskid, coloured strips on bathtub or shower stall floors and on the floor in front of the toilet.

Secure electrical cords against the baseboards.

Maintain proper illumination inside and outside where the patient moves and walks.

Such footwear reduces the chances of slipping.

A sudden slip may cause dizziness and an inability to regain balance.

Wet surfaces increase the risk of falling.

This measure prevents tripping.

This measure reduces the risk of falling due to eye strain.

Health Care Facility Orientation

Place disoriented patients in a room near the nurses' station.

Supervise confused patients closely.

Show the patient how to use the call light at the bedside and in the bathroom, and place it within easy reach.

Place bedside tables and overbed tables close to the patient.

Remove clutter from bedside tables, hallways, bathrooms, and grooming areas.

Leave one side rail up and one down on the side where the oriented and ambulatory patient gets out of bed.

Proximity provides for more frequent observation by nursing staff.

Confused patients often attempt to wander out of bed or the room. The location and use of the call light are essential to patient safety.

This measure prevents the patient from searching or overreaching for items such as eyeglasses, dentures, a hearing aid, or the telephone.

This measure eliminates potential hazards and promotes patient independence.

The patient can use the side rail for support when getting in and out of bed and to position self once in bed.

Transport

Lock beds and wheelchairs when transferring a patient from a bed to a wheelchair or back to bed.

Place side rails in the up position and secure safety straps around the patient when transporting him or her by stretcher.

The locks provide stability and support during transfer.

This measure prevents the patient from rolling off the stretcher.

Adapted from Chang, J. T., Morton, S. C., Rubenstein, L. Z., Mojica, W. A., Maglione, M., Suttrop, M. J., Roth, E. A., & Shekelleet, P. J. (2004). Interventions for the prevention of falls in older adults: Systematic review with meta-analysis of randomized clinical trials. *British Medical Journal*, 328, 680.

The risk of injury in the home may be reduced by removing all obstacles from halls and other heavily travelled areas. Necessary objects such as clocks, glasses, tissues, and medications should remain on bedside tables within reach of the patient but out of the reach of children. Care should also be taken to ensure that end tables are secure and have stable, straight legs. Nonessential items should be placed in drawers to eliminate clutter. If small area rugs are used, they should be secured with a nonslip pad or skid-resistant adhesive strips. Carpeting on the stairs should be secured with carpet tacks.

Restraints. A restraint is a physical, chemical, or environmental means of controlling an individual's behaviour or actions (College of Nurses of Ontario, 2009b). The use of restraints is controversial as they have been associated with negative consequences including injury and death. Familiarize yourself with the legal aspects of restraint use. You must also follow guidelines and standards provided by your provincial nursing governing body as well as policies and procedures set by your clinical practice setting. A least-restraint approach is recommended to ensure highest-quality care. This approach ensures that all alternative interventions are attempted before moving to the use of restraints, and that the form of restraint selected is the one that addresses a patient's needs in the least restrictive way (College of Nurses of Ontario, 2009b).

It is imperative that you try alternative measures (Box 36-12) as the application of a restraint should always be a measure of last resort. The use of restraints must be guided by a patient's needs and requires a thorough assessment by you and other

► BOX 36-12 Alternatives to Restraints

- Orient patients and families to their environment; explain all procedures and treatments.
- Provide companionship and supervision; use trained sitters or adjust staffing.
- Offer diversionary activities, such as listening to music or having something to hold; enlist support and input from the family.
- Assign confused or disoriented patients to rooms near the nurses' station; observe these patients frequently.
- Use calm, simple statements and physical cues as needed.
- Use de-escalation, time-outs, and other verbal intervention techniques when managing aggressive behaviours.
- Provide appropriate visual and auditory stimuli (e.g., family pictures, a clock, or a radio).
- Remove cues that promote leaving (e.g., sight of elevators, stairs, or street clothes).
- Promote relaxation techniques and normal sleep patterns.
- Institute exercise and ambulation schedules as allowed by patients' conditions; consult a physiotherapist for mobility and exercise programs.
- Attend to the patient's toileting, food, and fluid needs.
- Camouflage IV lines with clothing, a stockinette, or a Kling dressing.
- Evaluate all medications the patients are receiving, and ensure effective pain management.
- Reassess the physical status of patients, and review laboratory findings connected with their health.

Source: Adapted from Joint Commission Resources. (2006). *Strategies for avoiding restraint related errors*. Retrieved from <http://www.jcrrc.com>; and American Nurses Association. (2006). Geriatric nursing resources for care of older adults. *Physical restraints*. Retrieved from <http://www.geronurseonline.org/index>

members of the multidisciplinary team involved in the patient's care. A restraint-use algorithm provides evidence-informed guidelines for determining whether a restraint is appropriate and what interventions might be used (Figure 36-14).

The use of any type of restraint involves a psychological adjustment for the patient and family. If restraints must be used, assist family members and the patient by explaining the purpose of the restraints, the patient's expected care while restrained, the precautions to be taken to avoid injury, and the temporary and protective aspects of restraints. Informed consent from family members may also be required before using restraints. The nursing story in Box 36-13 demonstrates family involvement in a decision about restraint.

A **physical restraint** immobilizes a patient or a patient's extremity (College of Nurses of Ontario, 2009b). The optimal goal with all patients is to avoid the use of physical restraints, and alternatives must always be considered. However, patients

BOX 36-13 NURSING STORY

David's Mittens

Katherine has been caring for David, a six-month-old boy who has been hospitalized for several weeks. David has a complex health problem and is currently experiencing severely dry, itchy skin associated with his illness. Katherine has noticed that anti-itch medications decrease David's discomfort but do not eliminate the itch entirely. As a result, he continues to scratch, and even with regularly trimmed nails, he has scratched himself hard enough to cause bleeding. David's mother plays with him to distract him from the itch, and when he tries to scratch, she gently holds his hands. However, she cannot be with David at all times in the hospital. Another concern is that David scratches his skin while sleeping.

Katherine discusses the situation with David's mother, and they decide to use mitten restraints to protect David's skin. They agree to use the restraints when David sleeps and when he is awake and alone. Katherine notes this decision in David's care plan, implements the required documentation according to her hospital's policy, and applies the restraints according to the proper procedure.

Katherine returns to work after two days off and finds that David's restraints have been applied improperly, leaving him at risk for injury. Recognizing that this may reflect a knowledge gap on the part of staff involved in David's care, she posts the instructions for the proper application of restraints at David's bedside, where they will be easily seen. Katherine also notes in David's care plan the need for proper use of restraints.

The need for the mitten restraints is reassessed daily, including feedback from David's mother. Volunteers visit him at the times he is most likely to be awake and alone, thus minimizing the need for restraints. Regular assessment and documentation are maintained according to the hospital's protocol. With continued treatment of David's illness, his skin condition improves, and within five days, the mitten restraints are discontinued.

Katherine and David's mother are pleased to see that David sustained no further scratch injuries once the restraints were implemented. David's mother states that although she does not like to see her baby restrained, she knows it is in his best interest. She appreciates the volunteers' efforts to spend time with David as well as everyone's diligence in applying the restraints properly. Katherine reflects upon this situation and decides that the next time she implements the use of restraints, she will post instructions for their use at the bedside immediately upon implementation.

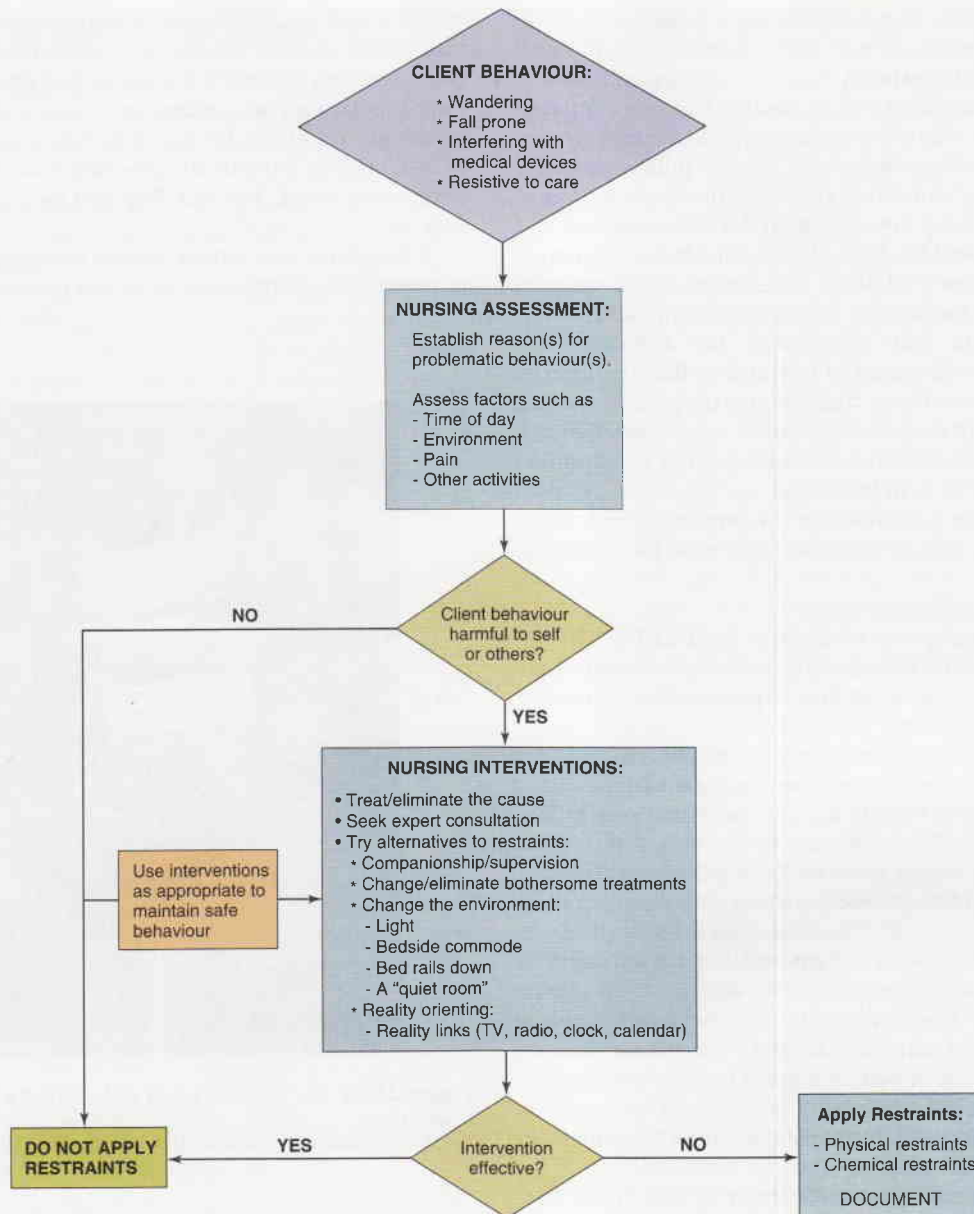


Figure 36-14 Algorithm for the use of restraints. **Source:** Developed from Ledford, L., & Mentals, J. (Written 1996; revised November 2005). "Restraints"—A research-based protocol. Iowa City, IA: University of Iowa Gerontological Nursing Interventions Research Center. Copyright © The University of Iowa Gerontological Nursing Interventions Research Center, Research Translation and Dissemination Core.

who are at risk for injury to self or others may need physical restraints temporarily. Alternative forms of restraint should always be considered as well. Physical restraints do not prevent falls and may actually increase the severity of an injury from a fall (Registered Nurses' Association of Ontario, 2005).

Whenever patients are physically restrained, there is a natural tendency for them to try to remove the restraint, and this can lead to injury. Restrained patients can easily become entangled in a restraint device when attempting to get out of it. In some cases, death has resulted from strangulation or asphyxiation. As a result, long-term care facilities and many health care facilities have banned the use of the jacket (vest) restraint. The use of any physical restraint is also associated with serious complications, including pressure ulcers; constipation; pneumonia; urinary and fecal incontinence; and

urinary retention. Contractures, nerve damage, and circulatory impairment are also potential hazards. In addition, restrained patients can experience humiliation, fear, anger, and a loss of self-esteem.

safety alert Routine assessment of a patient in a physical restraint is critical to prevent injury. The restraint must be moved and the patient repositioned at regular intervals, according to the agency's policy. Restraints should be used only after other alternatives have been tried, and the least restrictive method of restraint should be used. The use of restraints must be part of the patient's medical treatment. Restraints are considered a short-term intervention, and once they have been applied, regular assessments are needed to determine whether they should be continued. All assessments and interventions must be clearly documented according to the agency's policy.

For legal purposes, know the agency's policy and procedures for the appropriate use and monitoring of physical restraints. The use of a restraint must be clinically justified and be a part of the patient's prescribed medical treatment and care plan. A physician's order may be required, depending on provincial or territorial legislation and agency policy—in some settings, nurses may order restraints. Requirements for ordering restraints may vary depending on the circumstances of a patient's situation and the type of restraint needed; you must comply with the agency's policies. Assessment of patients who are restrained must be ongoing. Proper documentation, including the behaviours that necessitated the application of restraints, the procedure used in restraining, the condition of the body part restrained (e.g., circulation to the patient's hand), and the evaluation of the patient response, is essential. Remove the restraints periodically and assess the patient to determine if the restraints continue to be needed.

Skill 36-1 includes guidelines for the proper use and application of restraints. Use of restraints must meet the following objectives:

- Reduce the risk of patient injury
- Prevent the interruption of therapy, such as traction, IV infusion, nasogastric tube feeding, or Foley catheterization
- Prevent the confused or combative patient from removing life-support equipment
- Reduce the risk of injury to others by the patient

In keeping with current trends toward health promotion, improved assessment techniques and modifications of the environment are offered as alternatives to physical restraints. An **Ambularm** is a device worn on the leg that signals when the leg is in a dependent position, such as over the side rail or on the floor (Figure 36-15). The **Bed-Check** bed exit alarm system (Figure 36-16) uses a weight-sensitive sensor mat that can be placed on the patient's mattress or chair. This device sounds an audible alarm at the bedside when pressure is released off the sensor mat. Such devices are useful for patients who tend to climb out of bed unassisted but are in danger of falling. Other alarms can be placed on doors to alert staff or family members when a confused patient, prone to wandering, opens a door.

Another alternative form of restraint is the Posey Bed Enclosure (Figure 36-17), a soft-sided, self-contained enclosed

bed. It allows for freedom of movement and thus reduces the side effects caused by physical restraints such as pressure ulcers and loss of dignity. The Posey Bed Enclosure works well for patients who are restless and unpredictable, cognitively impaired, and at risk for injury if they were to fall or get out of bed, such as patients on anti-coagulant therapy at risk for intracranial bleed. The bed may also be a safer alternative to side rails.

A long-term care setting may be designed to include **environmental restraints**, such as locked nursing units. Residents

Text continued on p. 819



Figure 36-16 The Bed-Check bed exit alarm. **Source:** Courtesy Bed-Check Corp.



Figure 36-15 Patient wearing an Ambularm device.



Figure 36-17 The Posey Bed Enclosure. **Source:** Courtesy J. T. Posey Co., Arcadia, CA.

► SKILL 36-1 Applying Physical Restraints



Delegation Considerations

The application of physical restraints may be delegated to trained unregulated care providers (UCPs). Review the following with the UCP:

- Ask the UCP to inform you of any skin redness or excoriation, constriction of circulation under the restraint, or change in the patient's breathing.
- Review the correct placement of the restraint with the UCP and ask him or her to request assistance if the patient has any mobility restrictions that might affect how to remove or reapply a restraint.
- Instruct the UCP when and how to change the patient's position and to provide range-of-motion exercises, skin care, toileting, and opportunities for socialization.

However, you are always responsible for the assessment of a patient's safety needs, selection of appropriate alternative interventions, evaluation of the effectiveness of restraint, and ongoing assessment to prevent complications of restraint use.

Equipment

- Proper restraint: mitten, belt, extremity
- Padding (if needed)

Procedure

STEPS

1. Assess whether the patient needs a restraint. Does the patient continually try to interrupt needed therapy? Is the patient at risk for injuring self or others?
2. Assess the patient's behaviour, such as confusion, disorientation, agitation, restlessness, combativeness, or inability to follow directions. Consult with a gerontological nurse specialist if available.
3. Review your agency's policies regarding restraints. Consider the purpose, type, location, and duration of restraint. Determine whether signed consent for the use of restraint is needed.
4. Review manufacturer's instructions before entering the patient's room. Determine the most appropriate size restraint.
5. Perform hand hygiene and gather equipment.
6. Introduce yourself to the patient and family. Assess their feelings about restraint use. Explain that restraint is temporary and designed to protect the patient from injury.
7. Inspect the area where the restraint is to be placed. Assess the condition of skin underlying where the restraint is to be applied.
8. Approach the patient in a calm, confident manner. Check the patient's identification using two identifiers. Explain what you plan to do.
9. Adjust the bed to proper height, and lower the side rail on the side of patient contact.
10. Provide privacy. Make sure the patient is comfortable and in proper body alignment. Drape patient as needed.
11. Pad the skin and bony prominences (if necessary) before applying restraints.
12. Apply the appropriate-size restraint, making sure it is not over an IV line or other device (e.g., dialysis shunt) and that it does not cover the patient's identification or allergy bracelet.

RATIONALE

- Restraints are used only when other measures have failed to prevent the interruption of therapy such as traction, IV infusions, or nasogastric tube feedings; to prevent a confused or combative patient from self-injury by falling out of bed or a wheelchair; to prevent a patient from removing a urinary catheter, surgical drain, or life-support equipment; and to reduce the risk of injury to others by the patient.
- If patient's behaviour continues despite attempts to eliminate the cause of behaviour, use of physical restraint may be necessary.
- The least restrictive type of restraint must be ordered. A physician's order may be necessary—check provincial or territorial legislation and agency policy. Because restraints limit the patient's ability to move freely, you must make clinical judgements appropriate to the patient's condition and the agency policy.
- You should be familiar with all devices used for patient care and protection. Incorrect application of a restraining device may result in patient injury or death.
- Reduces transmission of microorganisms; promotes organization.
- Helps minimize patient anxiety during the application of the device, and helps minimize family concern during the maintenance of restraint.
- Restraints may compress and interfere with the functioning of devices or tubes. Inspection provides baseline assessment data regarding skin integrity.
- Reduces patient anxiety and promotes cooperation.
- Allows you to use proper body mechanics and prevent injury.
- Privacy protects self-esteem. Proper body alignment promotes comfort and prevents contractures and neurovascular injury.
- Padding reduces friction and pressure on skin and underlying tissues.
- IV lines and other therapeutic devices may become occluded. The patient's ID and allergy information must always be visible and accessible.

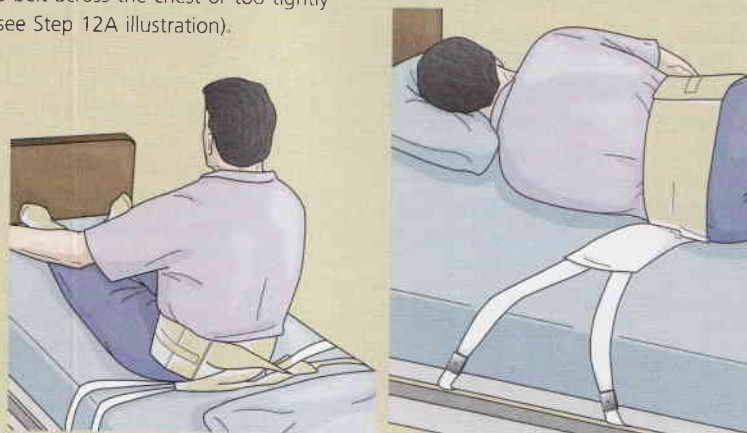
Continued

► SKILL 36-1 Applying Physical Restraints—cont'd

video

A. Belt restraint: This device secures the patient to a bed or stretcher. Apply it over the patient's clothes or gown. Remove wrinkles from the front and back of the restraint while placing it around the patient's waist. Bring ties through slots in the belt. Avoid placing the belt across the chest or too tightly across the abdomen (see Step 12A illustration).

- Restrains centre of gravity and prevents the patient from rolling off the stretcher or sitting up while on stretcher or from falling out of bed. Tight application may interfere with ventilation.



Step 12A Belt restraint is tied to the bed frame and to an area that does not cause the restraint to tighten when the side rail is raised or lowered. **Source:** Sorrentino, S. A. (2004). *Mosby's textbook for nursing assistants* (7th ed., p. 193). St Louis, MO: Mosby.

B. Extremity (ankle or wrist) restraint: This restraint is designed to immobilize one or all extremities. Commercially available limb restraints are composed of sheepskin or foam padding (see Step 12B illustration). The limb restraint is wrapped around the wrist or ankle with the soft part toward the skin and is secured snugly in place with Velcro straps.

- Maintains immobilization of the extremity to protect the patient from injury from a fall or accidental removal of a therapeutic device (e.g., IV tube or Foley catheter). Tight application may interfere with circulation.



Step 12B Extremity restraint being applied to the wrist.

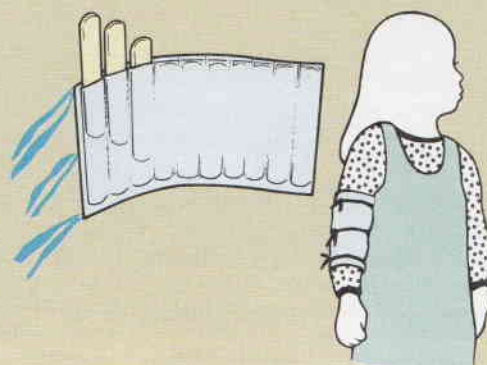
C. Mitten restraint: This thumbless mitten device is used to restrain the patient's hands (see Step 12C illustration). Place a hand in the mitten, being sure the mitten end is brought all the way over the wrist.

D. Elbow restraint: This piece of fabric with slots has tongue blades placed so that the elbow joint remains rigid (see Step 12D illustration).

- Prevents patients from dislodging invasive equipment, removing dressings, or scratching, yet allows greater movement than a wrist restraint.
- Commonly used with infants and children to prevent elbow flexion (e.g., when an IV line is in place).



Step 12C Mitten restraint.



Step 12D Elbow restraint.

► SKILL 36-1 Applying Physical Restraints—cont'd

video

E. **Mummy restraint:** The mummy restraint consists of a blanket or sheet. It is opened on the bed or crib with one corner folded toward the centre. The child is placed on the blanket with shoulders at the fold and feet toward the opposite corner (see Step 12E-1 illustration). With the child's right arm straight down against body, the right side of blanket is pulled firmly across the right shoulder and chest and secured beneath the left side of body (see Step 12E-2 illustration). The left arm is placed straight against the body, and the left side of the blanket is brought across the shoulder and chest and locked beneath child's body on the right side (see Step 12E-3 illustration). The lower corner is folded and brought over the body and tucked or fastened securely with safety pins (see Step 12E-4 illustration).

- Maintains short-term restraint of small child or infant for an examination or treatment involving the head and neck. Effectively controls movement of torso and extremities.



Step 12E Mummy restraint.

13. Attach restraints to the bed frame, which moves when the head of the bed is raised or lowered (see Step 13 illustration).

- Patient may be injured if restraint is secured to side rail and it is lowered.



Step 13 Tie restraint strap to the bed frame.

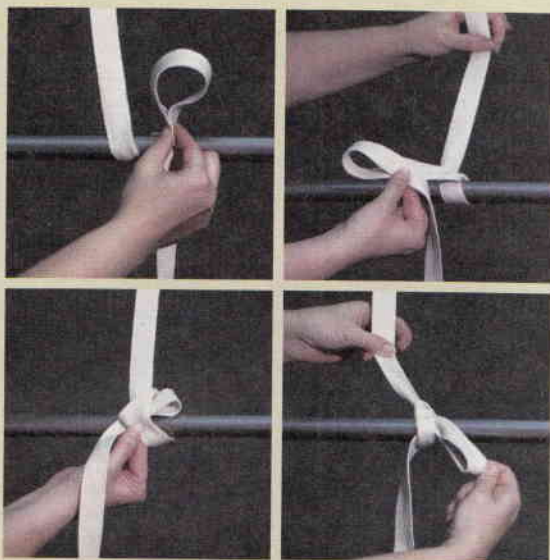
Critical Decision Point: Do not attach end of restraint to side rails.

Continued

► SKILL 36-1 Applying Physical Restraints—cont'd

video

14. Secure restraints with a quick-release tie (see Step 14 illustration). Do not tie in a knot.
15. Insert two fingers under the secured restraint (see Step 15 illustration).



Step 14 The Posey quick-release tie. **Source:** Courtesy JT Posey Co., Arcadia, CA.

- Allows for quick release in an emergency.
- A tight restraint may cause constriction and impede circulation. Checking for constriction prevents neurovascular injury.



Step 15 Place two fingers under the restraint to check tightness.

16. The proper placement of the restraint, skin integrity, pulses, temperature, colour, and sensation of the restrained body part should be assessed at least every hour or according to your agency's policy.
 17. Restraints should be removed at regular intervals (see agency policy). If the patient is violent and noncompliant, remove one restraint at a time or have staff assist while removing the restraints. The patient should not be left unattended at this time.
 18. Secure a call light or intercom system within the patient's reach.
 19. Leave the bed or chair with wheels locked. The bed should be in its lowest position.
 20. Perform hand hygiene.
 21. Reassess the patient's status and needs.
 - A. Inspect the patient for any injuries, including all hazards of immobility, while restraints are in use.
 - B. Observe IV catheters, urinary catheters, and drainage tubes to ensure that they are positioned correctly and that therapy remains uninterrupted.
 - C. Regularly reassess the patient's need for continued use of the restraint (for medical or surgical reason) with the intent of discontinuing the restraint at the earliest possible time (see agency-specific policy).
 - D. Provide appropriate sensory stimulation and reorient patient as needed.
- Frequent assessments prevent complications, such as suffocation, skin breakdown, and impaired circulation.
 - Provides opportunity to change patient's position and perform full range of motion, toileting, and exercise and to provide food or fluids.
 - Allows patient, family, or caregiver to obtain assistance quickly.
 - Locked wheels prevent the bed or chair from moving if the patient attempts to get out. If the patient falls when the bed is in lowest position, the chances of injury are reduced.
 - Reduces transmission of microorganisms.
 - Patient should be free of injury and not exhibit any signs of immobility complications.
 - Reinsertion can be uncomfortable and can increase the risk of infection or interrupt therapy.
 - Use of restraints should be seen as a temporary measure and discontinued as soon as possible (College of Nurses of Ontario, 2009b).
 - Use of restraints can further increase disorientation.

Unexpected Outcomes

Patient has signs of impaired skin integrity

Related Interventions

- Assess skin and provide appropriate therapy.
- Notify the physician and reassess the need for continued use of the restraint.
- Ensure the correct application of restraint. Pad the skin under the restraint, and remove restraint more often.

► SKILL 36-1 Applying Physical Restraints—cont'd

Patient has altered neurovascular status in an extremity (cyanosis, pallor, coldness of skin, or complaints of tingling, pain, or numbness)

Patient is increasingly confused, disoriented, or agitated

Patient escapes from restraint device and suffers fall or injury

- Remove the restraint immediately, stay with the patient, and notify the physician.
- Protect the extremity from further injury (e.g., pressure from tubing or encumbrance, positioning).
- Identify the reason for this change in behaviour, and attempt to eliminate the cause.
- Attempt a restraint alternative.
- Attend to the patient's immediate physical needs, and inform the physician.
- Reassess the type of restraint used, the correct application, and if alternatives can be used.

Recording and Reporting

- Record behaviours that place patient at risk for injury.
- Describe restraint alternatives attempted and patient's response.
- Record patient's and family's understanding of and consent to restraint application.
- Record type and location of the restraint and time applied.
- Record time of assessments and releases.
- Document the patient's behaviour after the application of the restraint.
- Document specific assessments related to orientation, oxygenation, skin integrity, circulation, and positioning.
- Describe the patient's response when restraints were removed.

Home Care Considerations

- Plan care with family. If possible, use of an Ambularm may free patient from physical restraints.
- Instruct family members (or other caregivers) in the use of alternatives to restraints (see Box 36-12).
- A physical restraint may require a physician order. The restraint should not be sent home with family unless the device is needed to protect the patient from injury. If physical restraints are necessary, the family members (or other caregivers) must be instructed in its proper application, the care needed while in restraints, and the complications for which to look. Also inform caregivers whom to contact if any abnormal findings occur.
- A patient who needs to be restrained in bed should have a hospital bed and will require constant supervision in the home.

with dementia may be at risk for injury if they wander away from their unit or building. A locked nursing unit can be designed to permit individuals the freedom to wander safely around their unit and can include exits to secure, enclosed outdoor spaces when weather permits. A locked unit is still a form of restraint and should be implemented only after alternatives to restraint have proven unsuccessful.

In some situations, chemical restraints may be indicated. **Chemical restraint** is defined as “any form of psychoactive medication used, not to treat illness, but to intentionally inhibit a particular behaviour or movement” (College of Nurses of Ontario, 2009b, p. 4). For example, it may be necessary to sedate a patient who is consistently pulling out a nasogastric tube. As with any other restraint, chemical restraints should be implemented only after nonrestraining measures (e.g., distraction, use of a sitter) have proven ineffective and with the informed consent of the patient or their substitute decision maker. Proper adherence to medication administration guidelines is vital to the safe use of chemical restraints, and the patients' response to and need for these medications must be assessed on a regular basis.

Side Rails. Side rails may help to increase a patient's mobility and stability when in bed or when moving from the bed to a chair. Side rails also help prevent the unconscious patient from falling out of bed or off a stretcher (Figure 36-18). However, raised side rails that cannot be opened by the patient are considered a restraint (College of Nurses of Ontario, 2009b). The use of side rails for a disoriented patient may cause more confusion and further injury. A confused patient who is determined to get out of bed may attempt to climb over the side rail



Figure 36-18 Side rails in the up position on a stretcher.

or climb out at the foot of the bed, often resulting in a fall or injury. Nursing interventions to reduce a patient's confusion should first focus on the cause of the confusion. Frequently, a patient's attempt to explore his or her environment or to self-toilet is mistaken as confusion. A thorough assessment is essential. Whenever side rails are used, the bed should be maintained in the lowest position possible.

Electrical Hazards. Electrical equipment must be maintained in good working order and should be grounded. The third (longer) prong in an electrical plug is the ground. Theoretically, the ground prong carries any stray electrical current back to the ground—hence, its name. The other two prongs

* BOX 36-14 PATIENT TEACHING

Prevention of Electrical Hazards in the Home

Objective

- Patient will recognize electrical hazards in the home and eliminate them.

Teaching Strategies

- Discuss grounding appliances and other equipment.
- Provide examples of common hazards: frayed cords, damaged equipment, and overloaded outlets.
- Discuss guidelines to prevent electrical shocks:
 - Use extension cords only when necessary, and use electrical tape to secure the cord to the floor where it will not be stepped on.
 - Do not run wires under carpeting.
 - Teach the patient to grasp the plug, not the cord, when unplugging items.
 - Teach the patient to keep electrical items away from water.
 - Teach the patient not to operate equipment with which he or she is unfamiliar.
 - Teach the patient to disconnect items before cleaning them.

Evaluation

- Have patient list electrical hazards existing in the home.
- Review with the patient the steps he or she will take to eliminate these hazards.
- Reassess the home after the patient has had an opportunity to eliminate the hazards.



Knowledge

- Effect of new medication therapies on the patient's cognitive/motor functioning
- Characteristics of safe and unsafe patient behaviours
- Characteristics of a safe environment

Experience

- Previous patient responses to planned nursing therapies to improve the patient's safety (e.g., what worked and what did not work)

Evaluation

- Reassess the patient for the presence of physical, social, environmental, or developmental risks
- Determine if changes in the patient's care resulted in increased threats to safety
- Ask if the patient's expectations are being met

Standards

- Use established expected outcomes to evaluate the patient's response to care (e.g., reduction in modifiable risk factors)

Qualities

- Display humility when rethinking unsuccessful interventions designed to promote patient safety
- Demonstrate responsibility for accurately evaluating nursing interventions designed to promote the patient's safety

Figure 36-19 Critical thinking model for safety evaluation.

carry the power to the piece of electrical equipment. Improperly grounded or malfunctioning electrical equipment increases the risks of electrical injury and fire. Educating both the patient and the family can reduce the risk for electrical hazards in the home environment (Box 36-14).

If a patient receives an electrical shock in a health care setting, immediately determine whether the patient has a pulse. If the patient has no pulse, cardiopulmonary resuscitation should be initiated and emergency personnel should be notified. If the patient has a pulse and remains alert and oriented, quickly obtain vital signs and assess the skin for signs of thermal injury. The patient's physician must be notified. If an electrical shock occurs in the home, follow the same procedure but have the patient go to the emergency department and then notify the patient's physician.

Seizures. Patients with a history of seizures and those who have experienced some form of neurological injury or metabolic disturbance may be at risk for a seizure. **Seizure precautions** are nursing interventions during and after a seizure and include protecting the patient from traumatic injury, positioning the patient for adequate ventilation and drainage of oral secretions, and providing privacy and support following the seizure (Skill 36-2). It is important that you observe the patient carefully before, during, and after the seizure and document assessments accurately.

Radiation. Radiation is a health hazard in the health care setting and the community. Radiation and radioactive materials are used in the diagnosis and treatment of patients. Hospitals have strict guidelines on the care of patients who are receiving radiation and radioactive materials. Familiarize

yourself with the agency's established protocols. Exposure to radiation can be reduced by limiting the time spent near the source, making the distance from the source as great as possible, and using shielding devices such as lead aprons. Staff working near radiation wear devices that track accumulative exposure to radiation.

The community can be at risk for radiation exposure if there has been incorrect disposal and transportation of radioactive waste products. The Canadian Nuclear Safety Commission ensures that the disposal of radioactive waste does not pose a danger for the public or the environment. If a radioactive leak occurs, this commission institutes measures to prevent the exposure of surrounding neighbourhoods, to clean up radioactive leaks as quickly as possible, and to ensure that injured parties receive prompt medical care.

❖ Evaluation

Patient Care

The components of critical thinking are applied to the evaluation step of the nursing process (Figure 36-19). The actual care delivered by the health care team is evaluated on the basis of expected outcomes. If the patient's goals have been met, the nursing interventions can be considered effective and appropriate. If not, determine whether new risks to the patient have developed or whether previous risks remain. The patient and family need to participate to find permanent ways to reduce risks to safety. Continually assess the patient's and family's

► SKILL 36-2 Seizure Precautions

Delegation Considerations

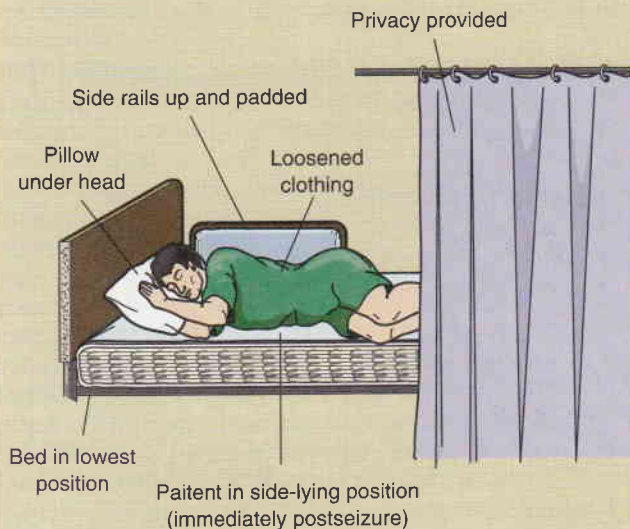
Assessment of a patient's need for seizure precautions cannot be delegated to an unregulated care provider (UCP). If a seizure occurs, you must constantly assess the patient's airway patency, adequacy of breathing, and circulatory status. Clinical judgements must be made quickly. The tasks of setting up seizure precautions and protecting patients at risk for seizures may be delegated to a UCP:

- Inform the UCP about a patient's history of seizures and factors that may trigger a seizure.
- Caution the UCP against any attempt to restrain the patient's extremities or place anything in the patient's mouth during a seizure.

Procedure

STEPS

1. Assess seizure history, noting the frequency of seizures, presence of aura, and sequence of events, if known. Assess for medical and surgical conditions that may lead to seizures or exacerbate existing seizure condition. Assess medication history.
2. Inspect the patient's environment for potential safety hazards if risk for seizure exists, such as a bedside stand or table, an IV pole, or other medical equipment.
3. Perform hand hygiene and prepare bed with padded side rails and headboard. Set the bed in the low position, and place the patient in side-lying position when possible (see Step 3 illustration).
4. For patients with a history of seizures ensure that items such as an airway (see Step 4 illustration), suction apparatus, disposable gloves, and pillows are visible in the hospital setting for immediate use.



Equipment

- Oral airway
- Padding for side rails and headboard
- Suction machine, oral suction equipment
- Disposable gloves

RATIONALE

- Enables you to anticipate the onset of seizure activity. Seizure medications must be taken as prescribed and not stopped suddenly because this may precipitate seizure activity.
- Prevents patient from sustaining injury by striking head or body on furniture or equipment.
- Minimizes risks associated with seizure activity.
- Ensures a prompt, organized intervention.



Step 4 Oral airways.

Step 3 Provide patient privacy. Put bed in lowest position with side rails up and padded. Position patient in side-lying position, with pillow under head, and loosen clothing.

5. When a seizure begins, position patient safely. If patient is standing or sitting, guide the patient to floor and protect his or her head by cradling it in your lap or placing a pillow under the head. Clear the surrounding area of furniture. If the patient is in bed, raise the side rails, add padding, and put the bed in low position.

- Protects patient from traumatic injury, especially a head injury.

Continued

► SKILL 36-2 Seizure Precautions—cont'd

6. Provide privacy.
 7. If possible, turn patient on side, with head flexed slightly forward.
 8. Do not restrain patient. Loosen patient's clothing.
 9. Do not put anything into the patient's mouth such as fingers, tongue depressor, or medicine.
- Embarrassment is common after a seizure, especially if others witness the seizure.
 - Prevents tongue and dentures from blocking the airway and promotes drainage of secretions, thus reducing the risk of aspiration.
 - Prevents musculoskeletal injury.
 - Putting something in the patient's mouth could result in injury to the patient.

Critical Decision Point: Objects in the patient's mouth could cause injury to the jaw, tongue, or teeth and cause stimulation of the gag reflex, causing vomiting, aspiration, and respiratory distress (Epilepsy Canada, 2005).

10. Stay with the patient, observing the sequence and timing of seizure activity.
 11. After the seizure is over, explain what happened and answer the patient's questions. Foster an atmosphere of acceptance and respect.
 12. Following the seizure, assist the patient to a position of comfort in bed with padded side rails up and the bed in low position. Place a call light within reach, and provide a quiet, nonstimulating environment. Perform hand hygiene before leaving the room.
- Continued observation is necessary to ensure adequate ventilation during and following seizure activity. Accurate, specific observations will assist in the documentation, diagnosis, and treatment of the seizure disorder.
 - Informing patients of the type of seizure activity experienced assists them in participating knowledgeably in their care.
 - Provides for continued safety. Patients are often confused and sleepy following a seizure.

Status Epilepticus

For a patient experiencing status epilepticus, the following actions are required:

13. Put on disposable gloves and insert an oral airway (see Step 4 illustration) when the jaw is relaxed between seizure activities. Hold the airway with curved side up, insert downward until airway reaches back of throat, then rotate and follow natural curve of the tongue. Do not place fingers near or in the patient's mouth.
 14. Access oxygen and suction equipment. Prepare for IV insertion.
 15. Use pillows or pads to protect the patient from injuring self.
- Prevents transmission of infection. Patient is in continual seizure state and requires oral airway to ensure airway patency. Patient may inadvertently bite fingers during a seizure if caution is not used.
 - Intensive monitoring and treatment are required for this medical emergency.
 - Traumatic injury is avoided.

Unexpected Outcomes

Patient suffers traumatic injury

Related Interventions

- Continue to protect the patient from further injury.
- Notify the physician immediately.
- Ensure the environment is free of safety hazards.

Recording and Reporting

- Record the timing of seizure activity and the sequence of events. Record the presence of aura (if any), level of consciousness, posture, colour, movements of extremities, incontinence, and patient's status following the seizure.
- Document patient's response and expected or unexpected outcomes.
- Report to the physician immediately as seizure begins. Status epilepticus is an emergency situation requiring immediate medical management.

Home Care Considerations

- Communicate with the patient and family to identify precipitating factors.
- Teach the family to care for the patient during a seizure.
- The patient's home should be assessed for environmental hazards in light of the seizure condition.
- Provide the family with guidelines to detect status epilepticus.
- Until a seizure condition is well controlled (usually for at least one year), the patient should not take a tub bath or engage in activities such as swimming unless a knowledgeable family member is present. Driving may also be restricted during this time.
- The patient should wear a medical alert bracelet or tag and have an identification card noting the presence of a seizure disorder and listing the medications taken.
- Referral to a support group or Epilepsy Canada may help to improve the patient's self-esteem and coping ability.

need for additional support services, such as home care, physiotherapy, counselling, and further teaching.

Patient Expectations

When you have developed a good relationship with a patient and the patient feels safe and secure in the environment, he or she will most likely demonstrate satisfaction. You must determine, however, if patient expectations have been met. Is the patient satisfied with any changes made to the environment? Does the patient believe that his or her safety is ensured? If patient expectations have not been met, you must reassess not only the patient and the environment, but also the patient's expressed desires.

❖ KEY CONCEPTS

- A safe environment is essential to promoting, maintaining, and restoring health.
- Nurses must maintain their own safety in order to provide safe care to patients.
- In the community, a safe environment is one in which basic needs are achievable, physical hazards are reduced, the transmission of pathogens is reduced, pollution is controlled, and sanitation is maintained.
- In a health care agency, a safe environment is one that minimizes falls, patient-inherent accidents, procedure-related accidents, and equipment-related accidents.
- A factor that reduces atmospheric oxygen is the presence of high carbon monoxide levels, which may result from an improperly functioning furnace.
- Prolonged exposure to extreme environmental temperatures can cause patient injury or even death.
- The reduction of physical hazards in the environment includes providing adequate lighting, decreasing clutter, and securing the home.
- The transmission of pathogens is reduced through medical and surgical asepsis, immunization, adequate food sanitation, insect and rodent control, and the appropriate disposal of human waste.
- Children less than five years of age are at the greatest risk for home accidents that may result in severe injury and death.
- The school-aged child is at risk for injury at home, at school, and while travelling to and from school.
- Adolescents are at risk for injury from automobile accidents, suicide, and substance abuse.
- Threats to an adult's safety are frequently associated with lifestyle habits.
- Risks of injury for older patients are directly related to the physiological changes of the aging process; falls are the greatest cause of accidental injury in older adults.
- By incorporating critical thinking skills in the application of the nursing process, you assess the patient and the environment to determine risk factors for injury; cluster risk factors; formulate a nursing diagnosis; and plan specific interventions, including patient education.
- Nursing interventions for promoting safety are individualized for developmental stage, lifestyle, and environment.
- Nursing interventions are developed to modify the environment for protection from falls, fires, poisoning, and electrical hazards.
- The expected outcomes include a safe physical environment, a patient whose expectations have been met and who is

knowledgeable about safety factors and precautions, and a patient free of injury.

❖ CRITICAL THINKING EXERCISES

1. Mrs. Santiago, who is 88 years old and has been functioning independently at home, was recently admitted to the hospital. Through your admission assessment, you learn that she experiences urinary frequency and urgency and occasional dizziness. When you perform the "Get up and Go" test, you find that she can get up on her own successfully after multiple attempts. Use the Hendrich II Fall Risk Model (see Table 36-1) to determine Mrs. Santiago's risk for a fall, and design specific interventions to ensure her safety in the hospital.
2. Mrs. Patel, a 76-year-old long-term care resident with Alzheimer's disease, has been refusing food and fluids for the past month. The family has agreed to the placement of a nasogastric tube to improve her fluid and nutritional statuses. Shortly after the first tube feeding was started, Mrs. Patel became more restless, and she has been picking at the tube.
 - a. What might be precipitating Mrs. Patel's behaviour of picking at the tube?
 - b. What approaches can be used to eliminate interference with the treatment?
 - c. If a restraint is necessary to avoid the disruption of therapy, what interventions are required to ensure the patient's safety while in restraints?
3. A family member of a patient reports that, just a few minutes ago, a lit cigarette dropped on the patient's mattress but that the small fire was put out. What actions are needed to ensure the safety of this patient?

❖ REVIEW QUESTIONS

1. Accidental injuries are the leading cause of death for which age group?
 1. 1 to 12 months
 2. 1 to 34 years
 3. 45 to 64 years
 4. 65 years and over
2. Adolescents are at a greater risk for injury from
 1. Poisoning, drowning, motor vehicle accidents
 2. Motor vehicle accidents, suicide, and substance abuse
 3. Home accidents, motor vehicle accidents, fire
 4. Falls, suicide, drowning
3. The physiological changes caused by aging increase the older patient's risk for
 1. Falls
 2. Suicide
 3. Alcoholism
 4. Seizures
4. WHMIS is a system to control hazardous substances in the workplace and includes
 1. Environmental interventions and cautionary labelling of products
 2. Worker education programs and the provision of MSDSs
 3. Patient education programs and worker education programs
 4. Risk assessment and the provision of MSDSs

5. Medication and fluid administration errors and the improper application of external devices are examples of
 1. Patient-inherent accidents
 2. Procedure-related accidents
 3. Equipment-related accidents
 4. Environmental-related accidents
6. You must always use a mechanical lift to move a heavy patient when
 1. You are by yourself
 2. The patient can bear weight on one leg
 3. The patient is bigger than you are
 4. The patient cannot bear weight on either leg
7. Which of the following statements about restraints is *not* true?
 1. Restraints are used only after other alternatives have been tried.
 2. The least restrictive method of restraint should be used.
 3. Restraints are considered a long-term intervention.
 4. If a restraint is used, it must be part of the patient's medical treatment.
8. When teaching parents about responding to poisoning in children, you should instruct them to
 1. Give oral fluids
 2. Induce vomiting
 3. Call the local poison control centre
 4. Drive the child to the emergency department
9. All of the following are acceptable alternatives to the use of restraints, *except*
 1. Attending to needs for toileting, food, and liquid
 2. Offering diversionary activities, such as music or something to hold
 3. Camouflaging IV lines with clothing or a stockinette
 4. Ensuring that a family member is with the patient at all times

✦ RECOMMENDED WEB SITES

Canada Safety Council: <http://canadasafetycouncil.org/>

The Canada Safety Council is a national, nongovernmental, charitable organization dedicated to providing safety education. Its mission is to reduce preventable deaths and injuries in public and private places throughout Canada.

Canadian Patient Safety Institute: <http://www.patientsafetyinstitute.ca/English/Pages/default.aspx>

Part of Health Canada, the Canadian Patient Safety Institute has been a leader in addressing patient safety issues in Canadian health care agencies. This Web site provides links to various topics relevant to promoting patient safety.

DriveABLE: <http://driveable.com/>

This Web site is a useful resource for nurses working with patients who need to make a decision to stop driving. DriveABLE is an Alberta-based company that provides objective and evidence-informed approaches to assessing driver ability, as well as resources for supporting individuals and families through this process.

Safe Kids Canada: <http://www.safekidscanada.ca/gateway.aspx>

Part of the national injury prevention program at Toronto's Hospital for Sick Children, Safe Kids Canada offers information on a range of safety topics to prevent accidental injuries in children.

SMARTRISK: <http://www.smartrisk.ca/>

SMARTRISK is a national nonprofit organization dedicated to preventing injuries and saving lives. Founded in 1992, SMARTRISK has become one of the leading injury-prevention groups in Canada and enjoys international recognition and support.

Workplace Hazardous Materials Information System: <http://www.hc-sc.gc.ca/ewh-semt/occup-travail/whmis-simdt/index-eng.php>

This Web site is developed and maintained by Health Canada's WHMIS Division and includes policies and information related to WHMIS.

Review Question Answers

1. 2; 2. 2; 3. 1; 4. 2; 5. 2; 6. 4; 7. 3; 8. 3; 9. 4

Rationales for the Review Questions appear at the end of the book.

Hygiene

Original chapter by Deborah Marshall, MSN

Canadian content written by Yvonne G. Briggs, RN, BScN, MN

objectives

Mastery of content in this chapter will enable you to:

- Define the key terms listed.
- Discuss common factors that influence personal hygiene practices.
- Discuss the role that the nursing process and critical thinking play in the provision of hygiene care.
- Conduct a comprehensive assessment of a patient's total hygiene needs.
- Understand the importance of foot care for the diabetic patient.
- Describe conditions that place the patient at risk for problems related to the hair, scalp, integument, feet, nails, eyes, ears, nose, mouth, and throat and discuss their related interventions.
- Describe how hygiene care for the older patient may differ from that for the younger patient.
- Discuss the different approaches used in maintaining a patient's comfort and safety during hygiene care.
- Successfully perform hygiene for care of the integument; perineum; feet, hands, and nails; mouth; and eyes, ears, and nose.

evolve WEBSITE

<http://evolve.elsevier.com/Canada/Potter/fundamentals/>

- Audio Chapter Summaries
- Examination Review Questions
- Glossary
- Skills Performance Checklists
- Student Learning Activities
- Video Clips
- Weblinks

media resources

key terms

Acne, p. 833	Halitosis, p. 883
Alopecia, p. 833	Lunula, p. 827
Buccal mucosa, p. 827	Maceration, p. 826
Cerumen, p. 833	Mastication, p. 827
Complete bed bath, p. 842	Neuropathy, p. 831
Cuticle, p. 826	Partial bed bath, p. 842
Dermis, p. 827	Perineal care, p. 850
Enucleation, p. 864	Periodontal disease, p. 827
Epidermis, p. 826	Stomatitis, p. 833
Gingivitis, p. 827	Xerostomia, p. 837

Personal hygiene affects an individual's comfort, safety, and physical and psychological well-being. Individuals who are well are capable of meeting their own hygiene needs, but those who are ill or have disabilities may require various levels of assistance. Many personal, social, and cultural factors can influence hygiene practices. In agency or home care settings, determine a patient's ability to perform self-care and provide hygiene care according to the patient's needs and preferences. In the home setting, assist in helping the patient and family to adapt hygiene techniques and approaches.

Because hygiene care requires close contact with the patient, therapeutic communication skills should be used (see Chapter 17) to build and promote a caring therapeutic relationship and to assist you in providing the patient with teaching regarding hygiene care. Other nursing activities can be integrated during hygiene care, including patient assessment and interventions, such as range-of-motion exercises, the application of dressings, and the inspection and care of intravenous (IV) sites. During hygiene care, the patient's independence is encouraged and promoted as much as possible, privacy is ensured, respect is conveyed, and physical comfort and safety is maintained and supported.

Scientific Knowledge Base

Proper hygiene care requires an understanding of the anatomy and physiology of the integument, oral cavity,

eyes, ears, nose, hands, feet, and nails. The skin and mucosal cells exchange oxygen, nutrients, and fluids with underlying blood vessels. The cells require adequate nutrition, hydration, and circulation to resist injury and disease. Good hygiene techniques assist in promoting the normal structure and function of body tissues.

In addition, knowledge of pathophysiology is applied to provide skilled preventive hygiene care. Learn to recognize disease states that create changes in the integument, oral cavity, and sensory organs. For example, diabetes mellitus results in chronic vascular changes that impair healing of the skin and mucosa. In the early stages of acquired immune deficiency syndrome (AIDS), fungal infections of the oral cavity are common. Stroke can result in paralysis of the trigeminal nerve, which eliminates the blink reflex, increasing the risk for corneal drying. In the presence of conditions such as these, hygiene practices are adapted to anticipate patient needs and minimize harmful effects. By integrating knowledge of anatomy, physiology, and pathophysiology during hygiene care, you can recognize abnormalities and initiate appropriate actions to prevent further injury.

The Skin

The skin is an active organ with the functions of protection, secretion, excretion, temperature regulation, and sensation (Table 37-1). The skin has three primary layers: epidermis,

dermis, and subcutaneous (see Chapter 31). Bacteria commonly reside on the outer layer (the **epidermis**). These resident bacteria are normal flora (see Chapter 32); they do not cause disease but instead inhibit the multiplication of disease-causing microorganisms.

The skin can provide crucial information regarding a patient's health status and provide important information regarding the functioning of other systems and organs (see Chapter 31).

The Feet, Hands, and Nails

The feet, hands, and nails often require special attention to prevent infection. Any injury or deformity to the foot, including growths or injuries to the overlying skin and nails, can be painful and thus interfere with a patient's normal ability to walk and weight-bear.

The hand, in contrast to the foot, is constructed largely for manipulation rather than support. Dexterity exists in the hand because of the wide range of movement between the thumb and fingers. Any condition that interferes with the movement of the hand (e.g., superficial or deep pain or joint inflammation) can impair a patient's self-care abilities.

The nails are epithelial tissues that grow from the root of the nail bed, which is located in the skin at the nail groove and hidden by the fold of skin called the **cuticle**. The visible part of the nail is the nail body. It has a crescent-shaped white area

► **TABLE 37-1** Function of the Skin and Implications for Care

Function and Description	Implications for Care
Protection The epidermis is relatively impermeable and protects the body from environmental stress (e.g. trauma, pathogens) and environmental factors (e.g. heat, cold).	Weakening of the epidermis occurs by scraping or stripping its surface (e.g., through the use of dry razors, tape removal, or improper turning or positioning techniques). Excessive dryness causes cracks and breaks in the skin and mucosa that allow bacteria to enter. Emollients soften the skin and prevent moisture loss, and hydration of the mucosa prevents dryness. Constant exposure of skin to moisture can cause maceration (softening), which interrupts dermal integrity and promotes ulcer formation and bacterial growth. Bed linen and clothing should be kept dry. Misuse of soaps, detergents, cosmetics, and deodorants can cause chemical irritation. Alkaline soaps neutralize the protective acid condition of skin. Cleansing of skin removes excess oil, sweat, dead skin cells, and dirt that can promote bacterial growth. Bath water should not be excessively hot or cold.
Sensation The skin contains sensory organs for touch, pain, temperature, and pressure.	Friction should be minimized to avoid the loss of the stratum corneum, which can result in the development of pressure ulcers. Smoothing linen removes sources of mechanical irritation. To prevent accidental injury of the patient's skin, nurses should remove their own jewellery before giving care.
Temperature Regulation Body temperature is controlled by evaporation of perspiration, radiation, and conduction of heat from the body when blood vessels of the skin are vasodilated through lack of perspiration and vasoconstriction.	Factors that interfere with heat loss can alter temperature control. Wet bed linens or gowns interfere with convection, conduction, and evaporation. Excess blankets or bed coverings can interfere with heat loss through radiation and conduction and promote heat conservation.
Absorption and Secretion The skin allows limited excretion of some metabolic wastes and by-products such as minerals, sugars, and uric acid. Sebum lubricates and softens the skin and hair and decreases the amount of heat loss from the skin.	Perspiration and oil can harbour microorganisms. Bathing removes excess body secretions; however, excessive bathing can cause drying of the skin.

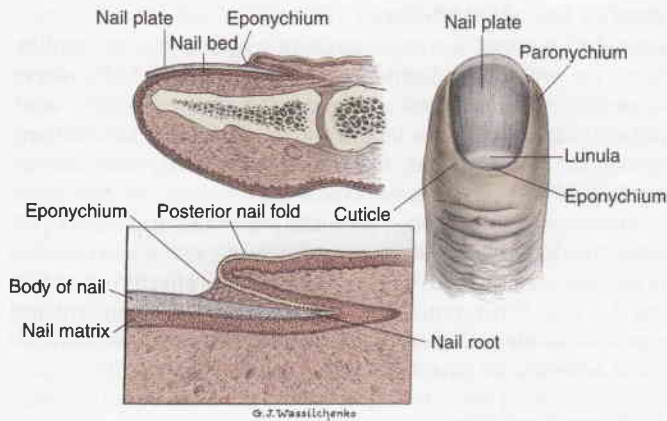


Figure 37-1 Anatomical structure of a normal nail. **Source:** From McFarland, G. K., Hirsch, J. E., Tucker, S. M., & Thompson, J. M. (Eds.). (1997). *Mosby's clinical nursing* (4th ed.). St Louis, MO: Mosby.

known as the **lunula**. Under the nail lies a layer of epithelium called the nail bed (Figure 37-1). In light-skinned individuals, a healthy nail is transparent, smooth, and convex, with a pink nail bed and translucent white tip. Some disease processes can cause changes in the shape, thickness, and curvature of the nail (see Chapter 31).

The Oral Cavity

The oral cavity extends from the lips to the anterior pillars of the tonsils. It is the structure for taste, **mastication**, and speech articulation. The **buccal mucosa** (oral mucosa) are normally light pink and moist. The floor of the mouth and the under-surface of the tongue are richly supplied with blood vessels, which allows for rapid absorption of sublingual medications (e.g., nitroglycerin). Any type of ulceration or trauma to the area can result in significant bleeding. The mouth also contains three pairs of salivary glands that start the digestive process by releasing enzymes, protect the mucosa from heat and chemical irritants, transmit taste information, and provide lubrication for the movement of food. Salivary secretion can be decreased by medications and disease processes.

There are 32 permanent teeth for chewing, or mastication. They are designed to cut, tear, and grind food so that it can be mixed with saliva and swallowed. A normal tooth consists of a crown, neck, and root (Figure 37-2). The periodontal membrane lies just below the gum margins, surrounds a tooth, and holds it firmly in place. Healthy teeth are free from cavities and are properly aligned.

Difficulty with chewing can develop when gum tissues become inflamed or infected or when teeth are lost or become loose. Regular oral hygiene is necessary to maintain the integrity of tooth surfaces and to prevent **gingivitis** (gum inflammation) and **periodontal disease**.

The Hair

Hair is produced by hair follicles located in the **dermis** (Figure 37-3). Hair growth, distribution, and pattern can indicate a person's general health status. Hormonal changes, emotional and physical stresses, aging, infection, and certain illnesses can affect hair colour and condition. The hair shaft itself is inert and cannot be directly affected by physiological factors. However, changes in its colour or condition are caused by hormonal or nutrient deficiencies of the hair follicle (see Figure 37-3).

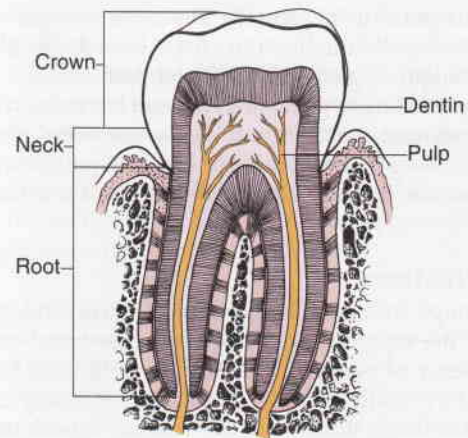


Figure 37-2 A normal tooth.

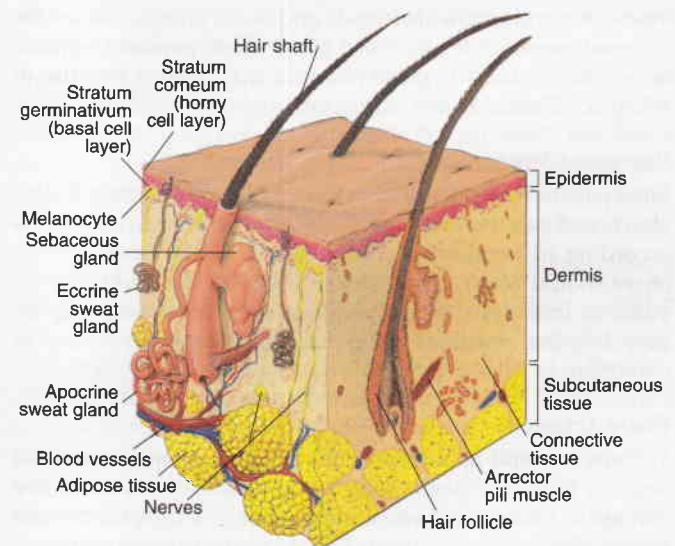


Figure 37-3 Hair follicles and relationship of follicles and their related structures to the epidermal and dermal layers of the skin. **Source:** From Lewis, S. M., Heitkemper, M. M., Dirksen, R. R., et al. (2007). *Medical-surgical nursing: Assessment and management of clinical problems* (7th ed., p. 450, Fig. 23-1). St Louis, MO: Mosby.

The Eyes, Ears, and Nose

The eyes, ears, and nose require careful attention during the provision of hygiene. Chapter 31 describes the structure and function of these organs. Cleansing of these sensitive sensory tissues should be done in a way that prevents injury and discomfort for the patient, such as being careful not to get soap in the patient's eyes. In addition, the time that is spent with a patient during hygiene provides an excellent opportunity to ask whether he or she has experienced any changes in vision, hearing, or sense of smell.

Nursing Knowledge Base

Hygiene care is never routine; the care requires intimate contact with patients, and good communication skills are necessary to build and promote a therapeutic relationship. No two

individuals perform hygiene in the same manner, and it is important to individualize care from knowledge about the patient's unique hygiene practices and preferences.

While providing hygiene care, you can learn about patients' health promotion practices and needs, emotional needs, and needs pertaining to health care education. A patient's personal preferences for hygiene can be influenced by a number of factors.

Social Practices

Social groups influence hygiene preferences and practices, including the type of hygiene products used and the nature and frequency of personal care. During childhood, hygiene is influenced by family customs, including, for example, the frequency of bathing, the time of day bathing is performed, and the type of oral hygiene practised. As children enter their adolescent years, personal hygiene may be influenced by peer group behaviour, and they may become more interested in their personal appearance. For example, girls may begin to wear makeup, and boys may begin shaving. During the adult years, involvement with friends and work groups shapes the expectations individuals have about their personal appearance. Older adults' hygiene practices may change because of living conditions, health status, and available resources.

Personal Preferences

Each patient has individual preferences about when to bathe, shave, and perform hair care. Patients select different products according to personal preferences and needs. These preferences should assist you in delivering individualized care for patients. In addition, you should assist patients in developing new hygiene practices when necessitated by an illness or condition.

Body Image

Patients' general appearance may reflect the importance that hygiene holds for them. Body image is a person's subjective concept of his or her physical appearance (see Chapter 25), and it can change frequently. When patients undergo surgery, illness, or a change in physical or mental health status, body image can alter dramatically. For this reason, effort should be taken to promote patients' hygienic comfort and appearance.

Body image affects the way in which hygiene is maintained. If patients are neatly groomed, you should consider the details of grooming when planning care and consult with the patients before making decisions about how hygiene care is to be provided. Patients who appear unkempt or uninterested in hygiene may require an assessment of their hygiene practices or additional education about the importance of hygiene.

Socioeconomic Status

A person's economic resources can influence the type and extent of hygiene practices used. You should be sensitive in considering whether a patient's economic status influences his or her ability to regularly maintain hygiene. When patients have the added problem of a lack of resources, it becomes difficult to participate and take a responsible role in health promotion activities such as basic hygiene.

When basic care items are not affordable, alternatives need to be considered. It is also important to assess whether the use of these products is an acceptable practice among patients' social or cultural group. For example, not all patients may choose to use deodorant or cosmetics.

Health Beliefs and Motivation

Knowledge about the importance of hygiene and its implications for well-being influences hygiene practices. However, knowledge alone is not enough. According to Pender et al. (2006), individual characteristics such as personal factors (psychological, sociocultural, and biological) directly influence an individual's health promotion activities.

It is important to know, for example, whether patients perceive that they are at risk for dental disease, that dental disease is serious, and that brushing and flossing are effective in reducing this risk. When patients recognize that a risk is present and that reasonable action can be taken to reduce the risk, they are more receptive to counselling and teaching efforts.

Cultural Variables

Patients' cultural beliefs and personal values can influence hygiene care (Box 37-1). Individuals from diverse cultural backgrounds follow different self-care practices (see Chapter 9). Feelings of disapproval must not be conveyed when caring for patients whose hygienic practices are different from your own. In some cultures, it is customary to bathe once a week; in North America, it is common to bathe or shower daily.

Physical Condition

Patients with certain types of physical limitations, disabilities, or pain often lack the physical energy, dexterity, and range of

► BOX 37-1 Cultural Influences on Hygiene

Patients need a culturally competent plan for hygiene care. For some, hygiene practices are influenced by culture and are a potential source of conflict and stress in a hospital environment. Hygiene is a very personal matter and bathing, perineal hygiene, and hair care practices can be sensitive issues. Using knowledge from theoretical models allows the health care provider to provide culturally sensitive care that respects and incorporates the patient's cultural background.

Implications for Practice

- Maintain privacy, especially for women from cultures that value female modesty.
- Be aware that in some cultures, touch has many different meanings: touching the shoulder of a Japanese man can cause feelings of humiliation; Asian women do not shake hands with other women or men; for some Aboriginal people, touch can mean a prevention of harm.
- Be aware that silence, to the patient of Asian descent, can be interpreted as a sign of respect.
- Provide gender-congruent caregivers as needed or requested. If a gender-congruent caregiver is not available, ask the family for assistance.
- Do not cut or shave a patient's hair without prior discussion with the patient or family.
- Be aware that some cultures (e.g., Chinese, Filipino) discourage bathing for 7 to 10 days after childbirth.
- Bear in mind that some cultures (e.g., Chinese, Japanese, Korean, Hindu) consider the top parts of the body cleaner than the lower parts.
- Be aware that among Hindus and Muslims, the left hand is used for cleaning and the right hand is used for eating and praying.

Data from Galanti, G. A. (2008). *Caring for patients from different cultures* (4th ed.). Philadelphia, PA: University of Pennsylvania; and Giger, J., & Davidhizar, R. E. (2008). *Transcultural nursing: Assessment and intervention* (5th ed.). St Louis, MO: Mosby Elsevier.

motion to perform hygiene care. A patient in traction or a cast or who has an IV line or other device connected to the body needs assistance with hygiene. Patients under the effects of sedation do not have the mental clarity or coordination to perform self-care. Chronic illnesses, such as cardiac disease, cancer, neurological disorders, and certain psychiatric conditions, may exhaust or incapacitate a patient. A weakened grasp resulting from arthritis, stroke, or muscular disorders can prevent a patient from using a toothbrush, washcloth, or comb.

Critical Thinking

Successful critical thinking requires the synthesis of knowledge, experience, information gathered from patients, critical thinking qualities, and intellectual and professional standards. Clinical judgements require you to anticipate the information necessary to analyze data and make decisions regarding patient care. Patients' conditions are always changing, requiring ongoing critical thinking. During assessment, you must consider all contributing factors needed to make a nursing diagnosis (Figure 37-4).

Because hygiene care is so important for patients to feel comfortable, refreshed, and renewed, you should avoid

making hygiene care a simple routine. Instead, integrate knowledge from nursing and other disciplines, previous experiences, and information gathered from patients. In addition, use attributes such as curiosity and humility when designing a plan of care that will meet the patients' hygiene needs. Agency and professional nursing standards and guidelines, such as those from the Registered Nurses' Association of Ontario (RNAO), are used when planning care to meet the patient's hygiene needs.

Nursing Process

❖ Assessment

Important considerations include assessment of the patient's ability to perform self-care, usual hygiene practices, and preferences with special attention to balance, coordination, strength, range of motion, and activity tolerance. Nursing assessment is an ongoing process. It involves all phases of the nursing process, including goal setting, planning, intervention, and evaluation. Not all body regions need to be assessed before administering hygiene; however, routine assessment of a patient's condition is undertaken whenever patient care is provided. For example, during oral care, the condition of the teeth and mucosa can be inspected. If the patient has had a repeated problem (e.g., dry skin or inflamed oral mucosa), then it is important to conduct an assessment before care is administered because variations in technique may be necessary.

Physical Examination

While assisting a patient with personal hygiene, carefully assess the integument, oral cavity structures, and the eyes, ears, and nose (see Chapter 31). Using the skills of inspection and palpation, look for alterations in the integrity and function of tissues. Your assessment also reveals the type and extent of hygiene care required and the need for specialized equipment (e.g. grab bars, tub chair). Special attention should be given to the structures most influenced by hygiene measures. Is the skin intact, especially over bony prominences? Is the skin dry from too much bathing? Are calluses present on the feet, which may benefit from soaking? Is a coating of the tongue present, which necessitates frequent oral care? Over time, your assessment provides the baseline for determining whether hygienic measures maintain or improve the patient's condition.

The Skin. While inspecting the skin, thoroughly examine its colour, texture, thickness, turgor, temperature, and hydration. The skin should be smooth, warm, and supple and have good turgor. Pay special attention to the presence and condition of any lesions (see Chapter 31), and assess for dryness indicated by flaking, redness, scaling, and cracking. Certain common skin problems affect how hygiene is administered (Table 37-2). Assess tattoos and body piercings for potential health risks such as skin irritation and infection, which are the most prevalent associated complications (Deschesnes et al., 2006). Serious complications such as hepatitis B or C, or HIV/AIDS, or even death, can also result from body piercings and tattoos (Hayward & Tindale, 2008). Careful attention should be paid in assessing less obvious or difficult-to-reach skin surfaces, such as under the female patient's breasts, under the male patient's scrotum, or around the female's perineal tissues. Observed skin problems should be documented, explained to the patient, and teaching on proper skin care and specific hygiene techniques should also be discussed with the patient.

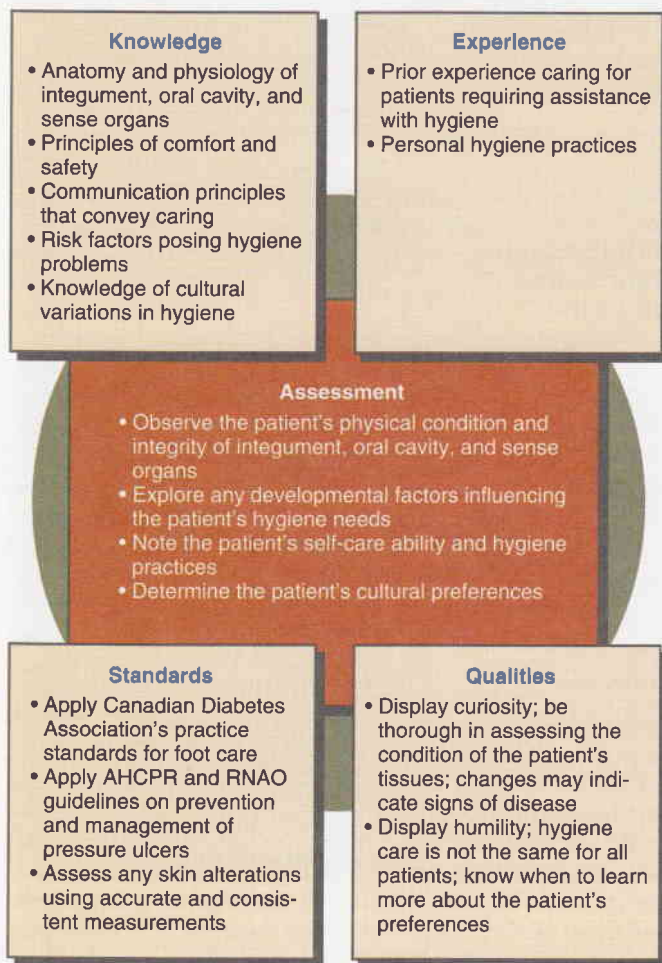


Figure 37-4 Critical thinking model for hygiene assessment. AHCPR, Agency for Health Care Policy and Research; RNAO, Registered Nurses Association of Ontario.

► TABLE 37-2 Common Skin Problems

Characteristics	Implications	Interventions
Dry Skin Flaky, rough texture on exposed areas such as hands, arms, legs, or face	Skin may become infected if epidermal layer is allowed to crack.	Bathing should be less frequent and the skin rinsed of all soap residue, because if left on the skin, soap can cause irritation and skin breakdown. Increase/encourage fluid intake, if permitted. Use a nonallergenic moisturizing cream—to help form a protective barrier and assist with keeping fluid within the skin. Use creams to clean skin that is dry or if patient is allergic to soaps or detergents.
Acne Inflammatory, papulopustular skin eruption, usually involving bacterial breakdown of sebum; appears on face, neck, shoulders, and back	Infected material within pustule can spread if area is squeezed or picked. Permanent scarring can result.	Wash hair and skin thoroughly each day with soap to remove excess oil and prevent secondary infections. Use cosmetics sparingly, as oily cosmetics and creams accumulate in pores and tend to worsen the condition. Use prescribed topical or oral antibiotics.
Skin Rashes Skin eruption that may result from overexposure to sun or moisture or from an allergic reaction (may be flat or raised, localized or systemic, pruritic or nonpruritic)	If skin is continually scratched, inflammation and infection may occur.	Wash the area thoroughly and apply an antiseptic spray or lotion to prevent further itching and aid in the healing process. Apply warm or cold compresses to relieve inflammation, if indicated.
Contact Dermatitis Inflammation of skin characterized by abrupt onset with erythema, pruritus, pain, and appearance of scaly oozing lesions (seen on face, neck, hands, forearms, and genitalia)	Dermatitis is often difficult to eliminate because the person is usually in continual contact with the substance causing the skin reaction, and it may be hard to identify this substance.	Avoid causative agents (e.g., cleansers and soaps).
Psoriasis Noncontagious, chronic skin condition characterized by an abnormal growth of keratinocytes (a type of skin cell) and an inflammatory reaction that results in the formation of thick, silvery, scaly, inflamed patches of skin; commonly seen on the scalp, knees, elbows, and chest	The cause of psoriasis is unknown, and no cure exists. It is often difficult to diagnosis as it has similar symptoms to eczema and atopic dermatitis.	Treatment options are aimed at reducing the extent and severity of the condition and improving quality of life. The patient should avoid trigger agents such as smoking, stress, excessive alcohol, and skin injury (e.g., sunburn).
Abrasion Scraping or rubbing away of epidermis that may result in localized bleeding and later weeping of serous fluid	Infection occurs easily because of the loss of this protective skin layer.	Trim your fingernails and do not wear jewellery when providing patient care. Cleanse area and dry thoroughly and gently. Observe for retained moisture in dressings or bandages—excess moisture can increase the risk of infection. Lift—do not pull—when transferring or repositioning a patient (see Chapter 45).

► BOX 37-2 Risk Factors for Skin Impairment

Immobilization

When restricted from moving freely, patients' dependent body parts are exposed to pressure, reducing circulation to the affected body parts. You should know which patients require assistance to turn and reposition.

Reduced Sensation

Patients with paralysis, circulatory insufficiency, or local nerve damage are unable to sense an injury to the skin. While bathing a patient, assess the status of sensory nerve function by checking for pain, tactile sensation, and temperature sensation.

Nutrition and Hydration Alterations

Patients with limited caloric and protein intake can develop thinner, less elastic skin, with a loss of subcutaneous tissue. This can result in impaired delayed wound healing.

Secretions and Excretions on the Skin

Moisture on the skin's surface serves as a medium for bacterial growth and can cause irritation, soften epidermal cells, and lead to skin breakdown. The presence of perspiration, urine, fecal material, or wound drainage on the skin can also result in breakdown or infection, or both.

Vascular Insufficiency

Inadequate arterial supply to tissues and impaired venous return decrease the circulation to the extremities. Inadequate blood flow can cause ischemia and tissue breakdown. The risk of infection also exists because the delivery of nutrients, oxygen, and white blood cells to injured tissues is inadequate.

External Devices

An external device applied to or around the skin exerts pressure and friction on the skin. Assess all surfaces exposed to casts, cloth restraints, bandages and dressings, tubing, or orthopedic braces.

Certain conditions place patients at risk for impaired skin integrity (Box 37-2). You must be particularly alert when assessing patients with reduced sensation, vascular insufficiency, or immobility. Make sure to assess both extremities and assist patients in turning so that skin surfaces can be fully viewed. The development of pressure ulcers is a common complication that can extend hospital stays and threaten the well-being of long-term care patients. Tools such as the Braden Scale (Gulanick & Myers, 2007) are available to determine those patients who may be at risk for impaired skin integrity. When caring for patients with darkly pigmented skin, you should be aware of assessment techniques and skin characteristics unique to highly pigmented skin (Box 37-3).

The Feet and Nails. When assessing the feet, perform a thorough examination of all skin surfaces, including the areas between the toes and over the soles of the feet. The heels, soles, sides of the feet, and "knuckles" of the toes are prone to irritation from poorly fitting shoes. In addition, inspect the shape and size of the toes, as well as the shape of the foot. The toes are normally straight and flat. The feet should be in straight alignment with the ankle and tibia. Inspect the feet for lesions and note areas of dryness, inflammation, or cracking.

Assess the patient's gait. Painful foot disorders or decreased sensation can cause limping or an unnatural gait. Inquire whether the patient has foot discomfort and determine factors that aggravate the pain. Foot problems may result from bone

► BOX 37-3 Skin Assessment and Implications for Practice

Identifying changes in skin colour is important in evaluating patients' risks for skin breakdown and pressure ulcers (see Chapter 46). When a patient's natural skin contains more melanin, it is more difficult to determine hyperemia and cyanosis. Some hyperpigmentation areas are normal, such as Mongolian spots, which may be on the sacrum of African, Aboriginal, and Asian patients. These areas should not be confused with skin colour changes such as hyperemia or cyanosis.

Implications for Practice

For dark-skinned patients, assess baseline skin tone by asking the patient or family to point out an area of baseline skin colour for that person. Assess the oral mucosa, over the cheekbones, and conjunctivae in the dark-skinned patient, and the nail beds and lips in light-skinned patients.

Assess localized skin changes:

- Colour darker than surrounding skin colour; purplish, bluish (cyanosis), eggplant
- Taut skin
- Shiny skin
- Induration (hardening of the tissues)
- Use natural light sources when possible because fluorescent light can give the skin a bluish tone
- Examine the body sites with the least amount of melanin for underlying skin colour identification.

Assess for edema (non-pitting, pitting) (see Chapter 31)

Assess skin temperature, using the back of your hand; if the patient's condition permits, do not use gloves when doing this assessment:

- Initially may feel warmer than surrounding skin
- Subsequently may feel cooler than surrounding skin

Data from Estes, M. E., & Buck, M. (2008). *Health assessment and physical assessment* (1st Cdn. ed.). Toronto: Thomson Nelson; MacDonald-Jenkins, J. (2009b). Skin, hair, and nails. In C. Jarvis, A. Browne, J. MacDonald-Jenkins, and M. Luctkar-Flude (Eds.), *Physical examination and health assessment* (1st Canadian ed., pp. 295, 315). Toronto: Elsevier Canada; and Stephen, T. C. (2010). Assessment of integumentary function. In R. A. Day, P. Paul, B. Williams, S. C. Smeltzer, and B. G. Bare (Eds.), *Brunner & Suddarth's textbook of Canadian medical-surgical nursing* (2nd ed.) (pp. 1818–1835). Philadelphia, PA: Lippincott Williams & Wilkins.

or muscular alterations or wearing poor-fitting footwear, rather than skin disorders.

Patients with peripheral vascular disease, diabetes mellitus, and other diseases that affect peripheral circulation and sensation should be assessed for the adequacy of circulation to the feet (see Chapter 31). Inspection and daily foot care can help prevent the development of a foot ulcer. Foot ulcerations are a predisposing factor for lower extremity amputations in individuals with diabetes mellitus (Ogrin & McLaren, 2010).

Palpation of the dorsalis pedis and posterior tibial pulses indicates whether adequate blood flow is reaching peripheral tissues. Edema and changes in skin colour, texture, and temperature can indicate whether patients require special hygiene care. Individuals with diabetes mellitus should also be assessed for **neuropathy**—degeneration of the peripheral nerves characterized by a loss of sensation. Assess patients' sensation to light touch, pain, and temperature.

Inspect the condition of the fingernails and toenails, looking for lesions, dryness, inflammation, and cracking (Table 37-3). The nail is surrounded by a cuticle, which slowly grows over the nail and must be regularly pushed back. The skin around

► **TABLE 37-3** Common Foot and Nail Problems

Characteristics	Implications	Interventions
Callus A thickened portion of the epidermis consisting of a mass of horny, keratotic cells. It is usually flat, painless, and found on the undersurface of the foot or on the palm of the hand. Caused by local friction or pressure.	The condition may cause discomfort when wearing tight shoes.	Advise the patient to wear gloves when using tools or objects that may create friction on palmar surfaces, and to wear soft-soled shoes with insoles. Soak callus in warm water and magnesium sulphate (Epsom salts) to soften the cell layers. Apply cream or lotion to reduce reformation. Encourage the patient to see a podiatrist (ensure that the patient is aware of the associated cost).
Keratoses (corn) Corns are caused by chronic friction and pressure from ill-fitting or loose shoes. It is seen mainly on or between toes or over a bony prominence. A corn is usually cone shaped, round, and raised. Soft corns are macerated.	The conical shape compresses the underlying dermis, making it thin and tender. The pain worsens when tight shoes are worn. Corns can become soft and macerated by perspiration. The patient may suffer an alteration in gait resulting from pain.	Surgical removal may be necessary, depending on the severity of pain and size of the corn. Avoid the use of oval corn pads, which can increase pressure on toes and reduce circulation. Use warm water soaks to soften the corns before gentle rubbing with a callus file or pumice stone (consult with physician or podiatrist). Wider and softer shoes are suggested.
Plantar Wart A fungating lesion caused by the papillomavirus that appears on the sole of foot.	Warts may be contagious, are painful, and can make walking difficult.	Treatment ordered may include applications of salicylic acid, electrodesiccation (burning with electrical spark), or freezing with solid carbon dioxide.
Athlete's Foot (Tinea Pedis) A fungal infection of the foot; scaliness and cracking of skin occurs between the toes and on the soles of feet. Small blisters containing fluid may appear. The problem can be caused by wearing constricting footwear.	Athlete's foot can spread to other body parts, especially the hands. It is contagious and frequently recurs.	Feet should be well ventilated. Drying feet well after bathing and applying powder helps to prevent infection. Wearing clean socks or stockings reduces the incidence. The physician or nurse practitioner may prescribe antifungal topical applications.
Ingrown Nail An ingrown toenail or fingernail grows inward into the soft tissue around nail. An ingrown nail often results from improper nail trimming.	Ingrown nails can cause localized pain when pressure is applied and can lead to infection.	Treatment is frequent hot soaks in an antiseptic solution and removal of the portion of nail that has grown into skin. Instruct the patient regarding proper nail-trimming techniques, and provide a referral to a podiatrist. (Ensure that the patient is aware of the associated cost.)
Ram's Horn Nail An unusually long, curved, thickened nail.	Attempts to cut ram's horn nails may result in damage to the nail bed with an increased risk of infection.	Refer the patient to a podiatrist. (Ensure that the patient is aware of the associated cost.)
Paronychia Inflammation of tissue surrounding the nail, after a hangnail or other injury. It occurs in individuals who frequently have their hands in water and is common in patients with diabetes.	Infection	Treatment can include hot compresses or soaks, or topical or oral antibiotics. Can be prevented by careful manicuring.
Foot Odour Results from excess perspiration, promoting microorganism growth.	The condition may cause discomfort because of excess perspiration and odour, and increases patients' risk for infection.	Frequent washing, using foot deodorants and powders, and wearing clean footwear prevents or reduces the problem.

the nail beds and cuticles should be smooth and without inflammation. You should ask women whether they frequently polish their nails and use polish remover because chemicals in these products can cause excessive nail dryness and discolouration. Disease can change the shape and curvature of the nails. Inflammatory lesions and fungus of the nail bed can cause thickened, horny nails, which can separate from the nail bed.

The Oral Cavity. Inspect all areas of the oral cavity carefully for colour, hydration, texture, and lesions (see Chapter 31). Patients who do not follow regular oral hygiene practices may have receding gum tissue, gingivitis, a coated tongue, discoloured teeth (particularly along the gum margins), dental caries, missing teeth, and **halitosis** (bad breath). Localized pain and infection are common symptoms of periodontal disease and certain tooth disorders.

Some patients in acute care settings require a complete oral assessment. The identification of risks for infection and other conditions can suggest the type and frequency of oral care. Proper oral care has been shown to decrease the risk of aspiration and nosocomial infections in ventilated patients (Mori et al., 2006). Ebersole et al. (2008) posit that Gram-negative bacteria (e.g., *Pseudomonas aeruginosa*) found in dental plaque can result in pneumonia in hospitalized older adults. It is especially important to examine the oral cavity of patients receiving radiation or chemotherapy. Both treatments can reduce the amount of saliva, resulting in drying and **stomatitis** (inflammation of the oral mucosal tissues). The assessment serves as a basis for preventive care for patients as they undergo treatment.

The Hair. Before performing hair care, assess the condition of the hair and scalp. Healthy hair is clean, shiny, and untangled; the scalp is free of lesions. The hair of dark-skinned patients is usually thicker, drier, and curlier than that of lighter-skinned patients. Table 37-4 summarizes hair and scalp problems that may be identified during the assessment. In community and home care settings, it is particularly important to inspect the hair for pediculosis capitis (head lice) so that the appropriate treatment can be provided. If head lice are suspected, guard against self-infestations by handwashing and using gloves or tongue blades to inspect the patient's hair. A loss of hair (**alopecia**) can result from the effects of chemotherapy medications, hormonal changes, or improper hair care practices. Patients at risk for scalp problems are those who have experienced head trauma and those who practise poor hygiene.

The Eyes, Ears, and Nose. Examine the condition and function of the eyes, ears, and nose (see Chapter 31). Normally the eyes are free of infection and irritation. The sclerae are visible anteriorly as the white portion of the eye. The conjunctivae (the lining of the eyelids) are clear, pink, and without inflammation. The eyelid margins are in close approximation with the eyeball, and the lashes are turned outward. The lid margins are without inflammation, drainage, or lesions. The eyebrows are symmetrical.

Determine whether the patient wears contact lenses. This is especially significant for patients who enter hospitals or other agencies unresponsive or in a confused state. To determine whether a contact lens is present, stand to the side of the patient's eye and observe the cornea for the presence of a soft or rigid lens; if you do not see one, observe the sclera to detect whether a contact lens has shifted off the patient's cornea. An undetected lens can cause severe corneal injury if left in place too long.

Inspect the external ear structures (auricle, helix, and earlobe), and use an otoscope to inspect the external auditory canal and tympanic membrane. While performing hygiene measures, you are most concerned with noting the presence of accumulated **cerumen** or drainage in the ear canal, local inflammation, tenderness on palpation, or the patient's report of pain (see Chapter 31).

Inspect the nares for signs of inflammation, discharge, lesions, edema, and deformity (see Chapter 31). The nasal mucosa is normally pink and clear and has little or no discharge. A clear, watery discharge may be the result of allergies. If patients have any form of tubing exiting the nose (e.g., nasogastric tube), inspect the naris surfaces that come in contact with the tubing for tissue sloughing, localized tenderness, inflammation, and bleeding.

Developmental Changes

The normal process of aging influences the condition of body tissues and structures and, thus, the manner in which hygiene measures are performed. Chapter 47 addresses the changes in hearing, vision, and olfaction across the lifespan as a result of growth and development.

The Skin. Neonates' skin is relatively immature at birth. The epidermis and dermis are loosely bound together, and the skin is very thin. Friction against the skin layers can cause bruising, so neonates must be handled carefully during bathing. Any break in the skin can easily lead to infection.

Toddlers' skin layers are more tightly bound together. Thus, children have a greater resistance to infection and skin irritation. However, because of children's active play and the absence of established hygiene habits, greater attention is needed from parents and caregivers to provide thorough hygiene and to begin teaching good hygiene habits.

During adolescence, the growth and maturation of the integument increases. In girls, estrogen secretion causes the skin to become soft, smooth, and thicker, with increased vascularity. In boys, male hormones produce an increased thickness of the skin with some darkening in colour. Sebaceous glands become more active, predisposing adolescents to **acne**. Eccrine and apocrine sweat glands become fully functional during puberty. Adolescents usually begin to use deodorants, and more frequent bathing and shampooing become necessary to reduce body odours and eliminate oily hair. Sweating is usually more pronounced in boys.

The condition of adults' skin depends on hygiene practices and exposure to environmental irritants. Normally, the skin is elastic, well hydrated, firm, and smooth. When adults practise frequent bathing or are exposed to an environment with low humidity, the skin can become very dry and flaky.

With aging, the skin loses its resiliency and moisture, and sebaceous and sweat glands become less active. The epithelium thins, and elastic collagen fibres shrink, making the skin fragile and subject to bruising and breaking. These changes warrant caution when turning and repositioning older adults (Meiner & Lueckenotte, 2006). Typically, older adults' skin becomes drier and wrinkled. Because the skin may be excessively dry, older adults should avoid bathing daily and using very hot water or harsh soaps.

The Feet and Nails. When we stand, the feet provide support and absorb shock. With aging, they begin to show signs of wear and tear. This may occur earlier if individuals have failed to wear comfortable, supportive footwear. The cushioning layer of fat on the soles of the feet becomes thin.

► **TABLE 37-4** Problems of Head and Body Hair and Scalp

Characteristics	Implications	Interventions
Dandruff Scaling of the scalp is accompanied by itching. In severe cases, dandruff can be found on eyebrows.	Dandruff causes individuals embarrassment and if it enters the eyes, conjunctivitis may develop.	Shampoo regularly with a medicated shampoo. In severe cases, obtain a physician's advice.
Ticks Small, grey-brown parasites that burrow into the skin and suck the blood.	Ticks transmit several diseases to individuals. The most common are Rocky Mountain spotted fever, tularemia, and Lyme disease.	Do not pull ticks quickly from the skin because their sucking apparatus remains and may cause infection. Ticks can be removed slowly with tweezers.
Pediculosis Capitis (Head Lice) Head lice require a source of human blood to survive. Transmission is by direct contact (e.g., head to head). The parasite is found near the scalp attached to hair strands. Eggs look like oval particles, similar to dandruff. Bites or pustules may be observed behind the ears and at the hairline. Itching at the hairline is the most common symptom.	Contacts of the patients (e.g., family members and classmates) should be examined and treated. Although no current evidence exists of transmission by shared articles, families may wish to wash bedding and combs in hot water. Dry-cleaning or storing items in occlusive plastic bags for approximately two weeks is also effective (Canadian Paediatric Society [CPS], 2008).	Check the entire scalp. Use a medicated shampoo to eliminate lice. Follow the product directions carefully; a repeat application is required 7–10 days later to ensure that surviving eggs are destroyed. Seek physician advice if treatment is ineffective; a new medication may be required for effective chemical eradication. Some products can cause neurotoxicity and should not be used with children under six years of age. Caution is advised against use of products containing lindane. This product has been withdrawn for use in some countries. Use a fine-toothed comb to assist with the manual removal of nits (the empty eggshell) and lice.
Pediculosis Corporis (Body Lice) Body lice differ from head lice in that they tend to cling to clothing and may not be easily seen. They suck blood and lay eggs on clothing and furniture.	The patient itches constantly. Scratches seen on the skin may become infected. Hemorrhagic spots may appear on skin where lice are sucking blood.	Ask the patient to bathe or shower thoroughly. After the skin is dried, apply a recommended pediculicide lotion. After 8–12 hours, have the patient take another bath or shower. Bag infested clothing or linen until laundered in hot water. Vacuum rooms thoroughly and throw away the bag after completion.
Pediculosis Pubis (Crab Lice) Crab lice parasites are found in pubic hair. Crab lice are greyish white with red legs.	Lice may be spread via bed linen, clothing, furniture, or via sexual contact.	Cleanse as for body lice. Treatment of sexual partners is recommended.
Hair Loss (Alopecia) Alopecia occurs in individuals of all races. Balding patches are seen at the periphery of the hairline. Hair becomes brittle and broken. The condition can be caused by genetics, the use of hair curlers or hair picks, tight braiding, and some medications.	Patches of uneven hair growth and loss alter the patient's appearance and affect self-image.	Advise the patient to stop any hair care practices that might be further damaging the hair.

Chronic foot problems are a common result of poor foot care, improperly fitting footwear, aging, and systemic disease. Older adults often have dry feet because of a decrease in sebaceous gland secretion, dehydration of epidermal cells, and poor condition of footwear. Callus formation and decreased sensation place the patient at a high risk for the development of foot ulcers (Senthuran, 2010). Painful feet can be the result of congenital deformities, weak structure, injuries, and diseases

such as diabetes, rheumatoid arthritis, or osteoarthritis. After 55 years of age, arthritis is a common cause of changes in the feet. Additional common foot problems are hammer toes, hallux valgus (bunions), corns, and ingrown toenails (Senthuran, 2010).

Fungal infections can occur under toenails, causing dark yellow streaks or total discolouration. The nails can also become opaque, scaly, and hypertrophied. If foot or nail

problems stay unresolved, patients can easily become disabled. You must apply knowledge of typical changes in the feet and nails when anticipating the type of hygiene that patients will require.

The Oral Cavity. Infants begin teething at approximately six to eight months of age (Wilson, 2007). The first permanent (secondary) teeth erupt at about six years of age. From adolescence, when all of the permanent teeth are in place, through middle adulthood, the teeth and gums remain healthy if individuals avoid fermentable carbohydrates and sticky sweets. Regular dental care and hygiene practices such as brushing and flossing help to prevent caries and periodontal disease.

As individuals grow older, numerous factors can result in poor oral care. These include age-related changes of the mouth, chronic disease such as diabetes, physical disabilities involving hand grasp or strength affecting the ability to perform oral care, lack of attention to oral care, and prescribed medications that affect the buccal (oral) mucosa. Aging teeth become brittle, drier, and darker. Teeth can become uneven, jagged, and fractured. Gums lose vascularity and tissue elasticity, which can cause dentures to fit poorly. Many older adults are edentulous and wear complete or partial dentures. It is important to determine whether older patients wear dentures and the condition of underlying supportive gum tissue.

The Eyes, Ears, and Nose. Although the structure of the eyes does not have marked developmental changes, altered visual acuity can occur at several points during the aging process; for example, when children start school or when patients reach middle age, visual acuity may change. As patients age, they are also at risk for changes in visual clarity (e.g., caused by glaucoma or cataracts) and visual field losses (e.g., caused by macular degeneration or glaucoma).

Structures of the ears do not change as patients age; however, changes in hearing acuity or balance may occur with aging. In young children, changes in hearing acuity may result from a foreign object being placed in the ear—this may be a temporary change, resolved once the object is removed. Changes may also result from repeated ear infections or exposure to loud noise, such as when children listen to loud music on headphones.

Older adults may have changes in the structure and function of the small bones in the inner ear that affect hearing acuity. Aging may result in increased cerumen production, which can also impede hearing acuity. In addition, the movement of fluid through the semicircular canals may change with age, and patients may experience positional dizziness or balance problems.

Although changes in the sense of smell can occur at any time, they seem to be more common in older adults. These changes may also affect taste and patients' appetite.

New and acute changes in the structure and function of the eyes, ears, and nose must be fully assessed and evaluated. Timely evaluation of these changes may confirm that they are age related or identify other illnesses.

Use of Sensory Aids

When patients wear eyeglasses, contact lenses, artificial eyes, or hearing aids, assess their knowledge and ask them to describe the methods that are used for routine care (Box 37-4). Compare the information gathered with the proper care technique for these devices. Any differences between patient practice and standard practice may indicate a need for patient education.

► BOX 37-4

Assessing a Patient's Use of Sensory Aids

Eyeglasses

- Ask about purpose for wearing glasses (e.g., reading, distance, or both)
- Ask about methods used to clean glasses
- Ask about presence of symptoms (e.g., blurred vision, photophobia, headaches, irritation)

Contact Lenses

- Determine type of lens worn
- Ask about frequency and duration of time lenses are worn (including sleep time)
- Ask about presence of symptoms (e.g., burning, excess tearing, redness, irritation, swelling, or sensitivity to light)
- Ask about techniques used by the patient to cleanse, store, insert, and remove lenses
- Ask about use of eye drops or ointments
- Determine whether patient has an emergency identification bracelet or card that alerts others to remove patient's lenses in case of emergency

Artificial Eye

- Ask about method used to insert and remove eye
- Ask about method for cleansing eye
- Ask about presence of symptoms (e.g., drainage, inflammation, or pain involving the orbit)

Hearing Aid

- Ask about type of aid worn
- Ask about methods used to cleanse aid
- Ask about patient's ability to change battery and adjust hearing aid volume

Self-Care Ability

Patients with physical or cognitive impairments need assistance with all or some aspects of personal hygiene. Assessment of patients' physical and cognitive statuses determines specifically which aspects of hygiene care can be performed independently, which require some assistance, and which require total assistance.

The assessment must include the measurement of patients' muscle strength, flexibility and dexterity, balance, coordination, and activity tolerance—these qualities are needed to perform activities such as bathing, brushing teeth, and bending over to inspect the feet. The degree of assistance needed by patients during hygiene care may also depend on vision, their ability to sit without support, their hand grasp strength, the range of motion in their extremities, or the presence of equipment such as an IV line, dressings, or traction. Painful conditions of the upper extremities pose special problems. Assess self-care ability by asking patients to perform activities such as brushing their teeth or combing their hair. Observe them carefully and note whether the patients can perform the task thoroughly and correctly (Figure 37-5).

When a patient has self-care limitations, part of the assessment is to determine whether family or friends are available to assist. Assisting with hygiene measures can at times be unpleasant, so the assessment should include how the family members assist, how often this assistance is provided, and what their feelings are about being a caregiver. In addition,



Figure 37-5 Observe the patient brushing teeth. Observation allows you to determine how much assistance the patient may need.

assess the home environment and its influence on the patient's hygiene practices. Does the home environment contain barriers that may affect the patient's self-care abilities? Water faucets that are too tight to easily adjust, bathtubs with high sides, and a bathroom too small to fit a wheelchair or walker in front of a sink are a few examples.

Hygiene Practices

An assessment of hygiene practices reveals a patient's grooming preferences. For example, a patient may choose to groom the hair in a certain style or to trim nails a certain way. When a patient has a physical disability, special precautions may be needed to perform grooming without injury. Asking the patient to assist or teach how to perform preferred grooming practices gives the patient a greater sense of independence and helps you to avoid causing the patient discomfort or injury.

Cultural Factors

A patient's cultural background is an influential factor when determining hygiene needs. Culture plays a role not only in hygiene practices and preferences but also in sensitivity regarding personal space (see Chapter 9). For example, some patients may view tasks associated with closeness and touch as being offensive or impolite. Ask patients what would make them feel most comfortable during a bath. Instead of a full bath, perhaps a patient would prefer only a partial bath, with a family member performing the bathing of private body areas. The patient may also defer part of the hygiene care. If, in your judgement, hygiene is critical to prevent developing or worsening problems, such as skin breakdown, you must take the time to understand the patient's concerns and negotiate a mutually satisfactory solution to the problem.

Patients at Risk for Hygiene Problems

Some patients present risks that require more attentive and rigorous hygiene care (Table 37-5). These risks may result from side effects of medications, a lack of knowledge, an inability to perform hygiene, or a physical condition that potentially injures the skin or other structures. An immobilized patient who has a fever, for example, requires more frequent bathing to minimize perspiration on the skin, and more frequent turning and positioning to reduce the risk of skin breakdown.

Anticipate whether a patient is predisposed to such risks and follow through with a complete assessment. For example, if a patient is receiving chemotherapy, the treatment has a risk of destroying the normal flora in the mouth, allowing for the overgrowth of opportunistic bacteria. Therefore, the oral examination should be more thorough and detailed, involving all surfaces of the tongue and mucosa. If a patient is diaphoretic, special attention should be given to body areas such as underneath the breasts and the perineal area, where moisture may collect and irritate skin surfaces. You should anticipate problems created by these risks and provide appropriate preventive care. Your assessment should include a review of the patient's medical and surgical histories, medications, and specific risk factors.

Special Considerations in Hygiene Assessment

Depending on the type of hygiene you are planning to provide, you should conduct certain focused assessments. Before giving foot care, you should assess the type of footwear worn by a patient. Children or young adults who frequently fail to wear socks may have excess perspiration that promotes fungal growth. Tight or poorly fitting shoes, socks, garters, or knee-high nylon stockings may cause skin irritation and interfere with circulation to the feet. You should also assess whether patients wear clean footwear daily because repeated use of soiled footwear can lead to infection. If patients have diabetes mellitus or another peripheral vascular disease, it is extremely important that they wear appropriate footwear. Extra-wide and extra-deep shoes accommodate bunions or hammer toes. Cushioned inner soles help redistribute pressure on the metatarsal head. Patients may need to be referred to a podiatrist and orthotic footwear specialist.

It is also important to assess patients' eating patterns before providing oral care. Ask patients whether problems are noted with chewing, swallowing, or the fit of their dentures, if any. Patients may have changed the type of food in their diet as a result of chewing difficulties. The presence of an ulcer or irritation may impair chewing and cause patients to avoid eating. This is common in older adults with poorly fitting dentures.

Patient Expectations

As is the case in any nursing assessment, it is important to know what patients expect from nursing care. For hygiene care, patients may simply expect to have hygiene preferences and practices applied in the health care setting. You can assess patients' expectations by asking questions such as "To make you most comfortable and feeling at home, how can I best perform your bath and personal care?" or "How can we help you care for your teeth, nails, and hair, now that you are at home?"

Understanding your patients' expectations and applying them in practice is important in establishing a caring relationship. Truly individualizing hygiene care shows respect for

► TABLE 37-5 Health Risks and Implications for Hygiene

Risks	Hygiene Implications
Oral Problems Inability to use upper extremities due to paralysis, weakness, or restriction (e.g., cast or dressing) Dehydration, inability to take fluids or food by mouth Presence of nasogastric or oxygen tubes; mouth breathers Chemotherapeutic drugs Other medications (antihistamines) Over-the-counter lozenges, cough drops, antacids, and chewable vitamins Radiation therapy to head and neck Oral surgery, trauma to mouth, placement of an oral airway Immunosuppression; altered blood clotting Diabetes mellitus	Patient lacks upper extremity strength or dexterity needed to brush teeth (Miller, 2009). Dehydration causes excess drying and fragility of the mucosa, and increases the accumulation of secretions on the tongue and gums. These cause drying of the mucosa. Drugs kill rapidly multiplying cells, including normal cells lining the oral cavity. Ulcers and inflammation can develop. Can cause a decrease in saliva production, which leads to thicker mucus and dryness of the oral mucosa (xerostomia). Medications may contain large amounts of sugar. Repeated use increases sugar or acid content in mouth. Radiation therapy decreases the function of the salivary glands, which can contribute to stomatitis (Cummings-Winfield & Olson, 2010). These cause trauma to the oral cavity with swelling, ulcerations, inflammation, and bleeding. These conditions predispose to inflammation and bleeding gums. Patients with diabetes are prone to dryness of the mouth, gingivitis, periodontal disease, and tooth loss.
Skin Problems Immobilization Reduced sensation due to stroke, spinal cord injury, diabetes, local nerve damage Limited protein or caloric intake and reduced hydration (e.g., caused by fever, burns, gastrointestinal alterations, poorly fitting dentures) Excessive secretions or excretions on the skin from perspiration, urine, watery fecal material, and wound drainage Presence of external devices (e.g., casts, restraint, bandage, dressing) Vascular insufficiency	Dependent body parts are exposed to pressure from underlying surfaces. The inability to turn or change position increases the risk for pressure ulcers. Patient does not receive the normal transmission of nerve impulses when excessive heat or cold, pressure, friction, or chemical irritants are applied to skin. Limited caloric and protein intakes predispose to impaired tissue synthesis. The skin becomes thinner, less elastic, and smoother, with a loss of subcutaneous tissue. Poor wound healing may result. Reduced hydration impairs skin turgor. Moisture is a medium for bacterial growth and can cause local skin irritation, softening of epidermal cells, and skin maceration. A device can exert pressure or friction against the skin's surface. Arterial blood supply to tissues is inadequate, or venous return is impaired, causing decreased circulation to the extremities. Tissue ischemia and breakdown may occur. The risk for infection is high.
Foot Problems Inability to bend over or see clearly	Patient is unable to fully visualize the entire surface of each foot, impairing his or her ability to adequately assess the condition of skin and nails.
Eye Care Problems Reduced dexterity and hand coordination	Physical limitations create an inability to safely insert or remove contact lenses.

your patients' needs. As you learn what each patient expects, this information can be incorporated into the individual's plan of care (see the Planning section later).

❖ Nursing Diagnosis

Your assessment reveals the condition of the skin, oral cavity, and other tissues, as well as a patient's need for and ability to meet personal hygiene needs. As you review all data gathered, think about your knowledge pertaining to pre-existing conditions, and then look for clusters of data suggesting a problem trend. For example, an older adult with degenerative arthritis can present with pain in the joints, weakness, mobility limitations in the dominant hand, and a generally unkempt

appearance. A closer review of assessment data reveals defining characteristics of an inability to wash body parts and difficulty turning and regulating a water faucet. The nursing diagnosis of *bathing/hygiene self-care deficit* is supported and becomes part of the plan of care. The accurate selection of nursing diagnoses requires critical thinking to identify actual or potential health problems. Assessment activities must be thorough in identifying all appropriate defining characteristics so that an accurate diagnosis can be made (Box 37-5).

The focus of nursing interventions depends on whether a patient has an actual alteration (e.g., impaired tissue integrity) or is at risk for a problem (e.g., risk for impaired oral mucous membrane). The patient with an actual alteration requires extensive hygiene care, which is often more thorough than

BOX 37-5 NURSING DIAGNOSTIC PROCESS

Assessment Activities	Defining Characteristics	Nursing Diagnosis
Observe patient's attempt to bathe self either in bed or at bathroom sink. (Note: Be sure positioning does not restrict potential movement.)	Unable to wash body or body parts	Self-care deficit in bathing or hygiene related to upper extremity weakness and generalized fatigue
Assess patient's upper extremity strength, range of motion, and coordination.	Restricted upper extremity range of motion and strength Coordination adequate	
Ask patient about level of fatigue after bathing.	Complains of fatigue and needs to rest after bathing	
Obtain vital signs before and after bathing.	Pulse elevated from 90–110 beats per minute, blood pressure stable, respirations elevated from 16–22 breaths per minute	

routine care. For example, if the patient has skin breakdown, you must initiate care more frequently to keep intact skin surfaces clean and dry and to eliminate factors such as moisture or drainage that can worsen the condition of the skin. You also provide care to promote healing of injured skin surfaces (see Chapter 46). If the patient is at risk for a problem, you institute preventive measures. In the case of risk for impaired oral mucous membranes, you keep the mucosa well hydrated, minimize foods irritating to tissues, and provide cleansing that soothes and reduces tissue inflammation.

The identification of related factors guides in the selection of nursing interventions. Diagnoses of *impaired oral mucous membrane related to malnutrition* and *impaired oral mucous membrane related to chemical trauma* require very different interventions. When malnutrition is a causal factor, you confer with a dietitian for appropriate dietary supplements and incorporate patient education into the plan. When mucosa are injured as a result of chemical trauma from chemotherapy, techniques for cleansing and hydrating inflamed tissues and eliminating sources of irritation are the focus of nursing care. Although many nursing diagnoses associated with hygiene problems are possible, the following are a few of the more common diagnoses:

- *Impaired dentition*
- *Fatigue*
- *Ineffective health maintenance*

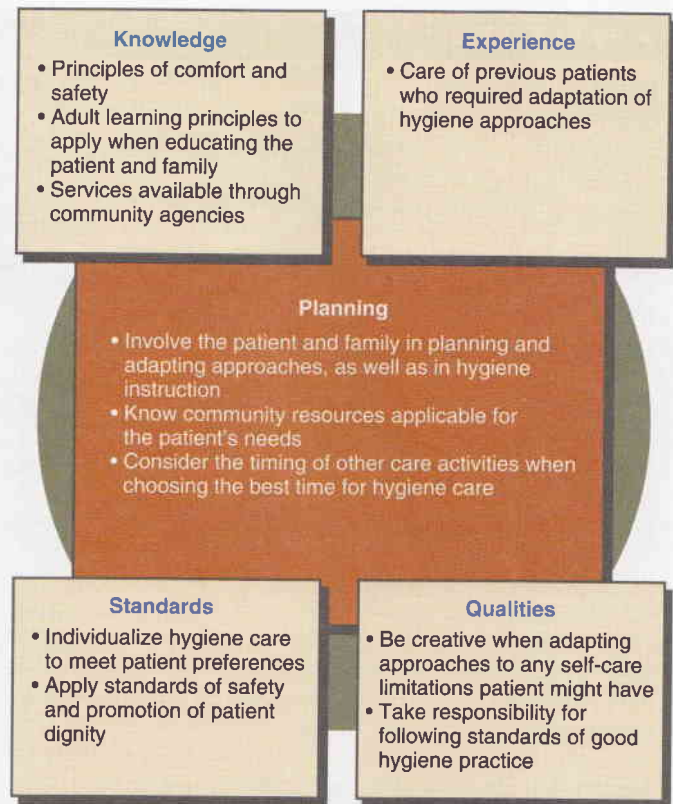


Figure 37-6 Critical thinking model for hygiene planning.

- *Risk for infection*
- *Deficient knowledge about hygiene practices*
- *Impaired physical mobility*
- *Impaired oral mucous membrane*
- *Self-care deficit, bathing/hygiene, dressing/grooming, toileting*
- *Chronic low self-esteem*
- *Risk for impaired skin integrity*
- *Ineffective tissue perfusion*

❖ Planning

During planning, you synthesize information from multiple resources (Figure 37-6). Professional nursing standards and evidence-informed clinical guidelines are especially important to consider when developing a care plan for the patient. For example, the clinical practice guidelines of the Canadian Diabetes Association (2008) offer valuable foot care guidelines for diabetic patients. Critical thinking ensures that the patient's plan of care integrates knowledge about the individual patient, including preferences, health status, equipment needed, assistance available, and previous experience in providing hygiene care. Certain patients have multiple nursing diagnoses. The concept map (Figure 37-7) shows graphically how numerous nursing diagnoses can be interrelated.

Goals and Outcomes

You and the patient work together to identify goals and expected outcomes and to develop an individualized care plan based on the patient's nursing diagnoses (Box 37-6). Goals are established with the patient's self-care abilities and resources in mind and focus on maintaining or improving the condition of the skin and mucosa, oral mucosa, or dental hygiene, for

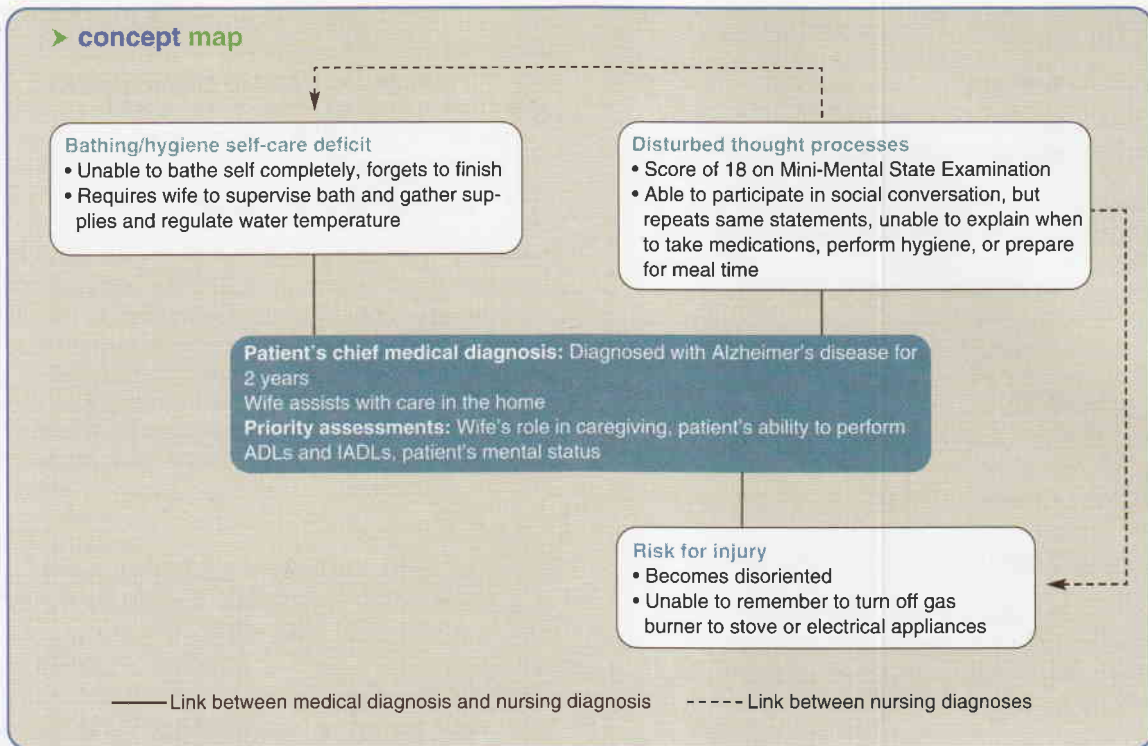


Figure 37-7 Concept map for a patient with Alzheimer's disease and hygiene needs. *ADLs*, Activities of daily living; *IADLs*, instrumental activities of daily living.

> BOX 37-6 NURSING CARE PLAN

Self-Care Deficit: Hygiene (Foot Care) Related to Visual Impairment and Knowledge Deficit

Assessment

Mr. James is a 77-year-old who has had type 1 diabetes mellitus for 30+ years. He was recently admitted to hospital for uncontrolled blood glucose levels. Examination of his feet reveals reddened areas over the bony prominences of the toes and calluses to the soles of the feet and to both heels. Mr. James's toenails are unkempt, yellow, and thickened. He states that he is unable to see well enough to trim his toenails because he has cataracts.

Assessment Activities

Inspection

Inspect the feet for dry, rough skin, fissures, calluses, lesions, blisters, inflammation, edema.

Rationale: Daily inspection is especially important for those patients at an increased risk for developing pressure ulcers. Prevention: Early recognition of risk factors associated with diabetic foot issues.

Inspect the toenails for discoloration, thickness, and any abnormal findings (e.g., ingrown toenails).

Rationale: Monitor for signs of infections, redness, erythema for prevention and early recognition.

Palpation

Palpate the dorsalis pedis and posterior tibial pulses.

Rationale: Decreased circulation due to neuropathy and vascular insufficiency can lead to the development of foot ulcers.

Assess skin temperature and compare bilaterally.

Rationale: Decreased circulation increases patient's risk for development of diabetic foot ulcers.

Findings and Defining Characteristics

Redness over bony prominences of toes
Calluses on soles of feet and heels

Unkempt, yellow, thickened toenails

Pedal pulses weak bilaterally

Feet are cool to touch bilaterally

Continued

► BOX 37-6 NURSING CARE PLAN—cont'd

Assessment Activities

Palpate for edema, tenderness.

Rationale: Bilateral dependent edema occurs with diabetic neuropathy.

Assess sensation.

Rationale: Neuropathy is a major risk factor for the development of foot ulcers.

Assess range of motion.

Protection

Assess type and condition of footwear.

Hygiene

Inquire about present foot care practices.

Inspect feet for odour, cleanliness, excessive dryness or moisture, and the condition of the nails.

Findings and Defining Characteristics

No edema or tenderness

Decreased sensation bilaterally

Range of motion within normal limits

Patient wears ill-fitting shoes that are well worn, have slippery soles, and are approximately 10 years old
Socks are tight fitting around the ankles and have holes on the soles

Mr. James does not have any specific foot care practices, does not use moisturizing lotion, and has never visited a foot care specialist

Excessive dryness
No odour is present
Nails are unkempt, long, thickened, and discoloured

Nursing Diagnosis: Self-care deficit: Hygiene (foot care) related to visual impairment and knowledge deficit.

Planning

Goals (Nursing Outcomes Classification)*

Attain baseline of patient's current knowledge and practices regarding foot hygiene and access to resources.

Increase patient's knowledge on the importance of foot hygiene.

Eliminate underlying cause of redness over bony prominences and calluses.

Patient is able to describe and demonstrate proper technique for foot hygiene.

Nails are clean and well-trimmed.

Intervention (Nursing Interventions Classification)[†]

Assess patient's knowledge and current foot care practices.
Assess patient's ability to perform ADLs and IADLs.

Provide instruction on the need for and the importance of daily inspection of the feet for signs of skin breakdown (e.g., redness, blisters, abrasions, ulcers); friction and calluses from ill-fitting footwear; and daily hygiene.

Encourage patient to wear appropriate, well-fitting shoes and socks that are free from damage and not constricting.

Demonstrate appropriate technique for foot inspection, hygiene, and application of moisturizing lotion.

Toenails should be cut straight across to prevent ingrown toenails. Refer patient to foot specialist for nail care if necessary.

*Outcome classification labels from Moorhead, S., Johnson, M., Maas, M. L., & Swanson, E. (Eds.). (2008). *Nursing outcomes classification (NOC)* (4th ed.). St Louis, MO: Mosby.

[†]Intervention classification labels from Bulechek, G. M., Butcher, H. K., & McCloskey Dochterman, J. (Eds.). (2008). *Nursing interventions classification (NIC)* (5th ed.). St Louis, MO: Mosby Elsevier.

Evaluation

Patient's foot hygiene practices have improved. Feet are clean, skin integrity is maintained, feet are free from injury, and there is a decrease in dryness. Patient is seeing a foot care specialist every 3 to 4 weeks for nail care, callus removal, and foot assessment. Appropriate, well-fitting footwear is worn.

example. Outcomes should be appropriate, realistic, measurable, and achievable within patient limitations.

When providing for patient hygiene, you care for a variety of patients with different self-care abilities and needs. For example, for a patient who has hemiparesis after a cerebral vascular accident, you and the patient might develop the following goal: "Patient's musculoskeletal system remains free of breakdown or contractures." A series of realistic individualized

expected outcomes would then be established to assist the patient in meeting this goal. These outcomes may include the following:

- Patient's skin is clean, dry, and intact without signs of inflammation.
- Patient's skin remains elastic and well hydrated.
- Patient's range of joint motion remains within normal limits on both affected and unaffected sides.

Setting Priorities

The patient's condition influences the plan for delivering hygiene. A seriously ill patient usually needs a daily bath because body secretions accumulate and can lead to skin breakdown. An older patient at home may require a visit from a home care aide to assist with a tub bath. Patients who are normally inactive during the day and have skin that tends to be dry may need to bathe only twice a week. You must plan for necessary assistance for patients who are weakened or possess poor coordination. For example, a patient who has hemiparesis and has difficulty getting out of the tub should have a tub chair, handrails, or extra personnel available for help.

Timing is also important in planning hygiene. Being interrupted in the middle of a bath to undergo a diagnostic procedure can frustrate and embarrass a patient. After extensive diagnostic tests (e.g., a stress test), it may be best to delay hygiene and allow a patient to rest.

Continuity of Care

It is important to plan for care throughout the hospital stay, from admission to discharge, whether to a rehabilitation facility or back home. When a patient needs assistance as a result of a self-care limitation, the family becomes a valuable resource. Family members can usually assist with hygiene measures but may need support and guidance in adapting techniques to fit patient limitations. You must be aware of equipment and procedures that were used while the patient was in the hospital or facility so that the patient and family are knowledgeable about the care, have the skill needed to provide the care, and have access to necessary equipment. In addition, various community resources may be needed. For example, if you are involved in the care of a homeless patient, you may need to be aware of the location of clothing distribution centres for basic hygiene supplies or a shelter where bathing facilities are available. Forming partnerships with social workers or staff in local area churches and schools can assist in ensuring that patients have the resources they need to maintain hygiene.

❖ Implementation

Providing hygiene is a very basic part of a patient's care. The use of caring practices helps to alleviate the patient's anxiety and promote comfort and relaxation while you perform each hygiene measure. For example, while giving a patient a bath and changing a gown, use a gentle approach in turning and repositioning the patient and use a soft, gentle voice while conversing with the patient to help relieve any fears or concerns. For patients with symptoms such as pain or nausea, administering symptom relief therapies before starting hygiene care helps to prepare the patient for the procedure.

Another important part of implementation is assisting patients to administer their own hygiene. This includes educating patients on proper hygiene techniques and connecting patients with the community resources necessary to enable them to perform hygiene care. The same patients at risk for hygiene problems are those in greatest need of understanding their risks, knowing the implications, and having the information they need to make choices about when and how hygiene is performed.

Health Promotion

In primary health care settings, educate and counsel patients and families on appropriate hygiene techniques. A new mother

► BOX 37-7

Educating Patients About Hygiene Care

- Make instructions relevant. After assessing a patient's knowledge, motivation, and health beliefs, provide information that relates to the patient's situation and will be most useful in resolving the patient's problem. For example, when offering foot care instruction to a patient with diabetes mellitus, explain how the circulation to the feet can be impaired and how that poses a risk for poor healing and infection should the skin become cut or broken.
- Adapt teaching of techniques to the patient's personal bathing facilities. Not all patients will have the ideal situation that exists in a health care setting (e.g., easily accessible shower or a bedside table to place over a bed). Use the facilities or equipment that the patient has so that personal care items are easy to reach, the patient's safety is ensured, and the patient feels comfortable when performing hygiene. For example, a young mother may feel more comfortable bathing an infant in a baby bath chair.
- Teach the patient steps to take to avoid injury. Almost any hygiene procedure can pose risks (e.g., cutting a nail too close to the skin, failing to adjust the water temperature of a bath, or using tap water for contact lens care). Any instruction you provide must clearly outline safety risks.
- Reinforce infection control practices. Damage to the skin, mucosa, eyes, or other tissues creates an immediate risk for infection. Be sure the patient understands the relationship between healthy and intact skin and tissues, hand hygiene practices, and the prevention of infection.

needs assistance in learning how to bathe her newborn infant. An older adult needs to become informed about the importance of regular ear care to avoid hearing deficits resulting from accumulated cerumen. When assisting patients, maintain the standards for hygiene illustrated in this chapter and incorporate adaptations as needed to their lifestyle, living arrangements, abilities, and preferences. Guidelines to assist you in providing education to patients about hygiene are presented in Box 37-7.

Acute and Restorative Care

Nursing knowledge and skills needed for performing hygiene care are consistent across all health care settings where acute and restorative care are provided. In addition, some of the skills in this section are applicable in areas of health promotion.

In health care settings where patients receive direct nursing care, a variety of scheduled hygiene measures are provided (Box 37-8). Times may change because of factors affecting your organization or scheduling of care such as planned diagnostic and treatment procedures, the patient's need for more hygiene, or your work assignment. In long-term care facilities, the schedule for hygiene may be less frequent.

Bathing and Skin Care

Bathing and skin care are a part of total hygiene. The extent of patients' bath and the methods used for bathing depend on their physical abilities, health problems, and the degree of hygiene required. If patients are physically dependent or cognitively impaired, increase skin assessment and provide skin care directed toward reducing the risk for skin breakdown. When bathing cognitively impaired patients, consider their

► BOX 37-8

Hygiene Care Schedule in Acute and Long-Term Care Settings**Early Morning Care**

If you work the night shift, you may be required to provide basic hygiene to patients getting ready for breakfast, scheduled tests, or early morning surgery. Early morning care (often referred to as "A.M. care") includes offering a bedpan or urinal if the patient is not ambulatory, washing the patient's hands and face, and assisting with oral care.

Routine Morning Care

Before or after breakfast, assist by offering a bedpan or urinal to patients confined to bed; providing a bath or shower; giving perineal care; giving oral hygiene and foot, nail, and hair care; giving a back rub; changing the patient's gown or pyjamas; changing the bed linens; and straightening the patient's bedside unit and room. This is often referred to as "complete A.M. care."

Afternoon Care

Hospitalized patients often undergo many exhausting diagnostic tests or procedures in the morning. In rehabilitation centres, patients may participate in physiotherapy during the morning. Afternoon hygiene care includes washing the hands and face, assisting with oral care, offering a bedpan or urinal to those patients who are not ambulatory, and straightening bed linen.

Evening, or Hour-Before-Sleep, Care

Before bedtime, offer personal hygiene care that helps a patient relax to promote sleep. Evening care, or P.M. care, may include changing soiled bed linens, gowns, or pyjamas; assisting the patient in washing the face and hands; providing or assisting with oral hygiene; giving a back massage; and offering a bedpan or urinal to nonambulatory patients. Ask patients if they would like a beverage, such as juice, if permitted.

special needs and challenges (Box 37-9). These patients can easily become afraid, may use physical and verbal aggressive behaviours to avoid bathing, and may also display self-injurious behaviours (Miller, 2009).

A **complete bed bath** is used with patients who are totally dependent and require total hygiene care. It is an activity that can be exhausting for patients, even if you provide all the care. You must anticipate and assess whether patients are physically able to tolerate a complete bath. Measuring patients' vital signs before, during, and after the bath provides a measure of their physical tolerance. A **partial bed bath** involves bathing only those body parts that would cause discomfort or odour if not cleansed, and those areas not easily reached by the patient. This includes perineal care. Aging or dependent patients in need of only partial hygiene and self-sufficient bedridden patients unable to reach all body parts receive partial bed baths. Carefully assess patients to determine the amount of assistance required during hygiene care. Skill 37-1 outlines the procedures for bathing a bedridden client.

When administering a complete or partial bath, it is important to assess the condition of the skin to determine which type of cleansing product is necessary or whether the patient requires daily bathing. Patients with excessively dry skin are predisposed to skin impairment. You may decide to skip a bath for a day or bathe only badly soiled areas. The use of a soap that contains emollients is another option. Lubricating the skin with lotion can also help reduce dryness.

* BOX 37-9

EVIDENCE-INFORMED PRACTICE GUIDELINE**Bathing Patients Who Have Dementia or Alzheimer's Disease**

Provide individualized and flexible patient-centred care:

- Obtain bathing history—what works, what doesn't work.
- Identify bathing preferences from the patient, other caregivers, or family.
- Determine the method that is least distressing to the patient (e.g., soaking feet in the bathtub; use of prepackaged commercial bath cleansing products [see Figure 37-8]; no-rinse shampoo cap—if hair washing causes the patient distress).
- If patient fears water, try using coloured water or drawing a bubble bath.
- Prepare the bath environment in advance, adequate lighting, necessary supplies (soap, shampoo, towels, etc).
- Minimize the time the patient is unclothed, and ensure the bathing environment is warm.
- Use distraction and negotiation instead of demands (e.g., give the patient a washcloth to keep hands occupied).
- Minimize noise in the bathing area or play their favorite music softly in the background.
- Set priorities regarding which body parts need bathing and which parts can be "skipped" (e.g., separate hair washing from bathing).
- Assess whether the patient requires glasses or a hearing aid, which can assist with communication (remove aids as required during bathing after communicating your intent to the patient).
- Praise the patient's accomplishments.



Adapted from Alzheimer Society of Canada. (2002). *The Alzheimer journey: Understanding Alzheimer disease: The link between brain and behaviour* [Module 4: Alzheimer Care: Daily Living, in video and workbook series]. Retrieved from <http://www.alzheimer.ca/english/disease/whatisitvideo.htm>; Alzheimer Society of Canada. (2011, November 22). *Living with dementia: Day to day living: Personal care: Bathing*. Retrieved from www.alzheimer.ca/en/Living-with-dementia/Day-day-living/Personalcare/Bathing; and Rader, J., Barrick, A. L., Hoeffer, B., Sloane, P. D., McKenzie, D., Talerico, K., & Glover, J. (2006). The bathing of older adults with dementia: Easing the unnecessarily unpleasant aspects of assisted bathing. *AJN*, 106(4), 40–48.

The tub bath or shower can be used to give a more thorough bath than a bed bath. Safety is of primary concern because the surface of a tub or shower stall is slippery. In some settings, it is necessary to obtain a physician's or nurse practitioner's order for a shower or tub bath. In some agencies, showers are equipped with a chair for patients with weakness or poor balance. Both tubs and showers should be equipped with grab bars for patients to hold on to during their entry and exit and when manoeuvring. Patients vary in how much assistance they need. Regardless of the type of bath the patient receives, the following guidelines should be used:

- **Provide privacy.** Close the door or pull the room curtains around the bathing area. While bathing the patient, expose only the areas being bathed.
- **Maintain safety.** Keep the side rails up while away from the patient's bedside. This is critical for dependent, debilitated, and unconscious patients. (Note: When side rails are used as a restraint, a physician's order may be needed. Check your agency's policy.) Place the call light within the patient's reach if you are leaving the room temporarily.

Text continued on p. 850

► SKILL 37-1 Bathing a Patient



Delegation Considerations

Skills of bathing may be delegated to an unregulated care provider. Instructions about the following should be provided:

- The importance of not massaging reddened skin areas
- The clarification of early signs of impaired skin integrity
- The importance of reporting changes in the patient's skin
- Proper positioning of an in-dwelling catheter during perineal care
- The importance of reporting any perineal drainage, excoriation, or rash observed

Equipment

- Washcloths and bath towels
- Wash basin
- Bath blanket (warm, if possible)
- Cleansing solution (agency or patient specific)
- Personal hygiene items (unscented deodorant, powder, lotion,)
- Clean hospital gown or patient's own pyjamas or gown
- Bed linen
- Linen bag
- Disposable gloves
- Disposable wipes
- Bedpan or urinal

Procedure

STEPS

General Instructions

1. Review orders for specific safety measures concerning the patient's movement, positioning, or isolation precautions.
2. Explain procedure, and ask patient for suggestions on how to prepare supplies. Encourage and promote independence by asking the patient how much of the bath he or she wishes to complete.
3. Assess patient's ability to perform self-care and allow patient to perform as much of the bath as possible.
4. Assess patient's tolerance for activity, comfort level, cognitive ability, and musculoskeletal function.

RATIONALE

- Prevents accidental injury to the patient during bathing activities.
- Determines level of assistance required by the patient.
- Promotes patient's cooperation and participation.
- Promotes patient's comfort and provides an opportunity to include cultural or personal hygiene preferences in hygiene care.
- Patient participates in plan of care.
- Determines the amount of assistance required, the need for specialized equipment or additional personnel.
- Encourages and promotes independence.
- Determines patient's ability to perform self-care and level of assistance required. Also determines type of bath to administer (e.g., tub bath or partial bed bath).

Critical Decision Point: Patients whose level of independence and mobility change frequently may require more or less assistance during bathing.

5. Assess patient's bathing preferences: frequency, type of hygiene products, and other factors related to patient preferences.
6. Ask whether patient has noticed any problems or unusual marks on skin. Observe the skin throughout the procedure, paying particular attention to areas that were previously soiled or reddened or showed early signs of breakdown.
7. Begin complete or partial bed bath, or tub/whirlpool bath or shower.
 - A. Complete or partial bed bath
 - (1) Close room doors and draw the room divider curtain.
 - (2) Prepare equipment and supplies.
 - (3) For nonambulatory patients, offer a bedpan or urinal. Provide a towel and washcloth for perineal care afterward.
 - (4) Perform hand hygiene. If patient's skin is soiled with drainage or body secretions, put on disposable gloves. Ensure the patient is not allergic to latex.
 - (5) Place hospital bed at appropriate level, lower side rail closest to you. Assist patient in assuming a comfortable position, preferably supine. Bring or have the patient move toward side closest to you.
 - (6) Loosen the top covers. Place bath blanket over the top sheet. Remove top sheet from under the blanket. If possible, have patient hold bath blanket while you withdraw sheet. Optional: Use the top sheet when a bath blanket is not available.

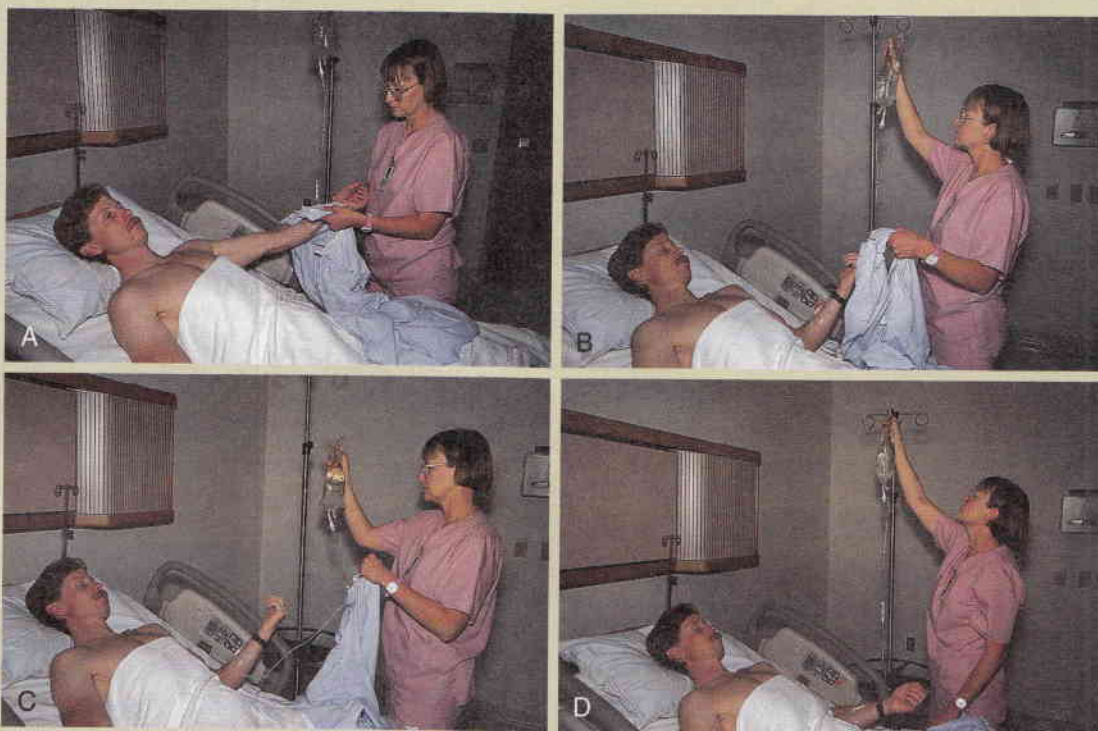
- Encourages and promotes patient participation.
- Provides information to direct physical assessment of skin during bathing.
- Privacy ensures patient's mental and physical comfort.
- Reduces transmission of microorganisms and avoids interrupting the procedure or leaving the patient unattended to retrieve missing equipment.
- Patient will feel more comfortable after voiding. Prevents the interruption of bath.
- Reduces transmission of microorganisms.
- Raising the height of the bed to the appropriate position facilitates proper body mechanics. Maintains patient's comfort throughout procedure. Minimizes strain on back muscles because you do not have to reach across bed.
- Removal of top linens prevents them from becoming soiled or moist during the bath. Blanket provides warmth and privacy. The patient is not exposed unnecessarily.

Continued

► SKILL 37-1 Bathing a Patient—cont'd

video

- (7) If top sheet is to be reused, fold it for replacement later. If not, dispose in linen bag, taking care not to allow linen to contact uniform.
 - (8) Assist patient with oral hygiene. See Skill 37-3.
 - (9) Remove patient's gown or pyjamas. If the patient has an IV infusing and the gown has snaps, simply unsnap and remove the gown without disconnecting the IV tubing. If the gown does not have snaps, remove gown from the arm without IV first; then lower the IV container or remove from the pump and slide the gown covering the affected arm over the tubing and container. Rehang IV container and check flow rate (see Step 7A(9) illustrations) or reset pump rate. Do not disconnect the tubing. If an extremity is injured or has reduced mobility, begin removal from the unaffected side.
- Proper disposal prevents transmission of microorganisms.
 - Provides full exposure of body parts during bathing. Undressing unaffected side first allows easier manipulation of gown over body part with reduced range of motion (ROM).
 - Manipulation of IV tubing and container will possibly disrupt flow rate.



Step 7A(9) A, Remove patient's gown. B, Remove IV from pole. C, Slide IV tubing through arm of patient's gown. D, Rehang IV bag and check flow rate.

Critical Decision Point: If available, be sure that patients with an IV or upper extremity injury have a gown with snap or tie sleeves; this ensures easy access to the upper extremities during hygiene.

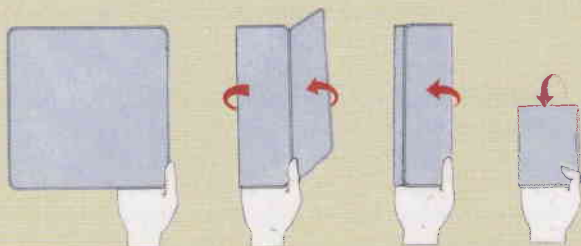
Critical Decision Point: When an IV pump is used, it may be appropriate to manually adjust the IV flow rate to keep-vein-open (KVO) and remove the IV tubing from the pump (check agency policy). Once the gown has been removed, reset the pump to the prescribed IV flow rate (see Chapter 39).

- (10) Raise the side rail. Fill a wash basin two-thirds full with warm water. Have patient place fingers in water to test temperature tolerance. Change the water as necessary throughout the bath.
 - (11) Remove pillow, if allowed, and raise head of the bed 30–45 degrees. Place bath towel under the patient's head. Place a second bath towel over patient's chest.
 - (12) Immerse washcloth in water and wring thoroughly. If desired, fold the washcloth around the fingers of your hand to form a mitt (see Step 7A(12) illustration).
- Raising side rail maintains the patient's safety as you leave the bedside. Warm water promotes comfort, relaxes muscles, and prevents unnecessary chilling. Testing the temperature prevents accidental burns.
 - Removal of the pillow makes it easier to wash the patient's ears and neck. The placement of towels prevents soiling of the bed linen and bath blanket.
 - A mitt retains water and heat better than a loosely held washcloth and prevents splashing and cold edges from brushing against the patient.

► SKILL 37-1 Bathing a Patient—cont'd

video

- (13) Inquire whether the patient is wearing contact lenses. Wash patient's eyes with plain warm water. Use a different section of mitt for each eye. Move mitt from inner to outer canthus (see Step 7A(13) illustration). Soak any crusts on eyelid for 2–3 minutes with damp cloth before attempting removal. Dry eyes thoroughly but gently.



Step 7A(12) Steps for folding washcloth to form a mitt.

- (14) Ask whether patient prefers to use soap on his or her face. Wash, rinse, and thoroughly dry all areas of the face, neck, and ears. (Men may wish to shave at this point or after the bath.)
- (15) Expose patient's arm that is farthest from you and place bath towel lengthwise under the arm.
- (16) Bathe arm using long, firm strokes from distal to proximal areas (fingers to axilla). Raise and support arm as needed while thoroughly washing the axilla (see Step 7A(16) illustration).



Step 7A(16) Washing from fingers to axilla.

- (17) Rinse and dry arm and axilla thoroughly. If patient uses deodorant or talcum powder, apply it.
- (18) Fold bath towel in half and lay it on the bed beside the patient. Place a basin on the towel. Immerse patient's hand in water. Allow hand to soak for 3–5 minutes before washing hand and fingernails (see Skill 37-2). Remove basin and dry hand well.
- (19) Cover the arm with bath blanket or towel. Repeat steps 15–18 for the other arm.

- Soap irritates eyes. The use of separate sections of mitt reduces infection transmission. Bathing the eye from inner to outer canthus prevents secretions from entering nasolacrimal duct. Pressure can cause internal injury.



Step 7A(13) Wash eye from inner to outer canthus.

- Soap tends to dry the face, which is exposed to air more than other body parts.
- Prevents soiling of bed. Washing far side first eliminates contaminating clean areas once they are washed.
- Soap lowers the surface tension of the skin and facilitates the removal of debris and bacteria when friction is applied during washing. Long, firm strokes stimulate circulation. Movement of the arm exposes the axilla and exercises the joint's normal ROM.

- Excess moisture causes skin maceration or softening. Deodorant controls body odour.
 - Soaking softens cuticles and calluses of the hand, loosens debris beneath nails, and enhances the feeling of cleanliness. Thorough drying removes moisture from between fingers.
- Note:* Do not soak if the patient is diabetic or is cognitively impaired and unable to understand the procedure.

Critical Decision Point: If a patient is at risk for falls, be sure the two side rails are up before obtaining fresh water or other supplies. Remember, side rails cannot be used as a restraint unless ordered.

Continued

► SKILL 37-1 Bathing a Patient—cont'd

video

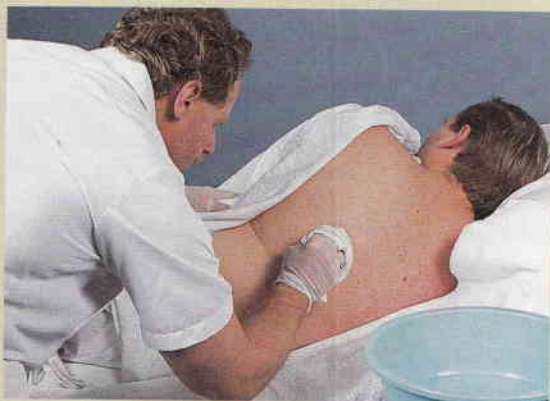
- (20) Cover patient's chest with a bath towel, and fold bath blanket down to the umbilicus. With one hand, lift edge of towel away from patient's chest. With washcloth or mittened hand, bathe chest using long, firm strokes. Take special care to wash skinfolds under the patient's breasts. Keep patient's chest covered between wash and rinse periods. Dry well.
 - (21) Place bath towel lengthwise over patient's chest and abdomen. (Two towels may be needed.) Fold blanket down to just above the pubic region.
 - (22) With one hand, lift the bath towel. With mittened hand, bathe the abdomen, giving special attention to bathing the umbilicus and abdominal folds. Keep the abdomen covered between washing and rinsing. Dry well.
 - (23) Cover patient's chest and abdomen with top of the bath blanket or bath towels. Expose far leg by folding blanket toward midline. Be sure other leg and perineum are covered.
 - (24) Place bath towel lengthwise under the far leg and, using firm strokes (unless contraindicated), wash, rinse, and dry thoroughly. Support the leg with one hand if patient is unable to support it.
- Draping prevents unnecessary exposure of body parts. The towel maintains warmth and privacy. Secretions and dirt collect easily in areas of tight skinfolds. Skinfolds are susceptible to excoriation if not cleaned and dried properly.
 - Prevents chilling and unnecessary exposure of body parts.
 - Moisture and sediment that collect in skinfolds predispose skin to maceration and irritation.
 - Maintains patient's warmth and comfort. Prevents chilling and unnecessary exposure.
 - Promotes venous return.

Critical Decision Point: Patients with a history of deep vein thrombosis (DVT) or hypercoagulation disorders should not have their lower extremities washed with long firm strokes.

- (25) Cleanse the foot, making sure to bathe between toes. Clean and clip nails as per physician or nurse practitioner orders (see Skill 37-2). Dry well. If skin is dry, apply lotion.
- Secretions and moisture can accumulate between the toes. Lotion helps retain moisture and soften the skin.
 - Patient's own nail clippers should be used to avoid the transmission of microorganisms.

Critical Decision Point: Do not massage any reddened area on the patient's skin as it can increase the risk of skin breakdown (Youell & Wright, 2010).

- (26) Repeat Steps 23–25 for the other leg and foot.
 - (27) Assist patient in assuming a prone or side-lying position (as applicable). Place the towel lengthwise along the patient's side. Put on disposable gloves if not done so already.
 - (28) Wash, rinse, and dry patient's back from neck to buttocks using long, firm strokes (see Step 7A(28) illustration). Pay special attention to folds of the buttocks and the anus for redness or skin breakdown. Give a back massage (see Chapter 41). Change bath water if necessary and put on disposable gloves.
- Exposes back and buttocks for bathing. Prevents contact with microorganisms in body secretions.
 - Maintains warmth and prevents unnecessary exposure. Skinfolds near buttocks and anus may contain fecal secretions that harbour microorganisms.
 - Prolonged pressure on the sacral area or other bony prominences may lead to the development of pressure ulcers.
 - Changing the water prevents the transfer of microorganisms from the anal area to genitalia.



Step 7A(28) Washing patient's back.

► SKILL 37-1 Bathing a Patient—cont'd

video

(a) Female perineal care

- (a1) Assist patient in assuming a dorsal recumbent position, if not contraindicated. Cover chest and upper extremities with a towel and lower extremities with a bath blanket. Expose only the genitalia. (If patient can wash, covering entire body with a bath blanket may be preferable.) Clean the perineal area. Pay special attention to skinfolds. Patients at risk for infection of the genitalia, urinary tract, or reproductive tract include those with in-dwelling catheters or fecal or urinary incontinence. If fecal material is present, enclose in a fold of underpad and remove with disposable wipes.
- (a2) Wash labia majora. Wipe from the perineum to the rectum. Repeat on the opposite side using a different section of the washcloth.
- (a3) Separate the labia with your nondominant hand, exposing the urethral meatus and vaginal orifice. Wash downward from the pubic area toward the rectum in one smooth stroke (see Step 7A(28)(a3) illustration). Use a separate section of cloth for each stroke. Cleanse thoroughly around the labia minora, clitoris, and vaginal orifice.
- (a4) Assist patient to a comfortable position.
- (a5) Remove disposable gloves and perform hand hygiene.

(b) Male perineal care

- (b1) Lower the side rails, and assist patient to a supine position. Note restriction in mobility. Patients at risk for infection of the genitalia, urinary tract, or reproductive tract include uncircumcised males and patients with in-dwelling catheters or fecal or urinary incontinence.
- (b2) Gently raise the penis, and place a bath towel underneath. Gently grasp the shaft of penis. If the patient is uncircumcised, retract the foreskin (see Step 7A(28)(b2) illustration). If the patient has an erection, perineal care can be deferred until later.

- Provides easy access to genitalia.
- Patients capable of performing partial bath usually prefer to wash their own genitalia.
- Secretions that accumulate on surface of skin surrounding genitalia act as reservoir for infection.
- Cleansing reduces transmission of microorganisms from the anus to the urethra or genitalia.
- Wiping from the perineum to the rectum reduces the chance of transmitting fecal organisms to the urinary meatus.
- Cleansing method reduces the risk of transferring of microorganisms to the urinary meatus (cleansing from area of least contamination to most contamination as secretions that collect around the labia minora facilitate bacterial growth). (For menstruating women or patients with in-dwelling urinary catheters, cleanse with disposable wipes.)
- Prevents the transmission of infection.

- Provides full exposure of male genitalia.
- Patients capable of performing partial bath usually prefer to wash their own genitalia.
- Gentle but firm handling reduces the chance of the patient having erection. Secretions capable of harbouring microorganisms collect underneath foreskin. Cleansing the penis can lead to an erection, which can embarrass both the patient and you.



Step 7A(28)(a3) Cleanse from perineum to rectum (front to back).

- (b3) Wash tip of the penis at the urethral meatus first using a circular motion. Cleanse from the meatus outward. Rinse and dry gently.
- (b4) Return foreskin to its natural position.



Step 7A(28)(b2) Retract foreskin.

- The direction of the cleansing moves from areas of least contamination to most contamination, preventing microorganisms from entering urethra.
- Tightening of the foreskin around the shaft of the penis can cause local edema and discomfort.

Continued

SKILL 37-1 Bathing a Patient—cont'd



- (b5) Wash the shaft of the penis with gentle but firm downward strokes. Pay special attention to the underlying surface of the penis. Rinse and dry thoroughly.
- (b6) Gently cleanse scrotum, making sure to wash underlying skinfolds. Rinse and dry thoroughly.
- (b7) Inspect the surface of external genitalia after cleansing.
- (b8) If the patient has bowel or urinary incontinence, apply a thin layer of skin barrier cream to the buttock, anus, and perineal area.
- (b9) Assist patient to a comfortable position and cover with bath blanket.
- (29) Assist patient in dressing. Comb patient's hair. Women may want to apply makeup, and men may wish to shave at this point. Assist patient to a chair or wheelchair.
- (30) Make the patient's bed (see Skill 37-5).
- (31) Remove soiled linen and place it in linen bag. Clean and replace the bathing equipment. Replace the call light and personal possessions. Leave the room as clean and comfortable as possible.
- (32) Remove disposable gloves (if applied) and perform hand hygiene.

B. Tub or whirlpool bath or shower (verify with agency policy whether a physician's or nurse practitioner's order is needed and whether you need to remain in the room during the patient's bath)

- (1) Check tub or shower for cleanliness. Use cleaning techniques outlined in agency policy. Place rubber mat on tub or shower bottom. Place disposable bath mat or towel on the floor in front of the tub or shower.
- (2) Collect all hygienic aids, toiletry items, and linens requested by the patient. Place within easy reach of the tub or shower.
- (3) Assist patient to the bathroom if necessary. Have patient wear a robe and slippers to bathroom.
- (4) Demonstrate how to use the call signal for assistance.
- (5) Place an "occupied" sign on bathroom door.
- (6) Provide a shower seat or tub chair if needed (see Step 7B(6) illustration). Fill the bathtub halfway with warm water. If patient's sensation is normal, ask patient to test the water, and adjust the temperature if the water is too warm. Explain which faucet controls hot water. If patient is taking shower, turn it on and adjust the water temperature before patient enters the shower stall.

- The underlying surface of penis may have a greater accumulation of secretions.
- Pressure on scrotal tissue can be painful to the patient. Secretions collect between skinfolds.
- Thick secretions may cover underlying skin lesions or areas of breakdown. Evaluation determines the need for additional hygiene.
- Protects skin from excess moisture and toxins from urine and stool.
- Promotes patient's body image.
- Provides a clean environment.
- Prevents the transmission of microorganisms. A clean environment promotes the patient's comfort. Keeping the call light and articles of care within reach promotes the patient's safety.
- Reduces the transmission of microorganisms.
- Cleaning prevents the transmission of microorganisms. Mats prevent slipping and falling.
- Placing items close at hand prevents possible falls when patient reaches for equipment.
- Assistance prevents accidental falls. Wearing a robe and slippers prevents chilling and provides for privacy and comfort.
- Bathrooms are equipped with signalling devices in case a patient feels faint or weak or needs immediate assistance. Patients prefer privacy during bathing if safety is not jeopardized.
- Maintains the patient's privacy.
- The use of assistive devices facilitates bathing and minimizes physical exertion. Adjusting water temperature prevents accidental burns. Older adults and patients with neurological alterations (e.g., spinal cord injury) are at high risk for burns as a result of reduced sensation.



Step 7B(6) Shower seat for patient safety.

► SKILL 37-1 Bathing a Patient—cont'd



- (7) Instruct the patient to use safety bars when getting in and out of the tub or shower. Caution the patient against use of bath oil in tub water.
- (8) Instruct the patient not to remain in tub >20 minutes. Debilitated patients should not be left alone while in the tub. Observe ROM during bath.
- (9) Return to the bathroom when the patient signals, and knock before entering.
- (10) For the patient who is unsteady, drain the tub of water before patient attempts to get out of it. Place a bath towel over patient's shoulders. Assist patient in getting out of tub as needed, and assist with drying. If the patient is weak or unstable, have another person assist.
- Prevents slipping and falling. Oil causes tub surfaces to become slippery.
- Prolonged exposure to warm water may cause vasodilation and pooling of blood, leading to lightheadedness or dizziness. Measures joint mobility.
- Provides privacy.
- Prevents accidental falls. Patient may become chilled as water drains.

Critical Decision Point: Weak or unstable patients need extra assistance in getting out of a tub. Planning for additional personnel is essential before attempting to assist a patient from tub.

- (11) Observe patient's skin, paying particular attention to areas that were previously soiled, reddened, or showed early signs of breakdown.
- (12) Assist patient as needed in donning a clean gown or pyjamas, slippers, and robe. (In a home setting, the patient may don regular clothing.)
- (13) Assist patient to his or her room and a comfortable position in a bed or chair.
- (14) Clean the tub or shower according to agency policy. Whirlpool baths may require special cleaning. Remove soiled linen and place it in a linen bag. Discard disposable equipment in the proper receptacle. Place an "unoccupied" sign on the bathroom door. Return supplies to the storage area.
- (15) Perform hand hygiene.
- Techniques used during bathing should leave skin clean and clear.
- Maintains warmth to prevent chilling.
- Maintains relaxation gained from bathing.
- Prevents the transmission of infection through soiled linen and moisture.
- Reduces the transfer of microorganisms.

Unexpected Outcomes

Areas of excessive dryness, rashes, or irritation, or signs of pressure ulcer on patient's skin

Inflammation of skin and genitalia, with localized tenderness, swelling, and presence of foul-smelling discharge

Patient expresses perineal discomfort

Patient unable to perform perineal care correctly

Patient becomes excessively fatigued and unable to cooperate or participate in bathing

Patient seems unusually restless or complains of discomfort

Related Interventions

- Review your agency's skin care policy regarding special cleansing and moisturizing products.
- Limit the frequency of complete baths.
- Complete a pressure ulcer assessment (see Chapter 46).
- Obtain a special bed surface if patient is at risk for or has skin breakdown.
- Bathe the area frequently to keep it clean and dry.
- Obtain an order for a sitz bath.
- Apply a protective barrier.
- Notify the physician or nurse practitioner and apply prescribed antibacterial or antifungal ointment or cream.
- Increase the frequency of perineal care.
- Assess the perineum for signs of excoriation, swelling, irritation or discharge.
- Review perineal care with the patient.
- Position the patient and have patient observe the cleansing procedure.
- Reschedule bathing to a time when the patient is more rested.
- Patients with cardiopulmonary conditions and breathing difficulties may require a pillow or elevated head of the bed during bathing.
- Notify the physician about changes in the patient's fatigue level.
- Schedule rest periods.
- Consider analgesia before bathing.
- Schedule rest periods before bathing.

Continued

► SKILL 37-1 Bathing a Patient—cont'd

video

Recording and Reporting

- Record the condition of skin and any significant findings (e.g., reddened areas, bruises, nevi, or joint or muscle pain).
- Report any evidence of alterations in skin integrity or increased wound secretions to the person in charge or the physician.
- Record the presence of any abnormal findings (e.g., the character and amount of discharge or condition of the genitalia), and record any related procedure you perform.
- Record the appearance of a suture line, if present.
- Report any break in a suture line or the presence of abnormalities to the person in charge or the physician.
- Record all procedures performed, the amount of assistance provided, and the extent of the patient's participation.

Home Care Considerations

- Assess the patient's tub and shower area for the need for safety devices (e.g., grab bars, bath mats).
- Assess the patient for the need for assistive bathing devices (e.g., shower chair, hand-held shower).
- Instruct caregivers to assess the patient's perineal area daily for signs of infection and skin breakdown.

Older Adult Considerations

- Check the temperature of water carefully as the patient's sensitivity to temperature may be impaired.
- Continent patients may not require bathing every day, especially if dry skin is a problem.

- *Maintain warmth.* The room should be kept warm because the patient is partially uncovered and may easily be chilled. Wet skin causes an excess loss of heat through convection. Control drafts. Keep the patient covered, exposing only the body part being washed during the bath.
- *Promote independence.* Encourage the patient to participate in as much of the bathing activities as possible. Offer assistance when needed.
- *Anticipate needs.* Bring a new set of clothing and hygiene products to the bedside or bathroom.

Bag Baths. An innovative approach to the traditional bed bath was developed because of concern for patients who are predisposed to dry skin and the risk for infection. When wash basins are not cleaned and dried completely after use, contamination with Gram-negative organisms may occur. Successive uses of the basin may cause a patient's skin to harbour more Gram-negative organisms. The "bag bath" (Figure 37-8) is a specially prepared package containing 10 washcloths that are premoistened with a mixture of water and a nonrinsable cleanser. The bag bath package is warmed in a microwave before use, and a different cloth is used for each part of the patient's body. With this technique, the skin air-dries because towel drying removes the emollient that is left behind after the water-cleanser solution evaporates. Health care personnel who have used the bag bath products report shorter bathing times and increased patient satisfaction and staff productivity (Howe, 2008).

Perineal Care. Perineal care is usually part of a complete bed bath (see Skill 37-1). Patients most in need of perineal care are those at greatest risk for acquiring an infection (e.g., patients who have in-dwelling urinary catheters, patients who are recovering from rectal or genital surgery or childbirth, uncircumcised males, patients who are incontinent, or patients who are morbidly obese). In addition, women who are having a menstrual period require good perineal care. Patients who are able to perform self-care should be encouraged to do so. Sometimes you can feel embarrassed when providing perineal care, particularly for patients of the opposite sex. Similarly, patients may feel embarrassed, but this should not cause you to overlook patients' hygiene needs. A professional, dignified, and sensitive approach can reduce embarrassment and put the patients at ease.



Figure 37-8 Commercial bath cleansing pack. **Source:** From Sage Products, Cary, IL. (2009). Retrieved from <http://www.comfortbath.com>.

If patients perform self-care, various problems such as vaginal and urethral discharge, skin irritation, and unpleasant odours may go unnoticed. You must be alert for complaints of burning during urination or localized tenderness, excoriation, or pain in the perineum. You should also inspect your patients' bed linen for signs of discharge.

Back Rub. A back rub or massage is usually performed after a patient's bath. It promotes relaxation, relieves muscular tension, stimulates circulation, and improves sleep (Ebersole et al., 2008). Zullino et al. (2005) posit that massage is associated with a reduction in blood pressure, a reduction in pain, and decreases anxiety and depression. Patients generally report that they are more comfortable after a back rub or massage and find the experience pleasant, regardless of the length of the massage.

When providing a back rub, relaxation can be enhanced by reducing any noise and ensuring that the patient is comfortable. Because some individuals may dislike physical contact, it is important to ask the patient whether he or she would like

* BOX 37-10

EVIDENCE-INFORMED
PRACTICE GUIDELINE**Reducing the Incidence and Prevalence of Pressure Ulcers**

According to a study funded by the Canadian Association of Wound Care (CAWC) in 2003, the mean prevalence rate of pressure ulcers in Canadian health care settings is 26%. Pressure ulcers cause patients stress, pain and suffering, increased length of hospital stay, and increased workload for health care staff. The CAWC estimates that the cost of treating a patient with an uncomplicated pressure ulcer to be \$2400 to \$3200 per month and treatment for a complicated ulcer is estimated to be \$12,000, which includes supplies and nursing care (Orsted et al., 2009). The goal of the Pressure Ulcer Awareness and Prevention (PUAP) program created by the CAWC is to increase awareness of the high cost of pressure ulcers, through education and support, to improve clinical practice, and to create and improve current policies in health care facilities to shift from treatment to prevention of pressure ulcers.

**Nursing Implications**

One of the key components of the nursing history and physical examination is the assessment of the integument for pre-existing conditions or risk assessment for potential breakdown in skin integrity. Risk assessment can be accomplished utilizing the Braden Scale for Assessment of Pressure Ulcer Risk (see Table 46-2, p. 1260) to identify those patients at risk so that strategies can be implemented to reduce the risk. Nurses are in position to have an impact on the financial costs of pressure ulcers to both the health care system and the patients by completing thorough, daily skin assessment during hygiene care or independently for early recognition and early intervention.

References: Orsted, H. L., Rosenthal, S., & Woodbury, M. G. (2009). Pressure ulcer awareness and prevention program: A quality improvement program through the Canadian Association of Wound Care. *Journal of Wound, Ostomy and Continence Nurses*, 36(2), 178–183; Dibsie, L. G. (2008). Implementing evidence-based practice to prevent skin breakdown. *Critical Care Nursing Quarterly*, 31(2), 140–149.

a back rub and whether gentle or deep massage is preferred. The patient's medical record should be reviewed for any contraindications to massage (e.g., fractured ribs, burns of the skin, or heart surgery). Box 37-10 examines the incidence and prevalence of pressure ulcers along with the associated costs and nursing implications.

Foot and Nail Care. Foot and nail care should be incorporated into a person's regular hygiene routine. Routine care involves soaking to soften the cuticles, thorough cleansing, drying, and proper nail trimming. The exception involves patients with diabetes mellitus, who do not soak their feet because of the risk of infection. When providing foot and nail care, patients may remain in bed or sit in a chair (Skill 37-2). In some settings or with specific patients, such as a person with diabetes mellitus, a physician's or nurse practitioner's order is needed to trim the toenails. Before implementing this procedure, check your agency's policy.

During the procedure, time is taken to teach the patients and family members the proper techniques for cleaning and nail trimming. Measures to prevent infection and promote good circulation should be stressed. Patients learn to protect

their feet from injury, keep their feet clean and dry, and wear footwear that fits properly. Patients are instructed on the proper way to inspect all surfaces of the feet and hands for lesions, dryness, and signs of infection. It is important for patients to recognize any abnormalities and the importance of reporting these conditions to their caregiver.

Patients with diabetes mellitus and/or peripheral vascular disease are at risk for the development of foot ulcers as a result of poor peripheral blood supply to the feet and decreased sensation in the feet. These lesions are slow to heal due to compromised circulation over time and can result in amputation (Senthuran, 2010). Appropriate patient teaching and daily foot care practices, along with early detection of diabetic foot ulcers, can decrease the risk of amputation (Canadian Diabetes Association, 2008).

Patients with diabetes mellitus or peripheral vascular disease should be provided information regarding how circulation directly affects the health and integrity of tissues of the feet and should be advised to use the following guidelines in a routine foot and nail care program:

- Inspect the feet daily, including the tops and soles of the feet, the heels, and the areas between the toes. Use a mirror to help inspect the feet thoroughly or ask a family member to check daily.
- If you have diabetes mellitus, you should receive a thorough foot examination at least once a year. If you have one or more high-risk foot conditions, you should be evaluated more frequently and referred to a specialist as necessary.
- Wash the feet daily using lukewarm water; *do not soak*. If you have reduced sensation, you may want to use a bath thermometer at home to test the water temperature. Thoroughly dry the feet and in between toes.
- Do not cut corns or calluses or use commercial removers. Consult a physician or podiatrist.
- If your feet perspire excessively, apply a nonallergenic foot powder.
- If dryness is noted along the sides of the feet, rub a nonallergenic lotion gently into the skin, wiping off any excess. *Do not apply lotion between the toes, as excessive moisture can result in infection.*
- Trim the toenails straight across and square; do not use scissors. Consult a podiatrist as needed.
- Do not use over-the-counter preparations or home remedies. Consult a physician or podiatrist.
- Constricting garments such as elastic stockings, knee-high hose, and garters and crossing the legs while sitting should be avoided as these can cause impaired circulation to the lower extremities.
- Wear clean, dry socks or stockings daily. Change socks twice a day if feet perspire heavily. Socks should be free of holes or repairs that might cause pressure on the tissue.
- Do not walk barefoot.
- Wear properly fitted shoes with porous uppers if possible. The soles of shoes should be flexible and nonslipping. Shoes should be sturdy, closed in, and not restrictive to the feet. New shoes should be worn for short periods of time over several days to break them in to avoid the formation of blisters. Patients with increased plantar pressure (e.g., due to erythema or callus) should use footwear that cushions and redistributes pressure. Patients with bony deformity (e.g., a bunion or Charcot's joint) may need extra-wide or extra-deep shoes with cushioned insoles.

► SKILL 37-2 Performing Nail and Foot Care

Delegation Considerations

The skill of nail and foot care for the nondiabetic patient can be delegated to a regulated or an unregulated care provider; however, this skill should not be delegated if the patient is diabetic. It is important to discuss the following:

- That nail clipping must be performed by you
- Any special considerations for patient positioning

Equipment

- Wash basin
- Emesis basin
- Washcloth and bath towel
- Nail clippers (the patient's)
- Emery board or nail file
- Unscented lotion
- Disposable bath mat
- Paper towels
- Disposable gloves

Procedure

STEPS

1. Identify patients at risk for foot or nail problems:
 - A. Older adult
 - B. Diabetes mellitus
 - C. Heart failure or renal disease
 - D. Cerebrovascular accident (stroke)
2. Assess patient's knowledge of foot and nail care practices.
3. Ask female patients about whether they use nail polish and polish remover frequently.
4. Assess patient's ability to care for nails or feet: consider visual alterations, fatigue, and musculoskeletal weakness.
5. Assess the types of home remedies (e.g., aloe vera, herbal preparations that the patient uses (Miller, 2009).
 - A. Over-the-counter chemical preparations to remove corns or calluses
 - B. Cutting or shaving of corns or calluses with razor blade or scissors
 - C. Use of oval corn pads
 - D. Application of adhesive tape
6. Assess the type of footwear worn by patients: Are socks worn? Are shoes tight or ill fitting? Are garters or knee-high nylons worn? Is footwear clean?
7. Observe patient's walking gait. Have the patient walk down a hall or in a straight line (if able).
8. Assist an ambulatory patient to sit in a bedside chair. Help a bed-bound patient to a supine position with head of the bed elevated. Place disposable bath mat on the floor under patient's feet or place a towel on the mattress.
9. Obtain a physician's or nurse practitioner's order for cutting nails if agency policy requires it.
10. Explain the procedure to the patient, including the fact that proper soaking requires several minutes.

RATIONALE

- Certain conditions increase the likelihood of foot or nail problems.
- Poor vision, lack of coordination, or inability to bend over contributes to difficulty in performing foot and nail care. Normal physiological changes of aging also result in nail and foot problems (MacDonald-Jenkins, 2009b).
- Vascular changes associated with diabetes mellitus reduce blood flow to peripheral tissues. Breaks in the skin integrity place a diabetic patient at high risk for a skin infection. Meticulous foot assessment and care reduce the diabetic patient's risk of debilitating foot problems (Senthuran, 2010).
- Both conditions can increase tissue edema, particularly in dependent areas (e.g., feet). Edema reduces blood flow to neighbouring tissues.
- The presence of residual foot or leg weakness or paralysis results in altered walking patterns. An altered gait pattern increases friction and pressure on feet.
- Determines patient's need for health teaching.
- Chemicals in these products can cause excessive dryness.
- Demonstrates patient's knowledge of proper foot care. Determines the amount of assistance and teaching required.
- Some preparations can cause injury to soft tissue (e.g., chemicals used to treat calluses) (Senthuran, 2010).
- Chemical preparations can cause burns and ulcerations.
- Cutting of corns or shaving calluses may result in a break in skin integrity and increases the risk for infection.
- Oval pads may exert pressure on the toes, thereby decreasing circulation to surrounding tissues.
- The skin of older adults is thin and delicate and prone to tearing when adhesive tape is removed.
- Types of shoes and footwear may predispose patient to foot and nail problems (e.g., infection, areas of friction, ulcerations). In patients with diabetes mellitus, nonhealing plantar ulcerations have been identified as one of the primary causes of lower limb amputation (Capes, 2007).
- Structural as well as painful disorders of the feet can cause limping or an unnatural gait.
- Sitting in a chair facilitates immersing feet in basin. The bath mat protects feet from exposure to soil or debris.
- The patient's skin may be accidentally cut. Certain patients are more at risk for infection, depending on their medical condition.
- Patient must be willing to place fingers and feet in basins for 10–20 minutes. Patient may become anxious or fatigued.

Critical Decision Point: Patients with diabetes do not soak hands and feet. Soaking increases their risk of infection due to maceration of the skin.

► SKILL 37-2 Performing Nail and Foot Care—cont'd

11. Perform hand hygiene. Arrange equipment on an overbed table.
 12. Fill wash basin with warm water. Test water temperature.
 13. Place basin on bath mat or towel.
 14. Fill emesis basin with warm water, and place basin on paper towels on overbed table.
 15. Pull curtain around the bed or close the room door (if desired).
 16. Inspect all surfaces of the fingers, toes, feet, and nails. Pay particular attention to areas of dryness, inflammation, or cracking. Also inspect the areas between toes, heels, and soles of feet.
- Reduces transmission of microorganisms. Easy access to equipment prevents delays.
 - Warm water softens nails and thickened epidermal cells, reduces inflammation of the skin, and promotes local circulation. Proper water temperature prevents burns.
 - Avoids spills; this maintains the safety of the care provider and the patient.
 - Warm water softens nails and thickened epidermal cells.
 - Maintaining the patient's privacy reduces anxiety.
 - The integrity of feet and nails determines the frequency and level of hygiene required. Heels, soles, and sides of the feet are prone to irritation from ill-fitting shoes.

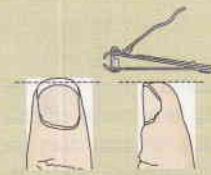
Critical Decision Point: Patients with peripheral vascular diseases or diabetes mellitus, older adults, and patients whose immune system is suppressed may require nail care from a specialist to reduce the risk of infection.

17. Assess the colour and temperature of toes, feet, and fingers. Assess capillary refill. Palpate radial and ulnar pulses of each hand and dorsalis pedis pulses of feet (see Chapter 31).
 18. Instruct patient to place his or her fingers in the emesis basin and place arms in a comfortable position. Assist the patient to place feet in the basin.
 19. Allow patient's feet and fingernails to soak for 10–20 minutes (unless the patient has diabetes). Rewarm the water after 10 minutes.
 20. Clean gently under the fingernails with an orange stick or the wooden end of a cotton-tipped swab while fingers are immersed (see Step 20 illustration). Remove fingers from the emesis basin, and dry thoroughly.
 21. Using nail clippers, clip fingernails straight across and even with the tops of fingers (see Step 21 illustration). Using a file, shape the nails straight across. If patient has circulatory problems, do not cut the nail; only file the nail.
- Assesses the adequacy of blood flow to extremities. Peripheral vascular disease can contribute to poor wound healing. Patients who are immunocompromised or who have neuropathy or peripheral vascular disease are at an increased risk of foot infections (Senthuran, 2010).
 - Prolonged positioning can cause discomfort unless normal anatomical alignment is maintained.
 - Patients with muscular weakness may have difficulty positioning their feet.
 - Softening of corns, calluses, and cuticles ensures easy removal of dead cells and easy manipulation of cuticles.
 - The orange stick removes debris under nails that harbours microorganisms. Thorough drying impedes fungal growth and prevents maceration of the tissues.
 - For infection-control purposes, use the patient's own nail clippers. Cutting straight across prevents splitting of the nail margins and the formation of sharp nail spikes that can irritate lateral nail margins. Filing prevents cutting the nail too close to the nail bed.



Step 20 Clean fingernails with the end of a cotton-tipped swab or an orange stick.

22. Push cuticle back gently with a wet facecloth. Thoroughly dry the hands.
23. Move the overbed table away from the patient.
24. Put on disposable gloves, and scrub callused areas of the feet with a washcloth.



Step 21 Using nail clippers, trim nails straight across.

- Reduces incidence of inflamed cuticles. Thorough drying impedes fungal growth and prevents maceration of the tissues.
- Provides easier access to the feet.
- Gloves prevent the transmission of fungal infection. Friction removes dead skin layers.

Continued

► SKILL 37-2 Performing Nail and Foot Care—cont'd

25. Clean gently under nails with an orange stick. Remove feet from basin, and dry them thoroughly.
 26. Clean and trim the toenails using the procedures in Steps 21 and 22. Do not file the corners of toenails.
 27. Apply lotion to feet and hands, and assist patient back to bed and into a comfortable position.
 28. Remove disposable gloves and place in a receptacle. Clean and return the equipment and supplies to the proper place. Dispose of soiled linen in a hamper. Perform hand hygiene.
 29. Inspect the nails and surrounding skin surfaces after soaking and nail trimming.
 30. Ask patient to explain or demonstrate nail care.
 31. Observe patient's walk after toenail care.
- Removal of debris and excess moisture reduces chances of infection.
 - For infection control purposes, use the patient's own nail clippers. Shaping corners of toenails may damage tissues.
 - Lotion lubricates dry skin by helping to retain moisture.
 - Reduces the transmission of infection.
 - Determines the condition of skin and nails. Allows you to note any remaining rough nail edges.
 - Evaluates patient's level of learning techniques.
 - Evaluates the level of comfort and mobility achieved.

Unexpected Outcomes

Inflammation and tenderness of cuticles and surrounding tissues

Localized areas of tenderness on feet, with calluses or corns at points of friction

Appearance of ulcer between toes or other pressure areas in foot

Related Interventions

- Repeated soakings may be needed to relieve inflammation and loosen layers of cells from calluses or corns.
- Patient with diabetes or peripheral vascular disease may require referral to a podiatrist.
- Antifungal cream may be needed.
- Change in footwear may be needed.
- Refer to a podiatrist.
- Notify physician.
- Refer to a podiatrist.
- Increase frequency of foot assessment and hygiene.

Recording and Reporting

- Document the procedure and any observations (e.g., breaks in the skin, inflammation, ulcerations) on the patient's record sheets using the forms provided by your agency or facility.
- Report any breaks in the skin or ulcerations to the person in charge or the physician. These breaks are serious in patients with diabetes, peripheral vascular disease, and illnesses that impair circulation. Special foot care treatments may be needed.

Home Care Considerations

- If the patient has diabetes or decreased peripheral circulation, alternative therapies or foot soaking should be done only after consulting with a physician.
- An alternative therapy would be moleskin applied to areas of the feet that are experiencing friction—this is less likely to cause pressure than corn pads. Spot adhesive bandages can guard against friction, but they do not have padding to protect against pressure.
- If the patient is ambulatory, instruct him or her to soak feet in a bathtub.
- If the patient's mobility is limited, a large basin or pan can be used for soaking.

- Do not wear high-heeled, open-toed, or pointed-toe shoes.
- Exercise regularly to improve circulation to the lower extremities. Walk slowly and elevate, rotate, flex, and extend the feet at the ankles. Dangle the feet over the side of the bed for one minute, then extend both legs and hold them parallel to the bed while lying supine for one minute, and, finally, rest for one minute.
- Do not apply hot water bottles or heating pads directly to the feet.
- Wash minor cuts immediately and dry them thoroughly. Use only mild antiseptics (e.g., Neosporin ointment). Contact a physician or nurse practitioner to treat cuts or lacerations (Senthuran, 2010, p. 1344; Canadian Diabetes Association, 2008; Capes, 2007).

Any patients who require regular, thorough foot care should have a caregiver or family member able to provide care during times when the patient is incapacitated. Patients with visual difficulties, physical constraints preventing movement, or cognitive problems that impair their ability to assess the condition of the feet need caregiver or family assistance.

Oral Hygiene

Oral hygiene helps to maintain the healthy state of the mouth, teeth, gums, lips, and tongue (Canadian Dental Association, 2005). Brushing cleans the teeth of food particles, plaque, and bacteria. It also massages the gums and relieves any discomfort resulting from unpleasant odours and tastes. Flossing helps to further remove plaque and bacteria from between the teeth to reduce gum inflammation and infection. Complete oral hygiene enhances well-being and comfort and stimulates the appetite.

Patients also benefit from a diet that excludes foods that promote plaque formation and tooth decay and that promotes healthy periodontal structures (Canadian Dental Association, 2005). Plaque-forming foods include carbonated beverages, breads, and starches. Oral hygiene immediately after a meal further reduces plaque. You can assist patients in maintaining good oral hygiene by teaching them the importance of correct techniques and a routine daily schedule.

Patients of all ages should be advised to have a dental checkup at least every six months. Education about common

* BOX 37-11 FOCUS ON OLDER ADULTS

- Many older adults are edentulous (without teeth), and the teeth that are present are often diseased or decayed (Meiner & Lueckenotte, 2006).
- The periodontal membrane weakens, making it more prone to infection; periodontal disease can predispose older adults to systemic infection.
- The presence of chronic illnesses (e.g., diabetes mellitus, renal insufficiency, and cardiovascular diseases) increases older adults' risk for periodontal disease (Estes & Buck, 2008; Miller, 2009).
- Dentures or partial plates may not fit properly, causing pain and discomfort; this can, in turn, affect digestive processes, the enjoyment of food, and nutritional status (Ebersole et al., 2008).
- Weaker jaw muscles and shrinkage of the bony structure of the mouth may increase the work of chewing and lead to increased fatigue when eating (Meiner & Lueckenotte, 2006).
- Dry mouth can be caused by an age-related decline in saliva secretion, as well as by over 400 medications that are frequently used by older adults (Miller, 2009; Wilson-Keates, 2009).
- Poor nutritional status in some older adults can increase the risk for and severity of dental problems (e.g., caries, periodontal disease, receding gums, and tooth degeneration) (Miller, 2009).
- An inability or unwillingness to access dental care and the belief that tooth loss is a natural outcome of aging are reasons why some older adults do not seek dental care (Ebersole et al., 2008).
- Financial limitations, low income, and lack of transportation also contribute to inadequate dental care of some older adults (Miller, 2009).



gum and tooth disorders and methods of prevention can motivate patients to follow good oral hygiene practices. Provide assistance with oral hygiene for weakened or disabled patients. When patients have variations in oral mucosal integrity, adapt hygiene techniques to ensure thorough and effective care (Box 37-11).

Brushing and Flossing. Thorough tooth brushing at least four times a day (after meals and at bedtime) is basic to an effective oral hygiene program. If patients are unable to perform oral care four times per day, they should do it at least once during the day and always at night. All tooth surfaces should be brushed thoroughly with a fluoride toothpaste. A toothbrush should have a straight handle and a brush small enough to reach all areas of the mouth. A toothbrush with soft, rounded bristles should be used to stimulate gums without causing bleeding. Toothbrushes should be replaced every three months (Canadian Dental Association, 2005). Older adult patients with reduced dexterity and grip may require an enlarged handle with an easier grip or an electric toothbrush (Miller, 2009). One simple way to make an enlarged brush handle is to pierce a soft rubber ball and push the brush handle through it or glue a short piece of plastic tubing around the handle. Commercially made foam rubber toothbrushes are useful for patients with sensitive gums. However, swabbing fails to cleanse teeth adequately because plaque accumulates around the base of the teeth. Foam rubber swabs should be used in moderation. Electric toothbrushes can be used, but consult your agency's policy to ascertain whether their use is permitted. Lemon-glycerine sponges should not be used because they dry mucous membranes and erode teeth enamel. Moi-Stir is a salivary supplement that improves moisture and the texture of the tongue and mucosa (Miller, 2009).

When teaching patients about mouth care, you should recommend that they do not share toothbrushes with family members or drink directly from a bottle of mouthwash. Cross-contamination occurs easily. The use of disclosure tablets or drops to stain the plaque that collects at the gum line can be useful for showing patients how effectively they brush.

Patients experience conditions that threaten the integrity of the oral mucosa. For example, mucosal changes associated with aging, use of chemotherapeutic drugs, or dehydration require a change in oral hygiene. More frequent mouth care and use of anti-infective agents are examples of ways you can revise approaches to meet patient needs. Unconscious patients and those with artificial airways (e.g., endotracheal or tracheal tubes) need more frequent and specialized oral hygiene. These patients have an increased risk of aspiration and, subsequently, aspiration pneumonia, and they also have more problems with dry and inflamed oral mucosa.

The amount of assistance needed by the patient when brushing the teeth may vary. Many patients can perform their own oral care and should be encouraged to do so. You should observe patients to be sure proper techniques are used. When assisting with or providing oral hygiene, you must determine the amount of assistance needed and the individuals' oral hygiene preferences (Skill 37-3).

Flossing. Dental flossing removes plaque and bacteria from between teeth. Flossing involves inserting waxed or unwaxed dental floss between all tooth surfaces, one space at a time. Flossing at least once a day is sufficient (Canadian Dental Association, 2005). To prevent bleeding, patients who are receiving chemotherapy or radiation or who are on anticoagulant therapy should use unwaxed floss and avoid vigorous flossing near the gum line. If toothpaste is applied to the teeth before flossing, this allows fluoride to come in direct contact with tooth surfaces, aiding in cavity prevention. Because it is important to clean all tooth surfaces thoroughly, you should not rush flossing. Placing a mirror in front of the patient helps you to demonstrate the proper method for holding the floss and cleaning between the teeth. Flossing a patient's teeth is not realistic or appropriate in all care settings. However, flossing may be done more frequently in rehabilitation and long-term care settings.

Patients With Special Needs. Some patients require special oral hygiene methods because of their level of dependence on the care provider or the presence of oral mucosa problems. Unconscious patients are susceptible to drying of mucous-thickened salivary secretions because they are unable to eat or drink, frequently breathe through the mouth, and often receive oxygen therapy. Unconscious patients also cannot swallow salivary secretions that accumulate in the mouth. These secretions often contain Gram-negative bacteria that can cause pneumonia if aspirated into the lungs. While providing hygiene to unconscious patients, you must protect them from choking and aspiration. While cleansing the oral cavity, you should never use your fingers to hold the patient's mouth open as a human bite is highly contaminated. It may be necessary to perform mouth care at least every two hours for the unconscious patient. Research shows that the use of chlorhexidine with oral hygiene reduces the risk of ventilator-associated pneumonia (Berry et al., 2007; Munro et al., 2006). Explain the steps of mouth care and the sensations the patient will feel, and advise the patient when the procedure is completed (Skill 37-4).

Text continued on p. 860

► SKILL 37-3 Providing Oral Hygiene

Delegation Considerations

The skill of oral hygiene can be delegated to an unregulated care provider (UCP). It is important to discuss the following with the UCP:

- How to adapt the procedure for a patient who is at risk of aspiration. (e.g., those with an impaired level of consciousness or impaired swallowing, and those who are confused).
- To immediately report excessive patient coughing or choking during or after oral hygiene
- To report any bleeding of the oral mucosa or gums, lesions, or patient report of pain
- To report any concerns with dentures (e.g., ill-fitting or broken dentures)

Procedure

STEPS

1. Determine patient's oral hygiene practices:
 - A. Frequency of tooth brushing and flossing
 - B. Type of toothpaste or dentifrice used
 - C. Last dental visit
 - D. Frequency of dental visits
 - E. Type of mouthwash or moistening preparation such as over-the-counter saliva substitutes or sugar-free gum with xylitol (Miller, 2009).
2. Assess risk for oral hygiene problems (see Table 37-5).
3. Assess patient's risk for aspiration: impaired swallowing, reduced gag reflex.
4. Assess patient's ability to grasp and manipulate a toothbrush. (For older adults, try a 30-second tooth brushing assessment.)
5. Prepare equipment at bedside.
6. Perform hand hygiene and put on disposable gloves.
7. Inspect the integrity of the lips, teeth, buccal mucosa, gums, palate, and tongue (see Chapter 31).
8. Identify the presence of common oral problems:
 - A. Dental caries—chalky white discolouration of a tooth or the presence of brown or black discolouration
 - B. Gingivitis—inflammation of gums
 - C. Periodontitis—receding gum lines, inflammation, gaps between teeth
 - D. Halitosis—bad breath
 - E. Cheilosis—cracking of the lips
 - F. Stomatitis—inflammation of the oral tissues
 - G. Dry, cracked, coated tongue
9. Explain the procedure to the patient and discuss preferences regarding the use of hygiene aids.
10. Raise the bed to a comfortable working position. Raise head of the bed (if patient's condition allows) and lower the side rail. Move the patient, or help patient move closer. A side-lying position can be used.
11. Place paper towels on an overbed table, and arrange other equipment within easy reach.
12. Place a towel over patient's chest.
13. Apply toothpaste to brush, holding brush over the emesis basin. Pour a small amount of water over toothpaste.

Equipment

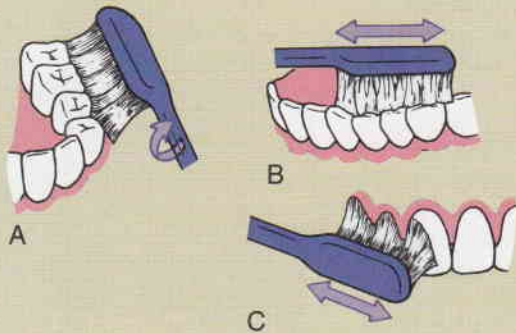
- Soft-bristled toothbrush
- Nonabrasive fluoride toothpaste or dentifrice
- Dental floss
- Water glass with cool water
- Normal saline or an essential oil antiseptic mouthwash (optional; follow patient's preference)
- Emesis basin
- Tongue blade
- Face towel
- Paper towels
- Disposable gloves

RATIONALE

- Allows you to identify errors in technique, deficiencies in preventive oral hygiene, and patient's level of knowledge regarding dental care.
- Mouthwash provides a pleasant aftertaste but can dry mucosa after extended use if it has an alcohol base.
- Certain conditions increase the likelihood of impaired oral cavity integrity and the need for preventive care.
- An accumulation of secretions and dentifrice can increase the patient's risk for aspiration if the patient's ability to control oral secretions is impaired.
- A toothbrush test is useful in assessing dexterity and strength. Determines level of assistance required.
- Avoids interrupting the procedure or leaving the patient unattended to retrieve missing equipment.
- Reduces the transmission of microorganisms.
- Determines status of patient's oral cavity and the extent of need for oral hygiene.
- Helps determine type of hygiene patient requires and information patient requires for self-care.
- Receding gums can occur with aging, and as a result older patients require meticulous oral hygiene.
- Patients receiving immunosuppressive chemotherapy (e.g., cancer chemotherapy) and patients with suppressed immune function are at risk for stomatitis (Cummings-Winfield & Olson, 2010).
- Some patients feel uncomfortable about having you care for their basic needs. Patient involvement with procedure minimizes anxiety.
- Raising the bed and repositioning the patient prevents straining of muscles. A semi-Fowler position helps prevent patient from choking or aspirating.
- Prevents soiling of the tabletop. Equipment prepared in advance ensures a smooth, safe procedure.
- Prevents soiling of bed linen and patient's clothing.
- Moisture aids in the distribution of toothpaste over tooth surfaces.

► SKILL 37-3 Providing Oral Hygiene—cont'd

14. Patient may assist by brushing. Hold toothbrush bristles at 45-degree angle to gum line (see Step 14 illustration, part A). Be sure tips of bristles rest against and penetrate under gum line. Brush inner and outer surfaces of upper and lower teeth by brushing from gum to crown of each tooth. Clean biting surfaces of teeth by holding top of bristles parallel with teeth and brushing gently back and forth (see Step 14 illustration, part B). Brush sides of teeth by moving bristles back and forth (see Step 14 illustration, part C).
15. Have patient hold brush at 45-degree angle and lightly brush over surface and sides of tongue (see Step 15 illustration). Avoid initiating gag reflex.



Step 14 Direction for toothbrush placement. A, A 45-degree angle brushes gum line. B, Parallel position brushes biting surfaces. C, Lateral position brushes sides of teeth.

16. Allow patient to rinse mouth thoroughly by taking several sips of water, swishing water across all tooth surfaces, and spitting into the emesis basin.
17. Allow patient to gargle and rinse mouth with mouthwash as desired.
18. Assist in wiping patient's mouth.
19. Allow patient to floss.
20. Allow patient to rinse mouth thoroughly with cool water and spit into emesis basin. Assist in wiping patient's mouth.
21. Ask patient whether any area of oral cavity feels uncomfortable or irritated. Inspect the oral cavity.
22. Assist patient to comfortable position, remove emesis basin and bedside table, raise side rail, and lower the bed to the original position.
23. Wipe off overbed table, discard soiled linen and paper towels in appropriate containers, remove soiled gloves, and return equipment to the proper place.
24. Remove gloves and perform hand hygiene.
25. Ask patient to describe proper hygiene techniques.

Unexpected Outcomes

Dryness and inflammation of oral mucosa

Retraction of gum margins from teeth, localized areas of inflammation, and bleeding around gum margins

Signs of dental caries

- Angle allows brush to reach all tooth surfaces and to clean under gum line where plaque and bacteria accumulate. Back-and-forth motion dislodges food particles caught between teeth and along chewing surfaces.
- Microorganisms collect and grow on tongue's surface and contribute to bad breath. Gagging may cause aspiration of toothpaste. Evaluates patient's ability to use correct technique.



Step 15 Assisting patient with brushing tongue.

- Irrigation removes food particles.
- Mouthwash can be effective in reducing plaque and gingivitis (Werner & Seymour, 2009).
- Promotes sense of comfort.
- Reduces tartar between tooth surfaces.
- Irrigation removes plaque and tartar from the oral cavity.
- Pain can indicate a problem.
- Provides for patient comfort and safety.
- Proper disposal of soiled equipment prevents the spread of microorganisms.
- Reduces the transmission of microorganisms.
- Evaluates patient's learning.

Related Interventions

- Increase frequency of oral hygiene.
- Increase patient's hydration (if permitted).
- Apply water-soluble lubricant to the patient's lips.
- Determine whether patient has an underlying bleeding tendency (e.g., anticoagulant therapy).
- Report findings to the physician or person in charge.
- Use a soft-bristled toothbrush.
- Increase frequency of oral hygiene.
- Refer patient to a dentist.
- Teach patient oral hygiene techniques.

Continued

► SKILL 37-3 Providing Oral Hygiene—cont'd

Recording and Reporting

- Record all procedures on a flow sheet provided by your agency or facility. Note the condition of the oral cavity in the patient care notes.
- Report any bleeding or the presence of lesions to the person in charge or the physician.

Home Care Considerations

- Teach the patient and caregiver to assess the oral cavity daily to determine any effects of medications on the oral cavity (e.g., reddened, inflamed gums).

► SKILL 37-4 Performing Mouth Care for an Unconscious or Debilitated Patient

Delegation Considerations

Oral hygiene of an unconscious or debilitated patient can be delegated to an unregulated care provider (UCP). You must first assess the patient for the gag reflex and determine whether the person providing assistance can safely use oral suctioning for clearing the patient's oral secretions (see Chapter 38). When delegating tasks to a UCP, it is important to instruct him or her about the following:

- The proper way to position the patient for mouth care
- How to safely use oral suctioning for clearing oral secretions (see Chapter 38)
- To report to any bleeding of the mucosa or gums, any painful reaction by the patient, or excessive coughing or choking

Equipment

- Antiseptic oral rinse (e.g., chlorhexidine gluconate [Peridex])
- Small soft-bristled toothbrush
- Sponge swab (e.g., Toothette swab) or tongue blade wrapped in a single layer of gauze
- Oral airway
- Padded tongue blade
- Face towel
- Paper towels
- Emesis basin
- Water glass with cool water
- Water-soluble lip lubricant
- Small-bulb syringe (optional)
- Suction equipment
- Disposable gloves

Procedure

STEPS

1. Assess patient's risk for oral hygiene problems (see Table 37-5).
2. Explain procedure to patient.
3. Test for the presence of a gag reflex by touching the posterior pharyngeal wall with a tongue blade.

RATIONALE

- Oral care is provided frequently to intubated patients who also have a nasogastric tube and who are at risk of aspiration, which can lead to pneumonia (Ross, 2010).
- Allows debilitated patient to anticipate procedure without anxiety. Unconscious patients retain ability to hear.
- Reveals whether patient is at risk for aspiration.

Critical Decision Point: Patients with an impaired gag reflex require oral care as well. You must determine the type of suction apparatus needed at the bedside to protect the patient's airway against aspiration.

4. Raise bed to the appropriate height; lower head of the bed (if patient's condition permits) and then lower the side rail.
 5. Pull curtain around the bed, or close the room door.
 6. Perform hand hygiene and put on disposable gloves.
 7. Place paper towels on an overbed table and arrange equipment. If needed, turn on a suction machine and connect tubing to the suction catheter.
 8. Position patient on side (Sims' position) with head turned well toward dependent side. Move patient close to side of the bed. Raise the side rail.
 9. Place a towel under patient's head and an emesis basin under the chin.
 10. Carefully separate upper and lower teeth with padded tongue blade by inserting blade, quickly but gently, between back molars. Insert blade when patient is relaxed, if possible. Do not use force (see Step 10 illustration).
- Allows use of good body mechanics and reduces the risk of injury.
 - Provides privacy.
 - Reduces the transfer of microorganisms. Gloves prevent contact with microorganisms in blood or saliva.
 - Prevents soiling of the tabletop. Equipment prepared in advance ensures a smooth, safe procedure.
 - Turning the patient's head to the side allows secretions to drain from mouth instead of collecting in the back of the pharynx. Prevents aspiration. Moving the patient close to the side of the bed facilitates proper body mechanics.
 - Prevents soiling of bed linen and patient's gown.
 - Prevents patient from biting down on your fingers and provides access to oral cavity.

Critical Decision Point: Never use fingers to separate the patient's teeth.

► SKILL 37-4 Performing Mouth Care for an Unconscious or Debililitated Patient—cont'd

11. Inspect condition of the oral cavity (see Chapter 31).
12. Clean mouth using brush or sponge Toothette swabs moistened with chlorhexidine solution if patient condition can tolerate it; otherwise, moisten with water. Clean chewing and inner and outer tooth surfaces. Swab roof of mouth, gums, and inside cheeks. Gently swab or brush tongue, but avoid stimulating gag reflex (if present). Moisten clean swab or Toothette swab with water to rinse. (Bulb syringe may also be used to rinse.) Repeat rinse several times.
13. Suction secretions as they accumulate, if necessary.
14. Apply a thin layer of water-soluble lubricant to lips (see Step 14 illustration).



Step 10 Separate upper and lower teeth with padded tongue blade.

15. Inform patient that procedure is completed.
16. Put on clean gloves, and inspect oral cavity.
17. Ask debilitated patient whether mouth feels clean.
18. Reposition patient comfortably, raise side rail as appropriate or as ordered, and return the bed to original position.
19. Clean equipment and return to its proper place. Place soiled linen in the proper receptacle.
20. Remove and discard gloves. Perform hand hygiene.
21. Assess patient's respirations on an ongoing basis.

Unexpected Outcomes

Secretions or crusts remaining on oral mucosa, tongue, or gums

Localized inflammation of gums or mucosa

Aspiration of secretions

- Determines condition of the oral cavity and the need for hygiene.
- Brushing action removes food particles between teeth and along chewing surfaces. Swabbing helps remove secretions and crusts from mucosa and moistens mucosa. Rinsing removes any debris and cleansing agent, and provides for patient comfort.
- Suction removes secretions and fluid that can collect in the posterior pharynx.
- Lubricates lips to prevent drying and cracking.



Step 14 Application of water-soluble moisturizer to lips.

- Provides meaningful stimulation to unconscious or less responsive patient.
- Determines efficacy of cleansing. Once thick secretions are removed, underlying inflammation or lesions may be revealed.
- Evaluates level of comfort.
- Maintains patient's comfort and safety. Raising all four side rails may be considered a restraint, and a physician's order is needed.
- Proper disposal of soiled equipment prevents the spread of microorganisms.
- Reduces the transmission of microorganisms.
- Ensures early recognition of aspiration.

Related Interventions

- Increase frequency of oral hygiene.
- Try using a pediatric-size toothbrush—it may provide better hygiene if the oral cavity is difficult to access.
- Increase frequency of oral hygiene with a soft-bristled toothbrush.
- Apply moisturizing gel on the oral mucosa.
- Chemotherapy and radiation can cause stomatitis. To provide relief and promote oral hygiene, topical anti-inflammatories and anaesthetics may be prescribed (Cummings-Winfield & Olson, 2010).
- Suction oral airway.
- Perform tracheal bronchial suctioning.
- Notify the physician.

Continued

► SKILL 37-4 Performing Mouth Care for an Unconscious or Debilitated Patient—cont'd

Recording and Reporting

- Record the procedure, including pertinent observations (e.g., the presence of bleeding gums, dry mucosa, ulcerations, or crusts on the tongue).
- Report any unusual findings to the person in charge or the physician.

Home Care Considerations

- Cavity should be irrigated with bulb syringe.
- Mouth care should be given at least twice a day. Caregivers can buy nonprescription oral care solutions (e.g., chlorhexidine solutions) at most pharmacies.
- Have caregivers demonstrate positioning of the patient to prevent aspiration.

► BOX 37-12 Procedural Guideline



Care of Dentures

Delegation Considerations:

The skill of denture care can be delegated to an unregulated care provider (UCP). It is important to discuss the following with the UCP:

- To report any cracks found in the dentures
- To report any patient complaints of oral discomfort
- To report any signs of irritation, inflammation, or lesions

Equipment:

- Soft-bristled toothbrush or denture toothbrush
- Denture cleaning agent or toothpaste
- Denture adhesive (optional)
- Glass of water
- Emesis basin or sink
- Washcloth
- Disposable gloves
- Denture cup (if dentures are to be stored after cleaning)

Procedure:

1. Ask patient whether dentures fit and whether the gums or mucous membranes are tender or irritated.
2. Ask patient about preferences for denture care and products used. If patient is unable to care for own dentures, you must provide this care. Clean dentures for the patient during routine mouth care.
3. Fill emesis basin with tepid water or, if using sink, place washcloth in bottom of sink and fill sink with 2.5 cm of water.
4. Remove dentures. If patient is unable to do this independently, perform hand hygiene and put on gloves, grasp upper plate at front with thumb and index finger wrapped in gauze, and pull downward. Gently lift lower denture from jaw, and rotate one side downward to remove from patient's mouth. Place dentures in emesis basin or sink.

5. Apply cleaning agent to brush and brush surfaces of dentures (see Step 5 illustration). Hold dentures close to water. Hold the brush horizontally, and use a back-and-forth motion to cleanse biting surfaces. Use short strokes from the top of the denture to biting surfaces to clean outer and inner teeth surfaces. Hold the brush vertically, and use short strokes to clean inner tooth surfaces. Hold the brush horizontally, and use a back-and-forth motion to clean the undersurface of dentures.



Step 5 Brushing dentures.

6. Rinse thoroughly in tepid water.
7. Some patients use an adhesive to seal dentures in place. If so, apply a thin layer to the undersurface before inserting.
8. If patient needs assistance with the insertion of dentures, moisten the upper denture and press firmly to seal it in place. Then insert moistened lower denture. Ask whether dentures feel comfortable.
9. Dentures should be removed at night and the gums cleaned gently. Dentures should be stored in a denture container that is labelled with the patient's name and placed in the bedside table to prevent loss.
10. Remove and discard gloves and perform hand hygiene.

Patients who receive chemotherapy, radiation, or nasogastric tube intubation or who have an infection of the mouth can suffer from stomatitis, an inflammation of the oral mucosa that can cause burning, pain, and a change in food tolerance. Gentle brushing and flossing are important in preventing bleeding of the gums. Patients should be advised to avoid alcohol and commercial mouthwash and to stop smoking. Normal saline rinses (approximately 30 mL) used upon awaking in the morning, after each meal, and at bedtime can effectively clean the oral cavity. The rinses can be increased to every two hours, if necessary. The physician or nurse practitioner may order a mild oral analgesic for pain control.

Patients with diabetes mellitus frequently have periodontal disease and should have regular, yearly (or more frequently if necessary) visits to the dental professional for oral health assessment and care. All tissues should be handled gently with a minimum of trauma. Patients should learn to follow rigid cleansing schedules, at least four times a day.

Denture Care. Patients should be encouraged to clean their dentures on a regular basis to avoid gingival infection and irritation. When patients become disabled, the care provider or family caregiver can assume responsibility for denture care (Box 37-12). Dentures are patients' personal property and need to be handled with care because they can be easily broken.

They must be removed at night to give the gums a rest and prevent bacterial buildup. Dentures should be kept covered in water when they are not worn to prevent warping, and they should always be stored in an enclosed, labelled cup and placed in a patient's bedside stand. Discourage patients from removing dentures and placing them on a napkin or tissue because they could be easily thrown away.

Hair and Scalp Care

A person's appearance and feeling of well-being can often depend on the way his or her hair looks and feels. Illness or disability may prevent patients from maintaining daily hair care. Immobilized patients' hair soon becomes tangled. Dressings may leave sticky blood or antiseptic solutions on the hair. In the clinic and home care setting, you may encounter patients who have head lice. Proper hair care is important to patients' body image. Brushing, combing, and shampooing are basic hair hygiene measures for all patients.

Brushing and Combing. Frequent brushing and combing helps to keep hair clean and distributes oil evenly along hair shafts and prevents hair from tangling. Patients should be encouraged to maintain routine hair care. However, patients with limited mobility or weakness and those who are confused require assistance. Patients in a hospital or long-term care facility appreciate the opportunity to have their hair brushed and combed before being seen by others.

When caring for patients from different cultures, it is important to learn as much as possible from them or their family about their preferred hair care practices. Cultural preferences affect how hair is combed and styled.

Long hair can easily become matted when patients are confined to bed, even for a short period. When lacerations or incisions involve the scalp, blood and topical medications can also cause tangling. Frequent brushing and combing keeps long hair neatly groomed. Braiding can help to avoid repeated tangles; however, braids should be unbraided periodically and the hair combed to ensure good hygiene. Braids made too tightly can result in bald patches. Always obtain permission from the patients, if conscious, before braiding their hair.

To brush the hair, part it into two sections and separate each into two more sections. It is easier to brush smaller sections of hair. Brushing from the scalp toward the hair ends minimizes pulling. Moistening the hair with water frees tangles for easier combing. Never cut a patient's hair without verbal or written consent if they are cognitive and able to give consent.

Patients who develop head lice require special considerations in the way combing is performed. The lice are small, about the size of a sesame seed. Bright light or natural sunlight is necessary for the lice to be seen. Thorough combing is recommended and may remove nits (empty eggshells) if infestation is extensive. Follow these steps:

- Put on a disposable gown and gloves.
- Use a grooming comb or hairbrush to remove any tangles.
- Divide the patient's hair in sections and fasten off the hair that is not being combed.
- Comb out from the scalp to the end of the hair (special fine-tooth combs are available in drugstores).
- Between each pass, dip the comb in a cup of water or use a paper towel to remove nits.
- After combing, look through the hair carefully for attached live lice.
- Catch live lice with tweezers or comb.
- Move to next section of hair after combing thoroughly.

- Instruct the family to clean the comb with an old toothbrush and dental floss and boil the comb (if possible). The ideal would be to discard the comb after each use, but some patients' financial situations may prevent the purchase of multiple combs.
- Instruct the family to comb and screen for lice daily.
- Instruct the family to contain the patient's clothes and then wash them in hot water.
- Instruct caregivers on how to prevent the transmission of lice:
 - Do not share bed linens.
 - Avoid placing your bare hand on patient's head.
 - Immediately wash your hands after providing hair care.
 - Contain all hair care products.

If a pediculicidal shampoo is ordered, instruct the patient and caregiver on the proper use of shampoo. Lindane, an organochloride, can have neurological side effects. Shampoos containing lindane are contraindicated for those patients under 50 kg, neonates, those who take medications that lower seizure threshold (e.g., tricyclic antidepressants), and patients who have human immunodeficiency virus (HIV) (Brophy et al., 2008; Frankowski et al., 2010). As with any medication preparation, it is important to review and understand the product information provided in the packaging.

Shampooing. To best promote and restore hair and scalp health, patients should be instructed to keep hair clean, combed, and brushed regularly. Patients may also need to know how to check for and remove parasites, such as lice (see Table 37-4). You should inform patients that they need to notify their primary caregiver of changes in the texture and distribution of hair, which may indicate a serious systemic problem.

Frequency of shampooing depends on patients' daily routines and the condition of their hair. You should remind patients in hospitals or long-term care facilities that staying in bed, perspiring excessively, or undergoing treatments that leave blood or solutions in the hair may result in a need for more frequent shampooing.

For patients at home who have limited mobility, it is challenging to find ways that they can shampoo their hair without causing injury. If patients are able to take a shower or bath, their hair can usually be shampooed without difficulty. A shower or tub chair may be used for ambulatory, weight-bearing patients who become fatigued or faint. Hand-held shower nozzles allow patients to easily wash their hair in the tub or shower. Patients allowed to sit in a chair may choose to be shampooed in front of a sink or over a wash basin. However, bending is limited or contraindicated in certain conditions (e.g., eye surgery or neck injury). In these situations, you need to teach the patients and their family members the degree of bending allowed.

If patients are unable to sit but can be moved, you may transfer them to a stretcher for transportation to a sink or shower equipped with a hand-held nozzle. This equipment is commonly found in long-term care facilities. Caution is again needed when the patients' head and neck are positioned, particularly in patients with any form of head or neck injury.

If patients are unable to sit in a chair or be transferred to a stretcher, shampooing must be done while the patients are in bed (Box 37-13). A special shampoo trough can be positioned under the patient's head to catch water and suds. After shampooing, patients like having their hair styled and dried. Dry shampoos that reduce the need to wet the patients' hair are also available but are not highly effective. These dry shampoos

► BOX 37-13 Procedural Guideline

video

Shampooing the Hair of a Bed-Bound Patient**Delegation Considerations:**

The skill of shampooing hair can be delegated to an unregulated care provider (UCP). It is important to discuss the following with the UCP:

- To follow any precautions necessary in positioning the patient
- To report any patient complaints of neck pain
- To report condition of the scalp and hair

Equipment:

- Bath towels
- Washcloths
- Shampoo
- Hair conditioner (if available)
- Water pitcher with warm water
- Plastic shampoo trough
- Wash basin
- Bath blanket
- Waterproof pad
- Clean comb and brush
- Hair dryer (if warranted by patient's condition)
- Disposable gloves (optional)

Procedure:

1. Before washing the patient's hair, ensure that this procedure is not contraindicated for the patient. Certain medical conditions, such as head and neck injuries, spinal cord injuries, and arthritis, could place the patient at risk for injury during shampooing because of positioning and manipulation of the patient's head and neck.
2. Put on gloves if needed. Inspect the hair and scalp before initiating the procedure to determine the presence of any conditions that may require the use of special shampoos or treatments (e.g., for dandruff or the removal of dried blood).
3. Place waterproof pad under patient's shoulders, neck, and head (see Step 3 illustration). Position patient supine, with head and shoulders at top edge of the bed. Place a plastic trough under patient's head and a wash basin at end of trough. Be sure the trough spout extends beyond the edge of the mattress.



Step 3 Pad has been placed under shoulders, neck, and head.

4. Place rolled towel under patient's neck and bath towel over patient's shoulders.
5. Brush and comb patient's hair.
6. Obtain warm water.
7. Offer patient the option of holding a face towel or washcloth over the eyes.
8. Slowly pour water from a water pitcher over hair until it is completely wet (see Step 8 illustration). If hair contains matted blood, don gloves, apply peroxide to dissolve the clots, and then rinse the hair with saline. Apply small amount of shampoo.



Step 8 Pour water over hair.

9. Work up lather with both hands. Start at the hairline and work toward back of the neck. Lift head slightly with one hand to wash back of the head. Shampoo sides of the head. Massage scalp by applying pressure with fingertips, if not contraindicated.
10. Rinse hair with water. Make sure water drains into basin. Repeat rinsing until hair is free of soap.
11. Apply conditioner or cream rinse, if requested, and rinse hair thoroughly.
12. Wrap patient's head in bath towel. Dry patient's face with cloth used to protect eyes. Dry off any moisture along the neck or shoulders.
13. Dry patient's hair and scalp. Use a second towel if first becomes saturated.
14. Comb hair to remove tangles, and dry with dryer if desired (not available in all agencies or facilities).
15. Apply oil preparation or conditioning product to hair, if desired by patient.
16. Assist patient to a comfortable position, and complete styling of hair.

preparations vary, and the application procedures, listed on the container, should be followed exactly. In some agencies, a physician's or nurse practitioner's order is necessary to shampoo the dependent patient.

Shaving. Shaving facial hair can be done after a bath or shampoo. Women may prefer to shave their legs or axillae while bathing. When assisting a patient, you should take care to avoid cutting the patient with a razor blade. Patients prone to bleeding (e.g., those receiving anticoagulants or high doses of aspirin, those with low platelet counts) must use an electric razor. Before the use of an electric razor, you should check for frayed cords and other electrical hazards, as well as your agency's policy with respect to the use of these razors. Each razor blade or electric razor should be used on only one patient because of infection-control considerations.

Before a razor blade is used for shaving, the skin must be softened to prevent pulling, scraping, or cuts. Place a warm washcloth over the male patient's face for a few seconds, then apply shaving cream or lather a mild soap to soften the skin. If the patient is unable to shave, you may perform the task. To avoid causing discomfort or razor cuts, gently pull the skin taut and use short, firm razor strokes in the direction in which the hair grows (Figure 37-9). Short downward strokes work best to remove hair over the upper lip. A patient usually can explain the best way to move the razor across the skin. In dark-skinned patients, facial hair tends to be curly and can become ingrown unless shaved close to the skin.

Moustache and Beard Care

Patients with moustaches or beards require daily grooming. Keeping these areas clean is important because food particles and mucus can easily collect in the hair. If the patient is unable to carry out self-care, you must perform this care for the patient. Beards can be gently combed out. A shaggy or unkempt moustache or beard can be trimmed, with consent from the patient or family. For cultural or religious reasons, trimming or shaving off a moustache or beard cannot be performed without the patient's or family's consent.



Figure 37-9 Shave in the direction of hair growth. Use longer strokes on the larger areas of the face. Use short strokes around the chin and lips. **Source:** Sorrentino, S. A. (2004). *Assisting with patient care* (2nd ed., p. 320, Fig 17-5). St Louis, MO: Mosby.

Care of the Eyes, Ears, and Nose

Special attention is given to cleansing the eyes, ears, and nose during a routine bath and when drainage or discharge accumulates. This aspect of hygiene not only makes patients more comfortable, it also improves sensory reception (see Chapter 47). Care focuses on preventing infection and maintaining normal sensory function and requires approaches that consider patients' special needs.

Basic Eye Care. Cleansing the eyes simply involves washing them with a clean washcloth moistened in water. Soap may cause burning and irritation (see Skill 37-1). Direct pressure should never be applied over the eyeball because it may cause serious injury. When cleansing a patient's eyes, use a clean washcloth and cleanse from the inner to outer canthus. Use a different section of the washcloth for each eye. Unconscious patients often require more frequent eye care.

Secretions may collect along the lid margins and inner canthus when the blink reflex is absent or an eye does not close completely. It may be necessary to place an eye patch over the involved eye to prevent corneal drying and irritation. Lubricating eye drops may be given according to the physician's or nurse practitioner's orders.

Eyeglasses. Glasses are made of hardened glass or plastic that is impact-resistant to prevent shattering. Nevertheless, because of their cost, extra care should be taken when cleaning glasses and they should be protected from breakage or other damage when they are not worn. Glasses should be put in a case in a drawer of the bedside table when not in use and labelled with the patient's name.

Cool water is sufficient for cleaning glass lenses. A soft cloth is best for drying to prevent scratching the lens; paper towels can scratch a lens. Plastic lenses in particular are scratched easily, and special cleansing solutions and drying cloths are available for them. Use whatever the patient's eye care specialist recommends.

Contact Lenses. A contact lens is a small, round, transparent, and sometimes coloured disc that fits directly over the cornea of the eye. Contact lenses are designed specifically to correct refractive errors of the eye or abnormalities in the cornea's shape. They are relatively easy to apply and remove.

Contact lenses are available in daily-wear, extended-wear, and disposable varieties. All lenses must be removed periodically to prevent ocular infection and corneal ulcers or abrasions. Patient education must include a discussion of proper lens care techniques in order to avoid microbial infections (e.g., keratitis) (Wu et al., 2010) (Box 37-14).

Daily-wear lenses should be removed overnight for cleaning and disinfecting; extended-wear lenses can be worn for up to 30 days without being removed (Health Canada, 2006). Disposable lenses are available in daily-wear and extended-wear varieties. Extended-wear disposable lenses are usually replaced every one to two weeks. Pain, tearing, discomfort, and redness of the conjunctivae may be symptoms of lens overwear. The persistence of symptoms after lens removal may indicate serious ocular injury.

Contact lenses accumulate secretions and foreign matter while they are being worn. These materials deteriorate and then irritate the eye, causing distorted vision and the risk for infection. Contact lenses should be cleaned and thoroughly disinfected once removed. Patients should be cautioned to never use saliva, homemade saline, or tap water when cleaning lenses as these solutions may contain microorganisms that can cause serious infections.

* BOX 37-14 PATIENT TEACHING

Contact Lens Care

Objectives

- Patient will be able to identify warning signs of corneal irritation and eye infection.
- Patient will be able to clean and care for contact lenses correctly.

Teaching Strategies

Encourage the patient to see a vision care specialist (ophthalmologist or optometrist) regularly:

- For low-risk patients: birth to 24 months, by age 3 months; age 2–5 years, prior to attending school; age 6–19 years, annually; age 20–64 years, every 1–2 years; and over age 65 years, annually; the vision care specialist will determine the frequency for high-risk patients (Alberta Association of Optometrists, n.d.)
- Teach the patient the following facts about contact lens care:
 - Special cleaning solutions should be used when cleaning and disinfecting contact lenses.
 - Never use fingernail on a lens to remove dirt or debris that does not loosen during washing with cleaning solutions.
 - Follow the recommendations of lens manufacturer or your eye care practitioner when cleaning and disinfecting lenses.
 - Remember the mnemonic RSVP: redness, sensitivity, vision problems, and pain (Health Canada, 2006). If one of these problems occurs, remove the contact lenses immediately. If problems continue, contact a vision care specialist.
 - Lenses become very slippery once cleaning solution is applied.
 - If a lens is dropped on a hard surface, moisten your finger with the cleaning or wetting solution and gently touch the lens to pick it up. Then clean, rinse, and disinfect the lens.
 - Lenses should be kept moist or wet when not worn.
 - Use fresh solution daily when storing and disinfecting lenses.
 - Do not wipe the lens with a tissue or towel.
 - Thoroughly wash and rinse the lens storage case on a daily basis. Clean it periodically with soap or liquid detergent; rinse it thoroughly with warm water and air-dry it.
 - To avoid a mix-up, always start with the same lens when removing or inserting lenses.
 - Throw away disposable or planned replacement lenses after the prescribed wearing period.

Evaluation

- Ask the patient to identify the warning signs of corneal irritation and eye infection.
- Ask the patient to describe methods of improper contact lens handling that can lead to infection.
- Ask the patient to describe the techniques required to clean and store contact lenses.

Artificial Eyes. Patients with artificial eyes have had an **enucleation**, or removal, of an entire eyeball as a result of a tumour growth, severe infection, or eye trauma. Some artificial eyes are permanently implanted, whereas others can be removed for routine cleaning. Patients with an artificial eye usually prefer to care for their own eye. You should respect the patient's wishes and assist by assembling needed equipment.

Patients may at times require assistance in prosthesis removal and cleansing. To remove an artificial eye, you retract the lower eyelid and exert slight pressure just below the eye (Figure 37-10). This action causes the artificial eye to rise from

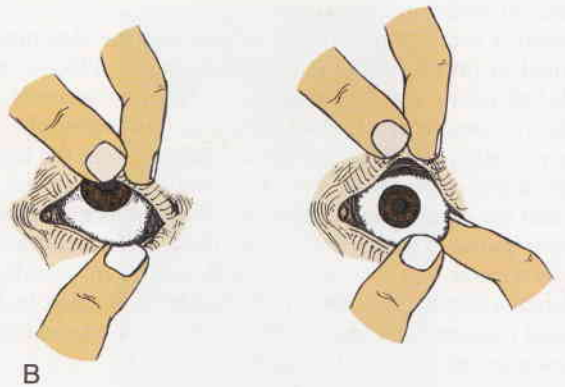
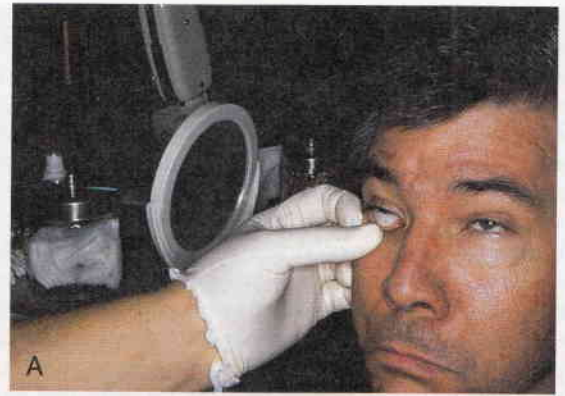


Figure 37-10 Removal of a prosthetic eye.

the socket because the suction holding the eye in place has been broken. You may also use a small rubber bulb syringe or medicine dropper bulb to create a suction effect. The suction created by placing the bulb tip directly over the eye and squeezing lifts the artificial eye from the socket.

The artificial eye is usually made of glass or plastic. You use warm normal saline to cleanse the prosthesis. You should also cleanse the edges of the eye socket and surrounding tissues with soft gauze moistened in saline or clean tap water. Signs of infection should be reported immediately because bacteria can spread to the neighbouring eye, underlying sinuses, or even underlying brain tissue. To reinsert the eye, retract the upper and lower lids and gently slip the eye into the socket, fitting it neatly under the upper eyelid. An artificial eye may be stored in a labelled container filled with tap water or saline.

Ear Care. Routine ear care involves cleansing the ear with the end of a moistened washcloth, rotated gently into the ear canal. When cerumen is visible, a gentle, downward retraction at the entrance of the ear canal may cause the cerumen to loosen and slip out. You should warn patients never to use sharp objects such as bobby pins or paper clips to remove cerumen as this can traumatize the ear canal and rupture the tympanic membrane. Use of cotton-tipped applicators should also be avoided because they can cause cerumen to become impacted within the canal.

Children and older adults commonly have impacted cerumen. Excessive or impacted cerumen can usually be removed only by irrigation, which usually requires a physician's or nurse practitioner's order. If a patient has a history of a perforated eardrum or if perforation is discovered during assessment, the procedure is contraindicated. Before irrigation,

instill three drops of glycerine at bedtime to soften the cerumen and three drops of hydrogen peroxide twice a day to loosen the cerumen. Then irrigation with approximately 250 mL of warm water (at 37°C) into the ear canal mechanically washes away loosened cerumen. The use of cold or hot water can cause nausea or vomiting.

The patient may sit or lie on his or her side with the affected ear up. Place a small curved basin under the affected ear to catch the irrigating solution. You can use a bulb-irrigating syringe. The tip of the syringe should not occlude the ear canal to avoid exerting pressure against the tympanic membrane. Direct a gentle irrigation at the top of the canal to loosen the cerumen from the sides of the canal. After the canal is clear, wipe off any moisture from the ear and inspect the canal for remaining cerumen.

Hearing Aid Care. Hearing aids are instruments made up of miniature parts working together as a system to amplify sound in a controlled manner. Aids receive normal low-intensity sound inputs and deliver them to the ear as louder outputs. The new class of hearing aids can reduce background noise interference. Computer chips placed in the aids allow for fine adjustments to a specific patient's hearing needs. Hearing aids are used by both hard-of-hearing individuals (those with a slight or moderate hearing loss) and deaf individuals (those with severe or profound hearing loss). While mechanical dysfunction of the external or middle ear causes conductive hearing loss, which could be due to impacted cerumen or a foreign body that obstructs the transmission of sound, sensorineural (perceptive) hearing loss indicates a pathology in the inner ear, cranial nerve VII damage, or presbycusis (gradual nerve degeneration that occurs with aging) (MacDonald-Jenkins, 2009a). Although cochlear implants in children with significant hearing loss are becoming more widely available, there is no statistical information available regarding the number of children in Canada who have received cochlear implants (Fitzpatrick & Brewster, 2008). In 2010, Fitzpatrick and Brewster (2010) also undertook a survey that examined the growing use of cochlear implantation for adults. According to their results, by 2007, 2534 adults had received cochlear implants in Canada. Resource allocation and access were two of the major concerns identified in their survey with respect to the number of adult cochlear implantation surgeries.

Three popular types of hearing aids are available. An *in-the-canal (ITC) aid* is the newest, smallest, and least visible hearing aid and fits entirely in the ear canal. It has cosmetic appeal, is easy to manipulate and place in the ear, does not interfere with wearing eyeglasses or using the telephone, and can be worn during most physical exercise. However, it requires an adequate ear diameter and depth for proper fit. It does not accommodate progressive hearing loss, and it requires manual dexterity to operate, insert, remove, and change the batteries. Also, cerumen tends to plug this model more than the other models.

An *in-the-ear (ITE, or intra-aural) aid* (Figure 37-11, A) fits into the external auditory canal and allows for better fine-tuning. It is more powerful and stronger than the ITC aid and therefore is useful for a wider range of hearing loss. It is easy to position and adjust and does not interfere with wearing eyeglasses. It is, however, more noticeable than the ITC aid and is not recommended for persons with moisture or skin problems in the ear canal.

A *behind-the-ear (BTE, or postaural) aid* (Figure 37-11, B) hooks around and behind the ear and is connected by a short,

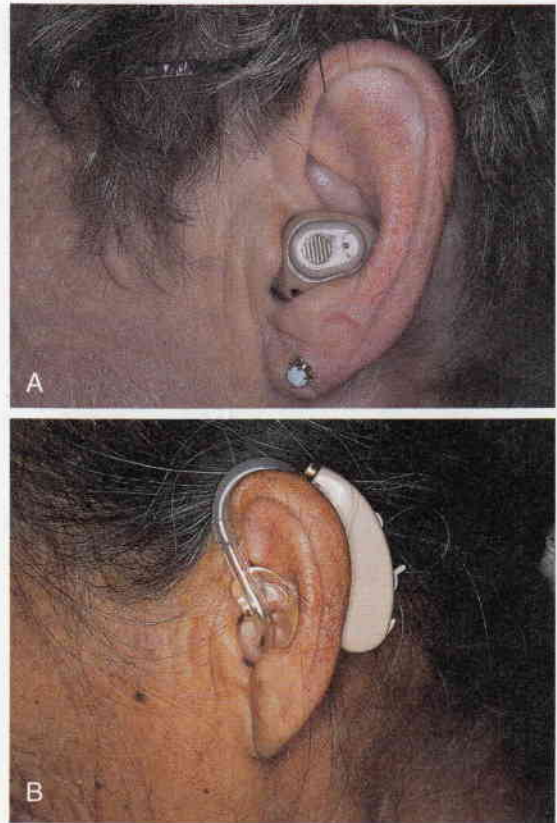


Figure 37-11 Two common types of hearing aids. A, In the ear. B, Behind the ear.

clear, hollow plastic tube to an ear mould inserted into the external auditory canal. It allows for fine-tuning. It is the largest of the three aids and is useful for patients with rapidly progressive hearing loss or manual dexterity difficulties and those who find partial ear occlusion intolerable. Disadvantages are that it is more visible, may interfere with wearing eyeglasses and using a phone, and is more difficult to keep in place during physical exercise. Box 37-15 reviews patient education guidelines for the care and use of a hearing aid.

Nasal Care. The patient can usually remove secretions from the nose by gently blowing into a soft tissue. Caution the patient against harsh blowing; this can create pressure capable of injuring the eardrum, nasal mucosa, and even sensitive eye structures. Bleeding from the nares is a sign of harsh blowing.

If the patient is unable to remove nasal secretions, assist by using a wet washcloth or a cotton-tipped applicator moistened in water or saline. The applicator should never be inserted beyond the length of the cotton tip. Excessive nasal secretions can also be removed by gentle suctioning.

When patients have a nasogastric, feeding, or endotracheal tube inserted through the nose, you should change the tape anchoring when soiled or if it becomes loose. When tape becomes moist from nasal secretions, the skin and mucosa can easily become macerated. Friction from the tube can cause tissue sloughing. After carefully removing the tape, maintain your hold of the tubing and thoroughly cleanse and dry the nasal surface (see Chapter 42).

► BOX 37-15 Care and Use of Hearing Aids

- Initially wear a hearing aid for short periods; then gradually increase the wearing time to 10–12 hours.
- Once inserted, turn the aid slowly to one-third to one-half volume.
- Remember that a whistling sound indicates too high a volume, incorrect ear mould insertion, an improper fit of the aid, or a buildup of earwax or fluid.
- Adjust the volume to a comfortable level for talking at a distance of 1 m.
- Do not wear the aid under heat lamps, while using a hair dryer, or in very wet, cold weather.
- Keep in mind that batteries can last 70–85 hours—one week with daily wearing of 10–12 hours.
- Remove or disconnect the battery when not in use.
- Replace ear moulds every 2–3 years.
- Routinely check the battery compartment: Is it clean? Are batteries inserted properly? Is the compartment shut all the way?
- Remember that dials on the hearing aid should be clean and easy to rotate, creating no static during adjusting.
- Keep the aid clean.
- Aids are usually cleaned with a soft cloth and warm soapy water; see the manufacturer's instructions.
- Avoid the use of hairspray and perfume while wearing the hearing aid; the residue from the spray can cause the aid to become oily and greasy.
- Do not submerge the aid in water.
- Routinely check the cord or tubing (depending on type of aid) for cracking, fraying, and poor connections.
- Follow up with an audiologist routinely to evaluate the effectiveness of the current aid.
- Remember that the frequencies of newer computerized hearing aids can be easily adjusted.

Data from Ebersole, P., Hess, P., Touhy, T. A., Jett, K., & Luggen, A. (2008). *Toward healthy aging: Human needs and nursing response* (7th ed.). St Louis, MO: Mosby; Eliopoulos, C. (2005). *Gerontological nursing* (6th ed.). Philadelphia, PA: Lippincott Williams & Wilkins; and Miller, C. A. (2009). *Nursing for wellness in older adults* (5th ed.). Philadelphia, PA: Lippincott Williams & Wilkins.

Patient's Room Environment

Attempting to make a patient's room as comfortable as possible is an important priority. The patient's room should be comfortable, safe, and large enough to allow the patient and visitors to move about freely. Room temperature and ventilation are difficult to control; however, noise and odours can be controlled to create a more comfortable environment. Keeping the room neat and orderly also contributes to the patient's sense of well-being.

Maintaining Comfort. The nature of what constitutes a comfortable environment depends on the patient's age, severity of illness, and level of daily activity. Depending on the patient's age and physical condition, the room temperature should be maintained between 20°C and 23°C, if possible. Infants, older adults, and the acutely ill may need a warmer room. However, certain acutely ill patients (e.g., patients with head injuries) benefit from cooler room temperatures to lower the body's metabolic demands.

A good ventilation system keeps stale air and odours from lingering in the room. The acutely ill, infants, and older adults



Figure 37-12 A typical hospital room.

must be protected from drafts by ensuring that they are adequately dressed and covered with a lightweight blanket.

Good ventilation also reduces lingering odours caused by draining wounds, vomitus, bowel movements, and unemptied urinals. Room deodorizers can help remove many unpleasant odours but should be used with discretion in consideration of the patient's possible embarrassment. Before using room deodorizers, it is important to determine that the patient is not allergic or sensitive to the deodorizer itself. Bedpans and urinals should be emptied and rinsed promptly. Thorough hygiene measures are the best way to control body or breath odours.

Ill patients seem to be more sensitive to common hospital noises (e.g., IV pump alarms, suction apparatus, or stretchers exiting an elevator). You should explain the source of any unfamiliar noise to the patient and family members. Until the patient is familiar with hospital noises, the noise level should be controlled as much as possible. This can also help the patient sleep (see Chapter 40).

Proper lighting is necessary for everyone's safety and comfort. A brightly lit room is usually stimulating, and a darkened room is best for rest and sleep. Room lighting can be adjusted by closing or opening drapes, regulating overbed lights, and closing or opening room doors. When entering a patient's room at night, refrain from abruptly turning on an overhead light unless necessary.

Room Equipment. Although variations in hospital rooms exist across health care settings, a typical hospital room contains the following basic pieces of furniture: an overbed table, a bedside stand, chairs, and a bed (Figure 37-12). Long-term care and rehabilitation facilities may have similar equipment. The overbed table rolls on wheels and can be adjusted to various heights over the bed or a chair. The table provides an ideal working space for performing procedures. It also provides a surface on which to place meal trays, toiletry items, and objects frequently used by the patient. The bedpan and urinal should not be placed on the overbed table. The bedside stand is used to store the patient's personal possessions and hygiene equipment. A telephone (if supplied), water pitcher, and drinking cup are commonly found on top of the bedside stand.



Figure 37-13 Instruct patient in use of call light and bed controls.

Most hospital rooms contain an armless straight-backed chair or an upholstered lounge chair with arms. Straight-backed chairs are convenient to use when temporarily transferring the patient from the bed, such as during bed making. Lounge chairs tend to be more comfortable when a patient is willing and able to sit for an extended period.

Each room usually has an overbed light. Additional portable lighting can be used to provide extra light during bedside procedures. Other equipment usually found in a patient's room is a call bell, a television set (not available in all agencies and facilities), a wall-mounted blood pressure gauge, oxygen and vacuum wall outlets, and personal-care items. Special equipment designed for comfort or positioning patients includes foot boots, special mattresses, and bed boards (see Chapters 45 and 46). Check your agency's policy and the manufacturers' directions before using comfort and positioning equipment.

Beds. Seriously ill patients may remain in bed for a long time. Because a bed is the piece of equipment used most by a hospitalized patient, it should be designed for comfort, safety, and adaptability for changing positions. The typical hospital bed has a firm mattress on a metal frame that can be raised and lowered horizontally. Many hospitals are converting the standard hospital bed to one in which the mattress surface can be electronically adjusted for patient comfort. Different bed positions are used to promote patient comfort, minimize symptoms, promote lung expansion, and improve access during certain procedures (Table 37-6).

The position of a bed is usually changed by electrical controls incorporated into the patient's call light and in a panel on the side or foot of the bed (Figure 37-13). However, some facilities do have hospital beds that are manually controlled. It is important to become familiar with the use of the bed controls. Ease in raising and lowering a bed and in changing the position of the bed head and foot eliminates undue musculoskeletal strain on the care provider. Instructions should be provided to the patients on the proper use of controls; caution them against raising the bed to a position that might cause harm.

Beds contain safety features such as locks on the wheels or casters, and alarms. Wheels should be locked when the bed is stationary to prevent accidental movement. Alarms should be turned on to protect patients at risk for falls when getting out

TABLE 37-6 Common Bed Positions

Position	Description	Uses
Fowler's	Head of bed raised to angle of 45 degrees or more; semisitting position; foot of bed may also be raised at knee	Is preferred while patient eats Is used during nasogastric tube insertion and nasotracheal suction Promotes lung expansion
Semi-Fowler's	Head of bed raised approximately 30 degrees; inclination less than Fowler's position; foot of bed may also be raised at knee	Promotes lung expansion Is used when patients receive gastric feedings to reduce regurgitation and risk of aspiration
Trendelenburg's	Entire bed frame tilted with head of bed down	Is used for postural drainage Facilitates venous return in patients with poor peripheral perfusion
Reverse Trendelenburg's	Entire bed frame tilted with foot of bed down	Is used infrequently Promotes gastric emptying Prevents esophageal reflux
Flat	Entire bed frame horizontally parallel with floor	Is used for patients with vertebral injuries and in cervical traction Is used for patients who are hypotensive Is generally preferred by patients for sleeping

of bed without assistance. Side rails protect patients from accidental falls. The headboard can be removed from most beds. This is important when the medical team must have easy access to the patient's head, such as during cardiopulmonary resuscitation.

Bed Making. A patient's bed should be kept clean and comfortable. This requires frequent inspections to be sure linen is clean, dry, and free of wrinkles. When patients are diaphoretic, have draining wounds, or are incontinent, you should check frequently for soiled linen.

The bed is usually made in the morning after the patient's bath or while the patient is in the shower, sitting in a chair

eating, or out of the room for procedures or tests. Throughout the day, bed linens should be straightened when they become loose or wrinkled. The bed linen should also be checked for food particles after meals and for wetness or soiling. Linens that are soiled or wet should be changed.

When changing bed linen, follow the principles of medical asepsis by keeping soiled linen away from your uniform (Figure 37-14). Soiled linen is placed in special linen bags before discarding it in a hamper. To avoid air currents, which can spread microorganisms, bed linens should never be shaken. To avoid transmitting infection, do not place soiled linen on the floor. If clean linen touches the floor, it should be immediately discarded.

During bed making, use proper body mechanics (see Chapter 35). You should always raise the bed to the appropriate height before changing linen so that you do not have to bend or stretch over the mattress. You should also move back and forth to opposite sides of the bed while putting on new linen. Body mechanics is also important when turning or repositioning the patient in bed.

When patients are confined to a bed, organize bed-making activities to conserve time and energy (Skill 37-5). The patient's privacy, comfort, and safety are all important. To help promote comfort and safety, use side rails to aid positioning and turning,

keep a call light within the patient's reach, and maintain the proper bed position. After making a bed, always return it to the lowest horizontal position to prevent accidental falls should the patient get in and out of the bed alone.

Text continued on p. 873



Figure 37-14 Holding linen away from the uniform prevents contact with microorganisms.

► SKILL 37-5 Making an Occupied Bed

Delegation Considerations

The skill of making an occupied bed can be delegated to an unregulated care provider (UCP). It is important to discuss the following with the UCP:

- Any precautions or activity restrictions for the patient
- What to do if wound drainage, dressing material, drainage tubes, or IV tubing becomes dislodged or is found in the linens
- What to do if the patient becomes fatigued

Equipment

See Figure 37-15.

- Linen bag(s)
- Bottom sheet (flat or fitted)
- Drawsheet (optional)
- Top sheet
- Blanket
- Bedspread
- Waterproof pads or soaker pad (optional)
- Pillowcases
- Bedside chair or table
- Disposable gloves (optional)
- Towel
- Disinfectant

Procedure

STEPS

1. Assess potential for patient incontinence or excess drainage on bed linen.
2. Check chart for orders or specific precautions concerning movement and positioning.
3. Explain procedure to the patient, noting that he or she will be asked to turn on side and roll over linen.
4. Perform hand hygiene and put on gloves. (Gloves are worn only if linen is soiled or if contact with body secretions is possible.)
5. Assemble equipment and arrange it on a bedside chair or table. Remove unnecessary equipment such as a dietary tray or items used for hygiene.
6. Draw room curtain around bed or close room door.
7. Adjust bed height to a comfortable working position. Lower any raised side rail on one side of bed. Remove the call light.
8. Loosen top linen at foot of the bed.

RATIONALE

- Determines the need for protective waterproof pads or extra bath blankets on the bed.
- Ensures patient safety and the use of proper body mechanics.
- Minimizes anxiety and promotes cooperation.
- Reduces the transmission of microorganisms.
- Assembling all equipment provides for a smooth procedure and assists in increasing patient's comfort. Placing linen on clean surface minimizes spread of infection.
- Maintains patient's privacy.
- Minimizes strain on the back. It is easier to remove and put on linen evenly with bed in a flat position. Provides easy access to bed and linen.
- Makes linen easier to remove.

SKILL 37-5 Making an Occupied Bed—cont'd

9. Remove bedspread and blanket separately. If bedspread and blanket are soiled, place them in a linen bag. Keep soiled linen away from your uniform.
 10. If blanket and bedspread are to be reused, fold them by bringing the top and bottom edges together. Fold the farthest side over onto nearer bottom edge. Bring top and bottom edges together again. Place folded linen over back of chair.
 11. Cover patient with a bath blanket in the following manner: Unfold bath blanket over top sheet. Ask patient to hold top edge of the bath blanket. If patient is unable to help, tuck top of bath blanket under patient's shoulder. Grasp top sheet under bath blanket at patient's shoulders and bring sheet down to foot of bed. Remove the sheet and discard in a linen bag.
 12. With assistance from another, slide mattress toward head of the bed.
 13. Position the patient on the far side of the bed, turned onto his or her side and facing away from you. Be sure side rail in front of patient is up. Adjust pillow under patient's head.
 14. Loosen bottom linens, moving from head to foot. With seam side down (facing the mattress), fanfold bottom sheet and drawsheet toward patient—first drawsheet, then bottom sheet. Tuck edges of linen just under buttocks, back, and shoulders. Do not fanfold mattress pad if it is to be reused (see Step 14 illustration).
 15. Wipe off any moisture on exposed mattress with towel and appropriate disinfectant.
 16. Put on clean linen to exposed half of the bed:
 - A. Place clean mattress pad on bed by folding it lengthwise with centre crease in middle of bed. Fanfold top layer over mattress. (If pad is reused, simply smooth out any wrinkles.)
 - B. Unfold bottom sheet lengthwise so that centre crease is situated lengthwise along centre of bed. Fanfold sheet's top layer toward centre of bed alongside the patient. Smooth bottom layer of sheet over mattress, and bring the edge over closest side of the mattress. Pull fitted sheet smoothly over mattress ends. Allow edge of flat unfitted sheet to hang about 25 cm over mattress edge. Lower hem of bottom flat sheet should lie seam down and even with bottom edge of mattress (see Step 16B illustration).
- Reduces the transmission of microorganisms.
 - Folding method facilitates replacement and minimizes wrinkles.
 - Bath blanket provides warmth and keeps body parts covered during linen removal.
 - If mattress slides toward foot of the bed when head of the bed is raised, it is difficult to tuck in linen. In addition, it is uncomfortable for the patient because the patient's feet may be pressed against or hang over the foot of the bed.
 - Turning patient onto side provides space for placement of clean linen. Side rail ensures patient's safety from forward falls from the bed surface and helps patient in moving.
 - Prepares for removal of all bottom linen simultaneously. Provides maximum workspace for placing clean linen. Later, when patient turns to other side, soiled linen can be removed easily.
 - Reduces the transmission of microorganisms.
 - Putting on linen over bed in successive layers minimizes energy and time used in bed making.
 - Proper positioning of linen on one side ensures that adequate linen will be available to cover opposite side of bed. Keeping seam edges down eliminates irritation to patient's skin.



Step 14 Old linen tucked under patient.



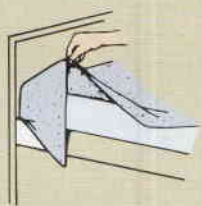
Step 16B Clean linen applied to bed.

Continued

► SKILL 37-5 Making an Occupied Bed—cont'd

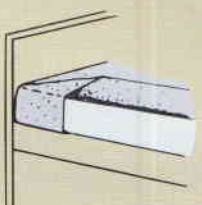
17. Mitre bottom flat sheet at head of bed:

- A. Face head of bed diagonally. Place hand away from head of bed under top corner of mattress, near mattress edge, and lift.
- B. With other hand, tuck top edge of bottom sheet smoothly under mattress so that side edges of sheet above and below the mattress would meet if brought together.
- C. Face side of the bed and pick up top edge of sheet at approximately 45 cm from top of mattress (see Step 17C illustration).
- D. Lift sheet, and lay it on top of mattress to form a neat triangular fold, with lower base of the triangle even with the mattress side edge (see Step 17D illustration).

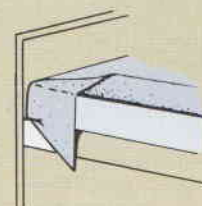


Step 17C Pick up top edge of sheet.

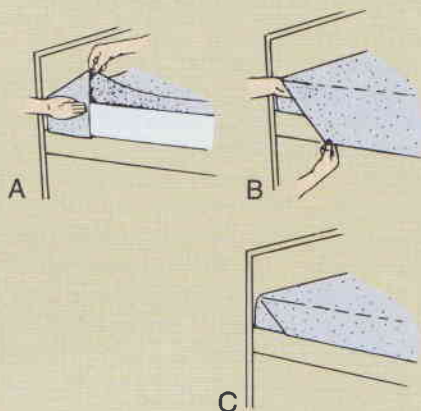
- E. Tuck lower edge of sheet, which is hanging free below the mattress, under the mattress. Tuck with palms down, without pulling triangular fold (see Step 17E illustration).
- F. Hold portion of sheet covering side of mattress in place with one hand. With the other hand, pick up top of triangular linen fold and bring it down over side of the mattress (see Step 17F illustrations). Tuck this portion under mattress (see Step 17F illustrations).



Step 17E Lower edge of sheet tucked under mattress.



Step 17D Sheet on top of mattress in a triangular fold.



Step 17F A and B, Triangular fold placed over side of mattress. C, Linen tucked under mattress.

18. Tuck remaining portion of sheet under the mattress, moving toward foot of the bed. Keep linen smooth.
19. (Optional) Open drawsheet so that it unfolds in half. Lay centrefold along middle of bed lengthwise, and position sheet so that it will be under the patient's buttocks and torso (see Step 19 illustration). Fanfold top layer toward patient, with edge along the patient's back. Smooth bottom layer out over the mattress, and tuck excess edge under mattress (keep palms down).
20. Place waterproof pad over drawsheet, with centrefold against patient's side. Fanfold top layer toward patient.
21. Have patient roll slowly toward you, over the layers of linen. Raise side rail on working side, and go to other side of the bed.

- Mitred corner cannot be loosened easily even if patient moves frequently in bed.

- Folds of linen are source of irritation.
- Drawsheet is used to lift and reposition the patient. Placement under patient's torso distributes most of the patient's body weight over the sheet.
- Protects bed linen from being soiled.
- Positions patient for removal and placement of linens. Maintains patient's safety and body alignment during turning.

► SKILL 37-5 Making an Occupied Bed—cont'd

22. Lower side rail. Assist patient in positioning on other side, over folds of linen (see Step 22 illustration). Loosen edges of soiled linen from under mattress.



Step 19 Optional drawsheet.

23. Remove soiled linen by folding it into a bundle or square, with soiled side turned in. Discard in linen bag. If necessary, wipe mattress with antiseptic solution, and dry mattress surface before putting on new linen.
24. Pull clean, fanfolded linen smoothly over edge of mattress from head to foot of bed.
25. Assist patient in rolling back into supine position. Reposition pillow.
26. Pull fitted sheet smoothly over mattress ends. Mitre top corner of bottom sheet (see Step 17). When tucking corner, be sure that sheet is smooth and free of wrinkles.
27. Facing side of the bed, grasp remaining edge of bottom flat sheet. Lean back; keeping back straight, pull while tucking excess linen under mattress. Proceed from head to foot of the bed. (Avoid lifting mattress during tucking to ensure fit.)
28. Smooth fanfolded drawsheet out over bottom sheet. Grasp edge of the sheet with palms down, lean back, and tuck sheet under mattress. Tuck from middle to top and then to bottom.
29. Place top sheet over patient with centrefold lengthwise down middle of bed. Open sheet from head to foot, and unfold over patient.
30. Ask patient to hold clean top sheet, or tuck sheet around patient's shoulders. Remove the bath blanket and discard in linen bag.
31. Place blanket on bed, unfolding it so that crease runs lengthwise along middle of bed. Unfold blanket to cover patient. Top edge should be parallel with edge of top sheet and 15–20 cm from top sheet's edge.
32. Place bedspread over bed according to Step 31. Be sure that top edge of bedspread extends about 2.5 cm above blanket's edge. Tuck top edge of bedspread over and under top edge of blanket.
33. Make cuff by turning edge of top sheet down over top edge of the blanket and bedspread.

- Exposes opposite side of bed for removal of soiled linen and placement of clean linen. Makes linen easier to remove.



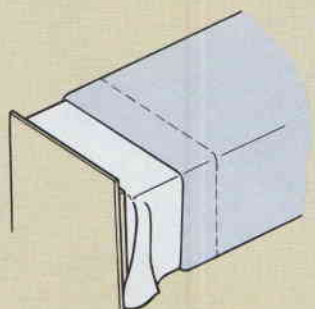
Step 22 Assist patient to roll over folds of linen.

- Reduces the transmission of microorganisms.
- Smooth linen will not irritate patient's skin.
- Maintains patient's comfort.
- Wrinkles and folds can cause irritation to the skin.
- Proper use of body mechanics while tucking linen prevents injury.
- Tucking first at top or bottom may pull sheet sideways, causing poor fit.
- Sheet should be equally distributed over bed by correctly positioning centrefold.
- Sheet prevents exposure of body parts. Having patient hold sheet encourages patient participation in care.
- Blanket should be placed to cover patient completely and provide adequate warmth.
- Gives bed neat appearance and provides extra warmth.
- Protect patient's face from rubbing against blanket or bedspread.

Continued

► SKILL 37-5 Making an Occupied Bed—cont'd

34. Standing on one side at foot of the bed, lift mattress corner slightly with one hand and tuck linens under mattress. Tuck top sheet and blanket under together. Be sure that linens are loose enough to allow movement of patient's feet. Making a horizontal toe pleat is an option (see Step 34 illustration).



Step 34 Optional toe pleat.

35. Make modified mitred corner with top sheet, blanket, and bedspread (see Box 37-16, Step 20 illustration):
- Pick up side edge of top sheet, blanket, and bedspread approximately 45 cm from foot of the mattress. Lift linen to form triangular fold, and lay it on bed.
 - Tuck lower edge of sheet, which is hanging free below mattress, under the mattress. Do not pull triangular fold.
 - Pick up triangular fold, and bring it down over mattress while holding linen in place along side of the mattress. Do not tuck tip of triangle.
36. Raise side rail. Make other side of bed; spread sheet, blanket, and bedspread out evenly. Fold top edge of bedspread over the blanket and make cuff with top sheet (see Step 33); make modified mitred corner at foot of bed (see Step 35).
37. Change pillowcase:
- Have patient raise his or her head. While supporting patient's neck with one hand, remove pillow. Allow patient to lower head.
 - Remove soiled case by grasping pillow at open end with one hand and pulling case back over pillow with the other hand. Discard case in linen bag.
 - Grasp clean pillowcase at centre of closed end. Gather case, turning it inside out over the hand holding it. With the same hand, pick up the middle of one end of the pillow. Pull pillowcase down over pillow with the other hand.
 - Be sure pillow corners fit evenly into corners of the pillowcase. Place pillow under the patient's head.
38. Place call bell within the patient's reach, and return the bed to comfortable position.
39. Open room curtains, and rearrange furniture. Place personal items within easy reach on overbed table or bedside stand. Return bed to a comfortable height.
40. Discard dirty linen in a hamper or chute, remove your gloves, and perform hand hygiene.
41. Ask whether patient feels comfortable.
42. While you are performing this skill, inspect the skin for areas of irritation.
43. Observe the patient for signs of fatigue, dyspnea, pain, or discomfort throughout the skill.
- Makes neat-appearing bed. Pressure ulcers can develop on patient's toes and heels from feet rubbing against tight-fitting bed sheets.
 - Ensures top covers will not loosen easily.
 - Secures top linen but keeps even edge of blanket and top sheet draped over mattress.
 - Side rail protects patient from accidental falls.
 - Support of neck muscles prevents injury during flexion and extension of neck.
 - Pillows slide out easily, thus minimizing contact with soiled linen.
 - Eases sliding of pillowcase over pillow.
 - Poorly fitting case constricts fluffing and expansion of the pillow and interferes with patient comfort.
 - Ensures patient safety and comfort.
 - Promotes sense of well-being.
 - Prevents the transmission of microorganisms.
 - Ensures bed linens are clean and smooth.
 - Folds in linen can cause pressure on the skin.
 - Provides data about patient's level of activity tolerance and ability to participate in other procedures.

► SKILL 37-5 Making an Occupied Bed—cont'd

Unexpected Outcomes

Discomfort caused by linen fold

Signs of breakdown of patient's skin

Recording and Reporting

- Making an occupied bed need not be recorded.

Related Interventions

- Tighten sheets.
- Change patient's position frequently.
- Institute skin care measures to reduce risk of pressure ulcer (see Chapter 46).
- Change patient's position frequently.

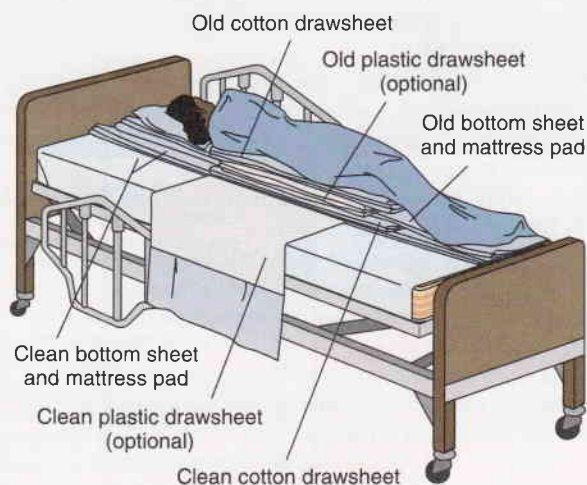


Figure 37-15 Equipment for making an occupied bed.



Figure 37-16 Surgical or recovery bed.

When possible, a bed should be made while it is unoccupied (Box 37-16). Clinical judgement is used regarding the best time to have the patient sit up in a chair while the bed is made. When making an unoccupied bed, follow the basic principles for making an occupied bed.

An unoccupied bed can be open or closed. In an open bed, the top covers are folded back so that a patient can easily get into bed. In a closed bed, the top sheet, blanket, and bedspread are drawn up to the head of the mattress and under the pillows. A closed bed is prepared in a hospital room before a new patient is admitted to that room.

A surgical, recovery, or postoperative bed is a modified version of the open bed. The top bed linen is arranged for easy transfer of the patient from a stretcher to the bed. The top sheets and bedspread are not tucked or mitred at the corners. Instead, the top sheets are folded to one side or to the bottom third of the bed (Figure 37-16). This makes it easier to transfer the patient into the bed.

Linens. In any health care agency, it is important to have an adequate supply of linen to care appropriately for patients. Many agencies have “nurse servers,” either within or just outside a patient’s room, where a daily supply of linen is stored. Because of the emphasis on cost control in health care, it is important to not bring excess linen into a patient’s room. Linen brought into a patient’s room, if unused, must be discarded for laundering, which can increase an agency’s costs. Excess linen lying around a patient’s room creates clutter and obstacles for patient care activities.

Before bed making, it is important to collect necessary bed linen and the patient’s personal items. In this way, you have all equipment accessible to prepare the bed and room. Linens are pressed and folded to prevent the spread of microorganisms and to make bed making easier. When fitted sheets are not available, flat sheets usually are pressed with a centre crease to be placed down the centre of the bed. The linen unfolds easily to the sides, with creases often fitting over the mattress edge. A complete linen change is not always necessary. The sheet, blanket, and bedspread may be reused for the same patient if they are not wet or soiled.

Disposal of linen must be done to minimize the spread of infection (see Chapter 32). Agency policies provide guidelines for the proper way to bag and dispose of soiled linen. After a patient is discharged, all bed linen is sent to the laundry, the mattress and bed are cleaned by housekeeping staff, and new bed linen is applied.

❖ Evaluation

Patient Care

Evaluation of hygiene measures occurs both during and after each particular skill. For example, while bathing a patient, closely inspect the skin to determine whether drainage or other soiling has been effectively removed from the skin’s surface. Once the bath is completed, ask the patient whether his or her comfort and relaxation have improved. When evaluating for the effectiveness of hygiene measures, observe for changes in

► BOX 37-16 Procedural Guideline

Making an Unoccupied Bed

Delegation Considerations:

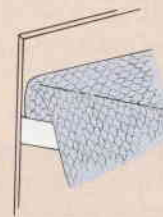
The skill of making an unoccupied bed can be delegated to an unregulated care provider (UCP).

Equipment:

- Linen bag
- Bottom sheet (flat or fitted)
- Drawsheet (optional)
- Top sheet
- Blanket
- Bedspread
- Waterproof pads or soaker pad (optional)
- Pillowcases
- Bedside chair or table
- Disposable gloves (if linen is soiled)
- Washcloth
- Antiseptic cleanser

Procedure:

1. Determine whether patient has been incontinent or excess drainage is on linen. Gloves will be necessary.
2. Assess activity orders or restrictions in mobility to plan whether patient can get out of bed for the procedure. If so, assist patient to bedside chair or recliner.
3. Raise bed to a comfortable working position. Lower the side rails on both sides of the bed.
4. Remove soiled linen and place in linen bag. Avoid shaking or fanning linen.
5. Reposition mattress and wipe off any moisture using a washcloth moistened in antiseptic solution. Dry thoroughly.
6. Put on all bottom linen on one side of bed before moving to opposite side.
7. Be sure fitted sheet is placed smoothly over mattress. To put on a flat unfitted sheet, allow about 25 cm to hang over mattress edge. Lower hem of the sheet should lie seam down, even with bottom edge of the mattress. Pull remaining top portion of sheet over top edge of the mattress.
8. While standing at head of the bed, mitre top corner of bottom sheet (see Skill 37-5, Step 17).
9. Tuck remaining portion of unfitted sheet under the mattress.
10. *Optional and agency or facility specific:* Put on a drawsheet, laying centre fold along middle of the bed lengthwise. Smooth drawsheet over the mattress and tuck excess edge under mattress, keeping palms down.
11. Move to opposite side of the bed, and spread bottom sheet smoothly over edge of mattress from head to foot of the bed.
12. Put on fitted sheet smoothly over each mattress corner. For an unfitted sheet, mitre the top corner of bottom sheet (see Skill 37-5, Step 17), making sure corner is taut.
13. Grasp remaining edge of unfitted bottom sheet and tuck tightly under the mattress while moving from head to foot of the bed. Smooth folded drawsheet over the bottom sheet and tuck under mattress, first at middle, then at top, and then at bottom.
14. If needed, put on a waterproof pad or soaker pad over bottom sheet.
15. Place top sheet over bed with vertical centre fold lengthwise down middle of the bed. Open sheet out from head to foot, being sure top edge of the sheet is even with top edge of the mattress.
16. Make horizontal toe pleat: Stand at foot of bed and fanfold in sheet 5–10 cm across bed. Pull sheet up from bottom to make fold approximately 15 cm from bottom edge of the mattress (see Skill 37-5, Step 34).
17. Tuck in remaining portion of the sheet under foot of mattress. Place blanket over the bed with top edge parallel to top edge of sheet and 15–20 cm down from edge of sheet. (*Optional:* Put on additional bedspread over bed.)
18. Make cuff by turning edge of top sheet down over top edge of the blanket and bedspread.
19. Standing on one side at foot of the bed, lift mattress corner slightly with one hand, and with the other hand tuck top sheet, blanket, and bedspread under the mattress. Be sure toe pleats are not pulled out.
20. Make modified mitred corner with top sheet, blanket, and bedspread. After triangular fold is made, do not tuck tip of triangle (see Step 20 illustration).
21. Go to other side of the bed. Spread sheet, blanket, and bedspread out evenly. Make cuff with top sheet and blanket. Make modified corner at foot of the bed.
22. Put on clean pillowcase.
23. Place call light within patient's reach on a bed rail or pillow and return bed to height allowing for patient transfer. Assist the patient to get into bed.
24. Arrange patient's room. Remove and discard supplies. Perform hand hygiene.



Step 20 Modified mitred corner.

the patient's behaviour. Does the patient assume a more relaxed position? Is the patient free of body odour? Is the patient able to fall asleep? Does the patient's facial expression convey a sense of comfort?

Frequently, it takes time for hygiene care to result in an improvement in a patient's condition. The presence of oral lesions, a scalp infestation, or skin excoriation often requires repeated measures and a combination of nursing interventions. Evaluate for improvement in the patient's

condition over time and determine whether existing therapies are effective.

Throughout evaluation, consider the goals of care and evaluate whether expected outcomes are achieved. A critical thinking approach ensures that consideration is given to all factors when evaluating a patient's care (Figure 37-17). Knowledge base and experience provide important perspectives when analyzing observations made about a patient. For example, once you have seen how dehydration of the oral mucosa clears

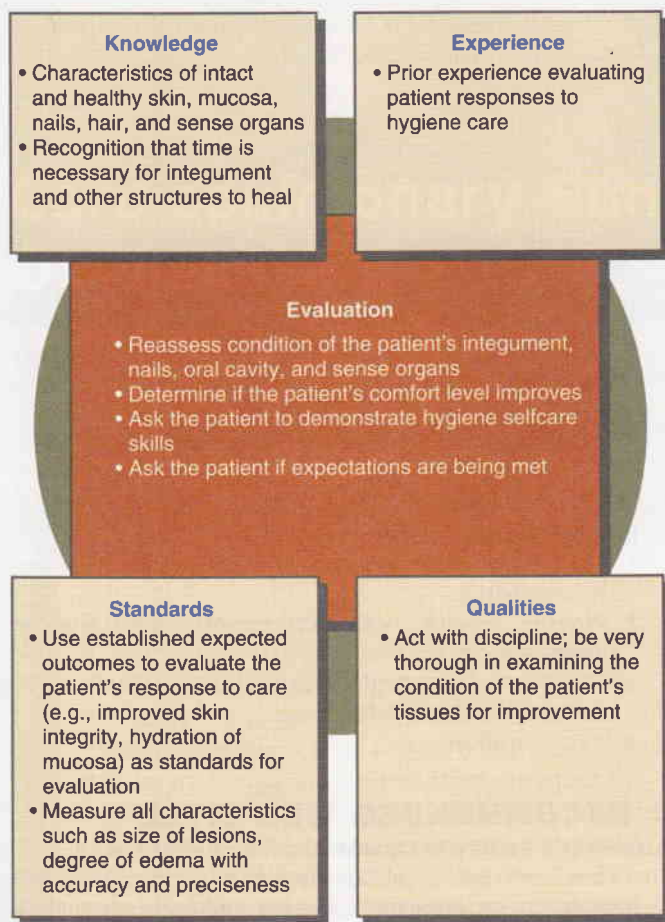


Figure 37-17 Critical thinking model for hygiene evaluation.

with repeated hygiene, it helps you to recognize when progress in another patient is slow. The standards for evaluation are the expected outcomes established in the planning stage of the patient's care. If outcomes are not met, the care plan may need to be revised. Continual application of critical thinking and clinical judgement is necessary when considering all evaluation findings.

Patient Expectations

The final portion of the evaluation considers whether a patient's expectations have been met through hygiene care. You might ask the patient, "Do you feel your bath and back rub helped to make you comfortable?" "Can you suggest ways in which we can improve your foot care?" "What further measures do you think are necessary to keep your mouth clean and refreshed?"

Patients' expectations are important guidelines in determining patient satisfaction. As the care provider, you must feel comfortable in addressing your patients' concerns and expectations. A caring approach can facilitate a discussion of these issues.

✦ KEY CONCEPTS

- Determine a patient's ability to perform self-care and provide hygiene care according to the patient's needs and preferences.
- During hygiene, integrate other activities such as physical assessment, wound care, and ROM exercises.

- While providing daily hygiene needs, use teaching and communication skills in developing a caring relationship with the patient.
- Various personal, sociocultural, socioeconomic, and developmental factors influence patients' hygiene practices.
- Patients' health beliefs predict the likelihood of their assuming health-promoting behaviour, such as the maintenance of good hygiene.
- You might not assess all body regions before administering hygiene; however, routine assessment of the patient's condition is undertaken whenever care is given.
- Patients with reduced sensation, vascular insufficiency, and immobility are at greater risk for impaired skin integrity.
- You must perform an assessment of each patient's physical and cognitive abilities to perform basic hygiene measures, including muscle strength, flexibility and dexterity, balance, coordination, activity tolerance, and ability to comprehend. For patients suffering symptoms such as pain or nausea, administering symptom relief therapies before performing hygiene procedures better prepares the patient.
- Patients with diabetes mellitus require special nail and foot care.
- When administering oral care to unconscious patients, measures must be taken to prevent aspiration.
- A patient's room should be comfortable, safe, and uncluttered to provide for patient comfort and safety.
- An evaluation of hygiene care is based on the patient's sense of comfort, relaxation, well-being, and understanding of hygiene techniques.

✦ CRITICAL THINKING EXERCISES

1. Jack Hines, a 19-year-old, remains in hospital after a motorcycle accident in which he suffered multiple traumatic injuries. Jack has limited mobility due to casts to his left leg and arm. Discuss important factors to consider when administering hygiene care. Identify two nursing diagnoses and interventions with rationales.
2. Marian Goyeau, a 40-year-old woman, was admitted into hospital for treatment of a malignant breast lesion. Marian is undergoing chemotherapy along with radiation treatment. During your assessment, she complains of a loss of appetite, nausea and vomiting, and sores in her mouth. Marian is suffering from stomatitis. Identify two nursing diagnoses and interventions with rationales.
3. Michelle Tweed, a 78-year-old woman, was transferred from an acute care hospital to a rehabilitation facility after a cerebrovascular accident. She exhibits right hemiparesis and aphasia and is incontinent of urine and stool. During the initial assessment, you discover that Mrs. Tweed has reddened areas on both heels, and her perineum and buttocks are excoriated. Identify two priority nursing diagnoses. Discuss at least three factors that contributed to Mrs. Tweed's impaired skin integrity.

✦ REVIEW QUESTIONS

1. Mr. Mazzuca presents with an ulcer on his left foot. His diabetes mellitus is considered when planning care for him. In providing teaching on foot care, which of the following is most important to include?
 1. Daily inspection of his feet
 2. Application of lotion to his feet and between his toes daily
 3. Daily soaking of his feet in hot water
 4. Cutting his toenails in the shape of a curve

2. A 35-year-old man is interested in obtaining information about the cause of his psoriasis. Which of the following should be included in the patient teaching?
 1. Psoriasis is contagious.
 2. Psoriasis can be related to poor hygiene.
 3. Psoriasis is not contagious.
 4. Psoriasis can be cured.
3. A 75-year-old woman who has a history of diabetes and peripheral vascular disease has been trying to remove a corn from the bottom of her foot with a pair of scissors. Patient teaching should include which of the following?
 1. Increased circulation in her feet could cause severe bleeding if she were to injure her foot with the scissors.
 2. Peripheral vascular disease increases her risk of developing more corns.
 3. Diabetes mellitus places her at an increased risk for infection if she has an open wound on her foot.
 4. Her chronic disease limits her range of motion, and she may not be able to safely see or reach the corn on the bottom of her foot.
4. A thorough skin assessment is very important because the skin can provide information about which of the following?
 1. Support systems
 2. Circulatory status
 3. Psychological wellness
 4. Fundamental skills
5. A dark-skinned patient is in the intensive care unit after a motor vehicle collision. In assessing for cyanosis, you would expect to find which characteristics in this patient's skin?
 1. Ruddy colour
 2. Generalized pallor
 3. Ashen, grey, or dull appearance
 4. Patchy areas of pallor
6. When assessing for inflammation in a darkly pigmented patient, you would do which of the following?
 1. Assess the skin for swelling
 2. Palpate the skin for edema and increased warmth
 3. Assess the oral mucosa for cyanosis
 4. Palpate the skin for tenderness
7. Before providing mouth care to an unconscious patient, which of the following should be considered first?
 1. Presence of a gag reflex
 2. Condition of the skin
 3. Presence of pain
 4. Availability of equipment
8. When providing hair care for a patient, which of the following is not an important consideration?
 1. Caregiver preferences
 2. Family preferences
 3. Cultural preferences
 4. Patient preferences
9. Which of the following is the correct technique when providing eye care?
 1. Eyes should be cleansed from the outer to the inner canthus.
 2. Eyes should be cleansed from the inner to the outer canthus.
 3. Eye hygiene is not necessary.
 4. It is acceptable to cleanse eyes from either direction.
10. Which of the following is important to consider when providing hygiene care for patients?
 1. Use communication skills that promote a caring therapeutic relationship.
 2. Provide privacy, convey respect, and promote independence.
 3. Provide an environment that promotes the patient's physical and mental comfort.
 4. All of the above.

✦ RECOMMENDED WEB SITES

Alzheimer's Society of Canada: <http://www.alzheimer.ca>

The Alzheimer's Society of Canada Web site offers important information on Alzheimer's disease and other dementias, treatment, research, support, and services.

Canadian Dental Association: <http://www.cda-adc.ca>

The Canadian Dental Association Web site offers information on maintaining optimal oral health, including oral hygiene for older adults.

Canadian Diabetes Association: <http://www.diabetes.ca>

The Canadian Diabetes Association Web site offers information on the different types of diabetes, treatment, research, and services.

Public Health Agency of Canada: <http://www.publichealth.gc.ca>

This Web site is a valuable resource offering information on healthy living, disease, and injury prevention.

Review Question Answers

1. 1, 2, 3, 3, 3, 4, 2, 5, 3, 6, 2, 7, 1, 8, 1, 9, 2, 10, 4

Rationales for the Review Questions appear at the end of the book.

Cardiopulmonary Functioning and Oxygenation

Original chapter by Paulette M. Archer, RN, EdD

Canadian content written by Giuliana Harvey, RN, MN

objectives

Mastery of content in this chapter will enable you to:

- Define the key terms listed.
- Describe the structure and function of the cardiopulmonary system.
- Identify the physiological processes of cardiac output, myocardial blood flow, and coronary artery circulation.
- Diagram the electrical conduction system of the heart.
- Describe the relationship among cardiac output, preload, afterload, contractility, and heart rate.
- Identify the physiological processes involved in ventilation, perfusion, and exchange of respiratory gases.
- Describe the neural and chemical regulation of respiration.
- Describe the impact of a patient's level of health and age, lifestyle, and environment on tissue oxygenation.
- Identify and describe clinical outcomes as a result of disturbances in conduction, altered cardiac output, impaired valvular function, myocardial ischemia, and impaired tissue perfusion.
- Identify and describe clinical outcomes of hyperventilation, hypoventilation, and hypoxemia.
- Identify nursing care interventions in the primary care, acute care, and restorative and continuing care settings that promote oxygenation.

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- Examination Review Questions
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- Skills Performance Checklists
- Student Learning Activities
- Video Clips
- Weblinks

media resources

key terms

- Afterload, p. 879
- Anemia, p. 882
- Angina pectoris, p. 886
- Asystole, p. 884
- Atelectasis, p. 887
- Atrial fibrillation, p. 884
- Bronchoscopy, p. 891
- Cardiac index (CI), p. 891
- Cardiac output, p. 879
- Cardiopulmonary rehabilitation, p. 932
- Cardiopulmonary resuscitation (CPR), p. 929
- Chest physiotherapy (CPT), p. 902
- Chest tube, p. 920
- Cor pulmonale, p. 881
- Cyanosis, p. 887
- Diaphragmatic breathing, p. 933
- Diffusion, p. 881
- Dyspnea, p. 890
- Dysrhythmias, p. 884
- Electrocardiogram (ECG), p. 880
- Expiration, p. 881
- Hematemesis, p. 891
- Hemoptysis, p. 891
- Hemothorax, p. 920
- High-flow devices, p. 925
- Humidification, p. 901
- Hyperventilation, p. 887
- Hypercapnia, p. 883
- Hypoventilation, p. 887
- Hypovolemia, p. 883
- Hypoxia, p. 887
- Incentive spirometry, p. 920
- Inspiration, p. 881
- Low-flow devices, p. 925
- Mediastinal chest tube, p. 923
- Myocardial contractility, p. 879
- Myocardial infarction (MI), p. 886
- Myocardial ischemia, p. 886
- Nasal cannula, p. 925
- Nebulization, p. 901
- Normal sinus rhythm (NSR), p. 880
- Orthopnea, p. 890
- Pneumothorax, p. 920
- Postural drainage, p. 902
- Preload, p. 879
- Pulse oximeter, p. 896
- Pursed-lip breathing, p. 933
- Subcutaneous emphysema, p. 921
- Stroke volume, p. 879
- Ventilation, p. 880
- Ventricular fibrillation, p. 884
- Ventricular tachycardia, p. 884
- Wheezing, p. 891

Oxygen is required to sustain life. The cardiac and respiratory systems function to supply the body's oxygen demands. Blood is oxygenated through the mechanisms of ventilation, perfusion, and transport of respiratory gases. Neural and chemical regulators

control the rate and depth of respiration in response to tissue's changing oxygen demands.

Scientific Knowledge Base

Cardiovascular Physiology

Cardiopulmonary physiology involves delivery of (a) deoxygenated blood (blood high in carbon dioxide and low in oxygen) to the right side of the heart and to the pulmonary circulation and (b) oxygenated blood from the lungs to the left side of the heart and the tissues. The cardiac system delivers oxygen, nutrients, and other substances to the tissues and removes the waste products of cellular metabolism through the cardiac pump, the circulatory vascular system, and the integration of other systems (e.g., respiratory, digestive, and renal) (McCance & Huether, 2005).

Structure and Function. The right ventricle pumps blood through the pulmonary circulation. The left ventricle pumps blood to the systemic circulation (Figure 38-1). The circulatory system exchanges respiratory gases, nutrients, and waste products between the blood and the tissues.

Myocardial Pump. The pumping action of the heart is essential to maintaining oxygen delivery. Coronary artery disease and cardiomyopathic (enlarged heart) conditions result in a diminished stroke volume (i.e., the volume of blood ejected from the ventricles) and decreased pump effectiveness. Hemorrhage and dehydration decrease pump effectiveness by decreasing the amount of blood ejected from the ventricles, thereby reducing circulating blood volume. The four chambers of the heart fill with blood during diastole and empty during systole.

The myocardial (cardiac muscle) fibres have contractile properties that enable them to stretch during filling. In a healthy heart, this stretch is proportionally related to the strength of contraction. As the myocardium stretches, the strength of the subsequent contraction increases; this is known

as the Frank-Starling (Starling's) law of the heart. In the diseased heart, Starling's law does not apply because the stretch of the myocardium is beyond the heart's physiological limits. The subsequent contractile response results in insufficient ventricular ejection (volume), and blood begins to "back up" in the pulmonary (left heart failure) or systemic circulation (right heart failure).

Myocardial Blood Flow. To maintain adequate blood flow to the pulmonary and systemic circulation, myocardial blood flow must supply sufficient oxygen and nutrients to the myocardium itself. Blood flow through the heart is unidirectional. There are four heart valves that ensure this forward blood flow (see Figure 38-1). During ventricular diastole, the atrioventricular (mitral and tricuspid) valves open and blood flows from the higher-pressure atria into the relaxed ventricles. This represents S_1 , or the first heart sound. After ventricular filling, the systolic phase begins.

During the systolic phase, semilunar (aortic and pulmonic) valves open and blood flows from the ventricles into the aorta and pulmonary artery. Closure of aortic and pulmonic valves represents S_2 , or the second heart sound. Patients with valvular disease may have backflow or regurgitation of blood through the incompetent valve, causing a murmur that is heard on auscultation (see Chapter 31).

Coronary Artery Circulation. Blood in the atria and ventricles does not supply oxygen and nutrients to the myocardium itself. The coronary circulation is the branch of the systemic circulation that supplies the myocardium with oxygen and nutrients and removes waste. The coronary arteries fill during ventricular diastole (McCance & Huether, 2005). The right and left coronary arteries arise from the aorta just above and behind the aortic valve through openings called the coronary ostia (coronary openings). The left coronary artery, the most abundant blood supply, feeds the left ventricular myocardium, which is more muscular and does most of the heart's work (Box 38-1).

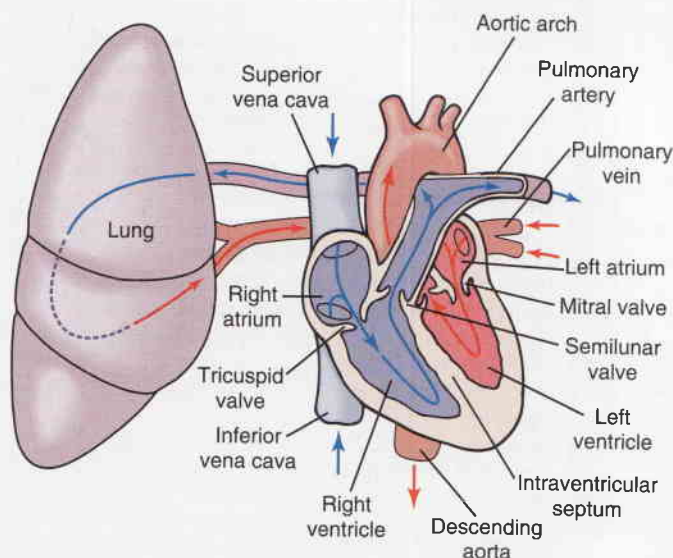


Figure 38-1 Schematic representation of blood flow through the heart. Arrows indicate direction of flow. **Source:** Lewis, S. L., Heitkemper, M. M., Dirksen, S. R., O'Brien, P. G., & Bucher, L. (2010). *Medical-surgical nursing in Canada: Assessment and management of clinical problems* (2nd Canadian ed., p. 802, Fig. 33-2). Toronto: Elsevier Canada.

BOX 38-1 Coronary Arteries

Right Coronary Artery

Right Atrium, Anterior Right Ventricle

Supplies

- Posterior aspect of septum (90% of population)
- Posterior papillary muscle
- Sinus and atrioventricular nodes (80%–90% of population)
- Inferior aspect of left ventricle

Left Coronary Arteries

Left Anterior Descending Artery

Supplies

- Anterior left ventricular wall
- Anterior interventricular septum (septal branches supply conduction system, bundle of His, and bundle branches)
- Anterior papillary muscle
- Left ventricular apex
- Right ventricle

Circumflex Artery

Supplies

- Left atrium
- Posterior surfaces of left ventricle
- Posterior aspects of septum

Systemic Circulation. The arteries and veins of the systemic circulation deliver nutrients and oxygen to and remove waste from the tissues. Oxygenated blood flows from the left ventricle by way of the aorta and into large systemic arteries. These arteries branch into smaller arteries, into arterioles, and finally into the smallest vessels, the capillaries. At the capillary level, the exchange of respiratory gases, nutrients, and wastes occurs, and the tissues are oxygenated. The waste products exit the capillary network by way of the venules that join to form veins. These veins form larger veins, which carry deoxygenated blood to the right side of the heart, where it is returned to pulmonary circulation.

Blood Flow Regulation. The amount of blood ejected from the left ventricle each minute is the **cardiac output**. The normal cardiac output is 4 to 6 L/minute in the healthy 68 kg adult at rest. The circulating volume of blood changes according to the oxygen and metabolic needs of the body. For example, during exercise, pregnancy, and fever, the cardiac output increases, but during sleep it decreases. Cardiac output is represented by the following formula:

$$\text{Cardiac output (CO)} = \text{Stroke volume (SV)} \times \text{Heart rate (HR)}$$

Cardiac output in the older adult may be affected by increased arterial wall tension and moderate myocardial hypertrophy due to an increased systolic blood pressure.

Cardiac index (CI) is the adequacy of the cardiac output for an individual. It takes into account the body surface area (BSA) of the patient. The CI is determined by dividing the cardiac output by the BSA. The normal range is 2.5 to 4 L/minute/m². Both cardiac output and the CI are measured with invasive pulmonary artery catheters.

Stroke volume is the amount of blood ejected from the left ventricle with each contraction. It can be affected by the amount of blood in the left ventricle at the end of diastole (preload), the resistance to left ventricular ejection (afterload), and myocardial contractility.

Preload is essentially the end-diastolic volume. The ventricles stretch when filling with blood. The more stretch on the ventricular muscle, the greater the contraction and the greater the stroke volume (Starling's law). In clinical situations, the preload and subsequent stroke volume can be manipulated by changing the amount of circulating blood volume. For example, in the patient with hemorrhagic shock, fluid therapy and replacement of blood increases volume, thus increasing the preload and cardiac output. If volume is not replaced, preload decreases, the cardiac output decreases, and, ultimately, the venous return to the right atrium decreases, further decreasing preload and cardiac output.

Afterload is the resistance to left ventricular ejection—the work that the heart must overcome to fully eject blood from the left ventricle. The diastolic aortic pressure is a good clinical measure of afterload. In a patient with an acute hypertensive crisis, the afterload is greater than normal, increasing the cardiac workload. Afterload in this situation can be manipulated by decreasing systemic blood pressure.

The measurement and monitoring of these cardiopulmonary hemodynamics is usually performed in critical care units. Some stepdown or special care units may also have the capability to measure and monitor hemodynamics.

Myocardial contractility also affects stroke volume and cardiac output. Poor contraction decreases the amount of blood ejected by the ventricles during each contraction. Drugs

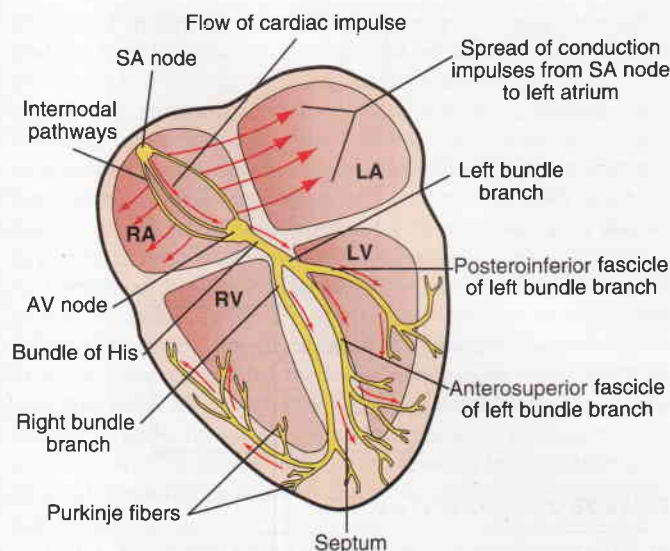


Figure 38-2 Conduction system of the heart. AV, atrioventricular; LA, left atrium; LV, left ventricle; RA, right atrium; RV, right ventricle; SA, sinoatrial. **Source:** Lewis, S. M., Heitkemper, M. M., Dirksen, S. R., O'Brien, P. G., & Bucher, L. (2010). *Medical-surgical nursing in Canada: Assessment and management of clinical problems* (2nd Canadian ed., p. 803). Toronto: Elsevier Canada.

that can increase the force of myocardial contraction include digitalis preparations, epinephrine, and sympathomimetic drugs (drugs that mimic the effects of the sympathetic nervous system). Injury to the myocardial muscle, such as an acute myocardial infarction (AMI), can cause a decrease in myocardial contractility. The myocardium of the older adult is more rigid and slower in recovering its contractility (Meiner & Leuckenotte, 2006).

Heart rate affects blood flow because of the interaction between rate and diastolic filling time. With a sustained heart rate greater than 160 beats per minute, diastolic filling time decreases, decreasing stroke volume and cardiac output. The heart rate of the older adult is slow to increase under stress (Meiner & Leuckenotte, 2006).

Conduction System. The rhythmic relaxation and contraction of the atria and ventricles depend on continuous, organized transmission of electrical impulses. These impulses are generated and transmitted by way of the cardiac conduction system (Figure 38-2).

The heart's conduction system generates the necessary action potentials that conduct the impulses required to initiate the electrical chain of events resulting in the heartbeat. The autonomic nervous system influences the rate of impulse generation, the speed of transmission through the conductive pathway, and the strength of atrial and ventricular contractions. Sympathetic nerve fibres, which increase the rate of impulse generation and the speed of impulse transmission, innervate all parts of the atria and ventricles. The parasympathetic fibres originating from the vagus nerve decrease the rate and innervate all parts of the atria and ventricles, as well as the sinoatrial (SA) and atrioventricular (AV) nodes (McCance & Huether, 2005).

The conduction system originates with the SA node, the "pacemaker" of the heart. The SA node is in the right atrium next to the entrance of the superior vena cava. Impulses are initiated at the SA node at an intrinsic rate of 60 to 100 beats

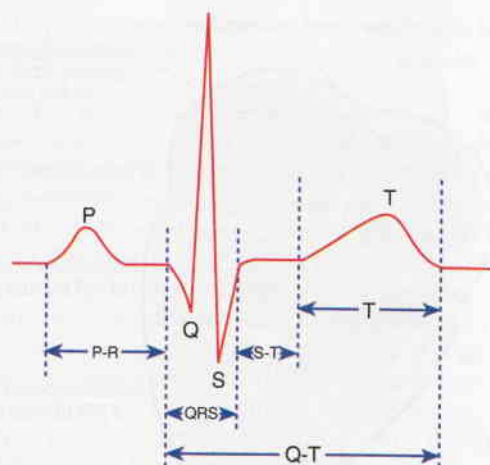


Figure 38-3 Normal ECG waveform.

per minute. The resting adult rate is approximately 75 beats per minute.

The electrical impulses are then transmitted through the atria along intra-atrial pathways to the AV node. The AV node mediates impulses between the atria and the ventricles. The intrinsic rate of the normal AV node is 40 to 60 beats per minute. The AV node assists atrial emptying by delaying the impulse before transmitting it through the bundle of His and the ventricular Purkinje network. The intrinsic rate of the bundle of His and the ventricular Purkinje network is 20 to 40 beats per minute.

An **electrocardiogram (ECG)** reflects the electrical activity of the conduction system. An ECG monitors the regularity and path of the electrical impulse through the conduction system; however, it does not reflect muscular work of the heart. The normal sequence on the ECG is called **normal sinus rhythm (NSR)** (Figure 38-3).

NSR implies that the impulse originates at the SA node and follows the normal sequence through the conduction system. The P wave represents the electrical conduction through both atria. Atrial contraction follows the P wave. The PR interval represents the impulse travel time through the AV node, through the bundle of His, and to the Purkinje fibres. The normal length for the PR interval is 0.12 to 0.20 seconds. An increase in the time (i.e., >0.20 seconds) indicates that there is a block in the impulse transmission through the AV node; a decrease (i.e., <0.12 seconds) indicates the initiation of the electrical impulse from a source other than the SA node.

The QRS complex indicates that the electrical impulse has travelled through the ventricles. Normal QRS duration is 0.06 to 0.12 seconds. An increase in QRS duration indicates a delay in conduction time through the ventricles. Ventricular contraction usually follows the QRS complex.

The QT interval represents the time needed for ventricular depolarization and repolarization. The normal QT interval is 0.12 to 0.42 seconds. Changes in electrolyte values, such as in hypocalcemia or during therapy with drugs such as disopyramide, amiodarone, and theophylline (Theo-Dur), can increase the QT interval. Shortening of the QT interval occurs with digitalis therapy, hyperkalemia, and hypercalcemia.

Respiratory Physiology

Most cells in the body obtain their energy from chemical reactions involving oxygen and the elimination of carbon dioxide.

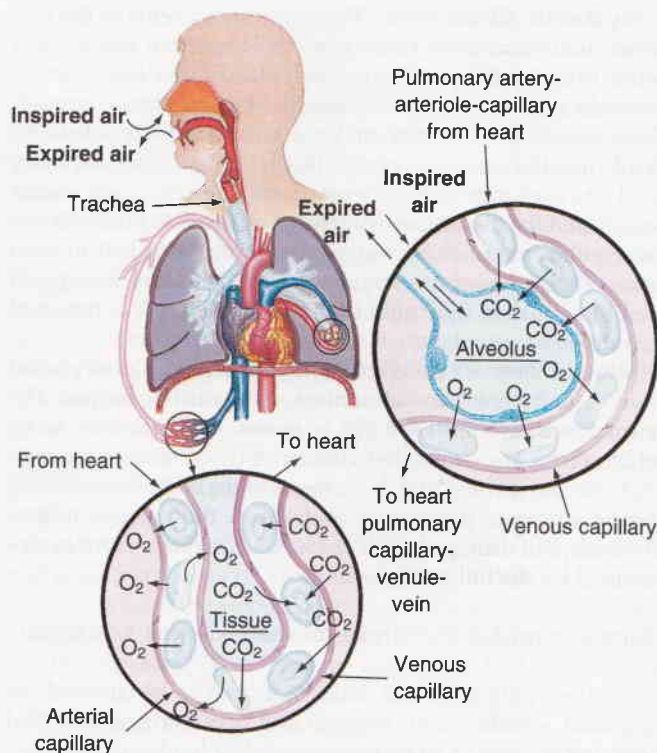


Figure 38-4 Structures of the pulmonary system. The circle denotes the alveoli. **Source:** Thompson, J. M., McFarland, G. K., Hirsch, J. E., Tucker, S. M., & Bowers, A. C. (Eds.). (1993). *Mosby's clinical nursing* (3rd ed.). St Louis, MO: Mosby-Year Book.

The exchange of respiratory gases occurs between environmental air and the blood (Figure 38-4). There are three steps in the process of oxygenation: ventilation, perfusion, and diffusion.

Structure and Function. Conditions or diseases that change the structure and function of the lung can alter respiration. The respiratory muscles, pleural space, lungs, and alveoli (Figure 38-5) are essential for ventilation, perfusion, and exchange of respiratory gases. Gases are moved into and out of the lungs through pressure changes. Intrapleural pressure is either negative or less than atmospheric pressure, which is 760 mm Hg at sea level. For air to flow into the lungs, intrapleural pressure must become more negative, setting up a pressure gradient between the atmosphere and the alveoli. The diaphragm and external intercostal muscles contract to create a negative pleural pressure and increase the size of the thorax for inspiration. Relaxation of the diaphragm and contraction of the internal intercostal muscles allows air from the lung to escape. The coordination of the respiratory muscles is essential for effective respiration and gas exchange. The lung transfers oxygen from the atmosphere into the alveoli, where the oxygen is exchanged for carbon dioxide. The alveoli transfer oxygen and carbon dioxide to and from the blood through the alveolar membrane.

Ventilation is the process of moving gases into and out of the lungs. Ventilation requires coordination of the muscular and elastic properties of the lung and thorax, as well as intact innervation. The major inspiratory muscle of respiration is the diaphragm. It is innervated by the phrenic nerve, which exits the spinal cord at the fourth cervical vertebra. Perfusion relates

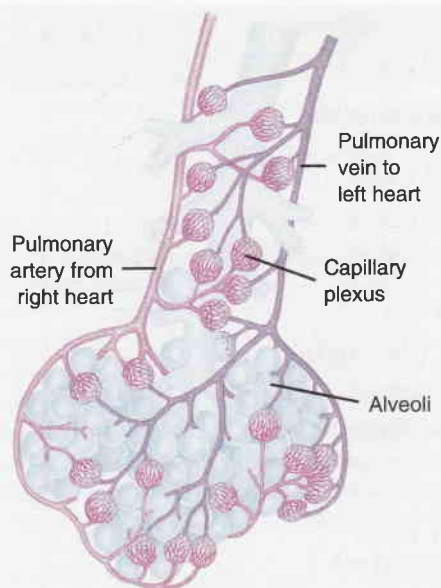


Figure 38-5 Alveoli at the terminal end of the lower airway. **Source:** Thompson, J., M., McFarland, G. K., Hirsch, J. E., Tucker, S. M., & Bowers, A. C. (Eds.). (1993). *Mosby's clinical nursing* (3rd ed.). St Louis, MO: Mosby-Year Book.

to the ability of the cardiovascular system to pump oxygenated blood to the tissues and return deoxygenated blood to the lungs. Diffusion is responsible for moving the molecules from one area to another. For the exchange of respiratory gases to occur, the organs, nerves, and muscles of respiration must be intact and the central nervous system able to regulate the respiratory cycle.

Work of Breathing. Breathing is the effort required for expanding and contracting the lungs. In the healthy individual, breathing is quiet and accomplished with minimal effort. The amount of energy expended on breathing depends on the rate and depth of breathing, the ease with which the lungs can be expanded (compliance), and airway resistance (Jevon & Ewens, 2001).

Inspiration is an active process, stimulated by chemical receptors in the aorta. **Expiration** is a passive process that depends on the elastic-recoil properties of the lungs, requiring little or no muscle work. Elastic recoil is produced by elastic fibres in lung tissue and by surface tension in the fluid film lining the alveoli. Surfactant is a chemical produced in the lungs that maintains the surface tension of the alveoli and keeps them from collapsing. Patients with advanced chronic obstructive pulmonary disease (COPD) lose the elastic recoil of the lungs and thorax. As a result, the patient's work of breathing is increased. In addition, patients with certain pulmonary diseases can have decreased surfactant production and may, in turn, develop atelectasis.

Accessory muscles of respiration can increase lung volume during inspiration. Patients with COPD, especially emphysema, frequently use these muscles to increase lung volume. Prolonged use of the accessory muscles of respiration does not promote effective ventilation and causes fatigue. During assessment, observe elevation of the patient's clavicles during inspiration.

Compliance is the ability of the lungs to distend or expand in response to increased intra-alveolar pressure. Compliance is

decreased in diseases such as pulmonary edema, interstitial and pleural fibrosis, and congenital or traumatic structural abnormalities such as kyphosis or fractured ribs.

Airway resistance is the pressure difference between the mouth and the alveoli in relation to the rate of flow of inspired gas. Airway resistance can be increased by an airway obstruction, small airway disease (such as asthma), and tracheal edema. When resistance is increased, the amount of air traveling through the anatomical airways is decreased.

Decreased lung compliance, increased airway resistance, active expiration, or the use of accessory muscles increases the work of breathing, resulting in increased energy expenditure. To meet this expenditure, the body increases its metabolic rate, and the need for oxygen, as well as for the elimination of carbon dioxide, increases. This sequence is a vicious cycle for a patient with impaired ventilation, causing further deterioration of respiratory status and the ability to oxygenate adequately.

Lung Volumes and Capacities. Spirometry is used to measure the volume of air entering or leaving the lungs. Variations in lung volumes may be associated with health states such as pregnancy, exercise, obesity, or obstructive and restrictive conditions of the lungs. The amount of surfactant, degree of compliance, and strength of respiratory muscles can affect pressures and volumes within the lungs.

Pulmonary Circulation. The primary function of the pulmonary circulation is to move blood to and from the alveolo-capillary membrane in order for gas exchange to occur. The pulmonary circulation serves as a reservoir for blood so that the lung can increase its blood volume without large increases in pulmonary artery or venous pressures. The pulmonary circulation also acts as a filter, removing small thrombi before they can reach vital organs.

The pulmonary circulation begins at the pulmonary artery, which receives poorly oxygenated mixed venous blood from the right ventricle. Blood flow through this system depends on the pumping ability of the right ventricle, which has an output of approximately 4 to 6 L/minute. The flow continues from the pulmonary artery through the pulmonary arterioles to the pulmonary capillaries, where blood comes in contact with the alveolocapillary membrane and the exchange of respiratory gases occurs. The oxygen-rich blood then circulates through the pulmonary venules and pulmonary veins, returning to the left atrium.

Pressure and resistance within the pulmonary circulatory system is lower than that within the systemic circulatory system. The walls of the pulmonary vessels are thinner and contain less smooth muscle. The lung accepts the total cardiac output from the right ventricle and, except in cases of alveolar hypoxia or cor pulmonale, does not direct blood flow from one region to another. **Cor pulmonale** is a condition in which the right ventricle is enlarged, secondary to diseases of the lung, thorax, or pulmonary circulation.

Respiratory Gas Exchange. Respiratory gases are exchanged in the alveoli and the capillaries of the body tissues. Oxygen is transferred from the lungs to the blood, and carbon dioxide is transferred from the blood to the alveoli to be exhaled as a waste product. At the tissue level, oxygen is transferred from the blood to tissues, and carbon dioxide is transferred from tissues to the blood to return to the alveoli and be exhaled. This transfer is dependent on the process of diffusion.

Diffusion is the movement of molecules from an area of higher concentration to an area of lower concentration.

Diffusion of respiratory gases occurs at the alveolocapillary membrane, and the rate of diffusion can be affected by the thickness of the membrane. Increased thickness of the membrane impedes diffusion because gases take longer to transfer across. Patients with pulmonary edema, pulmonary infiltrates, or a pulmonary effusion have an increased thickness of the alveolocapillary membrane, resulting in slowed diffusion, slowed exchange of respiratory gases, and impaired delivery of oxygen to tissues. The surface area of the membrane can be altered as a result of chronic disease (e.g., emphysema), acute disease (e.g., pneumothorax), or surgical process (e.g., lobectomy). The alveolocapillary membrane can be destroyed or may thicken, changing the rate of diffusion. When fewer alveoli are functioning, the surface area is decreased.

Oxygen Transport. The oxygen transport system consists of the lungs and cardiovascular system. Delivery depends on the amount of oxygen entering the lungs (ventilation), blood flow to the lungs and tissues (perfusion), rate of diffusion, and oxygen-carrying capacity. The capacity of the blood to carry oxygen is influenced by the amount of dissolved oxygen in the plasma, amount of hemoglobin, and tendency of hemoglobin to bind with oxygen. Only a relatively small amount of required oxygen, less than 1%, is dissolved in the plasma. Most oxygen is transported by hemoglobin, which serves as a carrier for oxygen and carbon dioxide. The hemoglobin molecule combines with oxygen to form oxyhemoglobin. The formation of oxyhemoglobin is easily reversible, allowing hemoglobin and oxygen to dissociate, which frees oxygen to enter tissues.

Carbon Dioxide Transport. Carbon dioxide diffuses into red blood cells and is rapidly hydrated into carbonic acid (H_2CO_3) because of the presence of carbonic anhydrase. The carbonic acid then dissociates into hydrogen (H^+) and bicarbonate (HCO_3^-) ions. The hydrogen ion is buffered by hemoglobin, and the HCO_3^- diffuses into the plasma (see Chapter 39). In addition, some of the carbon dioxide in red blood cells reacts with amino acid groups, forming carbamino compounds. This reaction can occur rapidly without the presence of an enzyme. Reduced hemoglobin (deoxyhemoglobin) can combine with carbon dioxide more easily than oxyhemoglobin, thus venous blood transports most of the carbon dioxide.

Regulation of Respiration. Regulation of respiration is necessary to ensure sufficient oxygen intake and carbon dioxide elimination to meet the body's demands (e.g., during exercise, infection, or pregnancy). Neural and chemical regulators control the process of respiration. Neural regulation includes the central nervous system control of respiratory rate, depth, and rhythm. Chemical regulation involves the influence of chemicals such as carbon dioxide and hydrogen ions on the rate and depth of respiration (Box 38-2).

Factors Affecting Oxygenation

Adequacy of circulation, ventilation, perfusion, and transport of respiratory gases to the tissues is influenced by four types of factors: (1) physiological, (2) developmental, (3) lifestyle, and (4) environmental. Developmental, lifestyle, and environmental factors will be presented in a later section.

Physiological Factors. Any condition that affects cardiopulmonary functioning directly affects the body's ability to meet oxygen demands. The general classifications of cardiac disorders are disturbances in conduction, impaired valvular function, myocardial hypoxia, cardiomyopathic conditions, and peripheral tissue hypoxia. Respiratory disorders include hyperventilation, hypoventilation, and hypoxia.

► BOX 38-2

Physiological Processes of Oxygenation

Neural Regulation

Maintains rhythm and depth of respiration and balance between inspiration and expiration.

Cerebral Cortex

Voluntary control of respiration delivers impulses to the respiratory motor neurons by way of the spinal cord; accommodates speaking, eating, and swimming.

Medulla Oblongata

Automatic control of respiration occurs continuously.

Chemical Regulation

Maintains appropriate rate and depth of respirations according to changes in the blood's carbon dioxide (CO_2), oxygen (O_2), and hydrogen ion (H^+) concentration.

Chemoreceptors

Located in the medulla, aortic body, and carotid body. Changes in chemical content of O_2 , CO_2 , and H^+ stimulate chemoreceptors, which in turn stimulate neural regulators to adjust the rate and depth of ventilation to maintain normal arterial blood gas levels. Chemical regulation can occur during physical exercise and with some illnesses. It is a short-term adaptive mechanism.

► TABLE 38-1

Physiological Processes Affecting Oxygenation

Process	Effect on Oxygenation
Anemia	Decreases oxygen-carrying capacity of blood
Toxic inhalant	Decreases oxygen-carrying capacity of blood
Airway obstruction	Limits delivery of inspired oxygen to alveoli
High altitude	Atmospheric oxygen concentration is lower and inspiratory oxygen concentration decreases
Fever	Increases metabolic rate and tissue oxygen demand
Decreased chest wall motion (e.g., from musculoskeletal impairments)	Prevents lowering of diaphragm and reduces anteroposterior diameter of thorax on inspiration, reducing volume of air inspired

Other physiological processes affecting a patient's oxygenation are alterations that affect the oxygen-carrying capacity of blood, such as anemia, increases in the body's metabolic demands (e.g., pregnancy, fever, infection), and alterations that affect chest wall movement or the central nervous system (Table 38-1).

Decreased Oxygen-Carrying Capacity. Hemoglobin carries most of the oxygen to tissues. Anemia and inhalation of toxic substances decrease the oxygen-carrying capacity of blood by reducing the amount of available hemoglobin to transport oxygen. **Anemia**, a hemoglobin level lower than normal, is a result of decreased hemoglobin production, increased red blood cell destruction, blood loss, or a combination of these factors. Patients will have complaints of fatigue,

decreased activity tolerance, and increased breathlessness, as well as pallor (especially seen in the conjunctiva of the eye) and an increased heart rate.

Carbon monoxide is the most common toxic inhalant that decreases the oxygen-carrying capacity of blood. The affinity for hemoglobin to bind with carbon monoxide is greater than 200 times its affinity to bind with oxygen, creating a functional anemia. Because of the bond's strength, carbon monoxide is not easily dissociated from hemoglobin, making the hemoglobin unavailable for oxygen transport.

Decreased Inspired Oxygen Concentration. When the concentration of inspired oxygen declines, the blood has less oxygen-carrying capacity. Decreases in the fraction of inspired oxygen concentration (FiO_2) can be caused by an upper or lower airway obstruction limiting delivery of inspired oxygen to alveoli; decreased environmental oxygen, such as at high altitudes; or decreased inspiration as a result of an incorrect oxygen concentration setting on respiratory therapy equipment.

Hypovolemia. Hypovolemia is caused by conditions such as shock and severe dehydration resulting from extracellular fluid loss and reduced circulating blood volume. With a significant fluid loss, the body tries to adapt by increasing the heart rate and peripheral vasoconstriction to increase the volume of blood returned to the heart and, in turn, increase the cardiac output.

Increased Metabolic Rate. Increased metabolic activity causes increased oxygen demand. When body systems are unable to meet this increased demand, the level of oxygenation declines. An increased metabolic rate is a normal physiological response to pregnancy, wound healing, and exercise because the body is building tissue. Most people can meet the increased oxygen demand and do not display signs of oxygen deprivation. Fever increases the tissues' need for oxygen, and as a result, carbon dioxide production also increases.

If the febrile state persists, the metabolic rate remains high and the body begins to break down protein stores, resulting in muscle wasting and decreased muscle mass. Respiratory muscles such as the diaphragm and intercostal muscles are also wasted. The body attempts to adapt to the increased carbon dioxide levels by increasing the rate and depth of respiration. The patient's work of breathing increases, and the patient will eventually display signs and symptoms of hypoxemia. Patients with pulmonary diseases are at greater risk for hypoxemia and **hypercapnia** (a greater than normal amount of carbon dioxide in the blood). Assessment findings include an increased rate and depth of respiration, use of the accessory muscles of respiration, pursed-lip breathing, and decreased activity tolerance.

Conditions Affecting Chest Wall Movement. Any condition that reduces chest wall movement can result in decreased ventilation. If the diaphragm cannot fully descend with breathing, the volume of inspired air decreases, and less oxygen is delivered to the alveoli and subsequently to tissues.

Pregnancy. As the fetus grows during pregnancy, the greater size of the uterus pushes abdominal contents upward against the diaphragm. In the last trimester of pregnancy, the inspiratory capacity declines, resulting in dyspnea on exertion and increased fatigue.

Obesity. Morbidly obese patients have reduced lung volumes as a result of the heaviness of the lower thorax and abdomen, particularly when in the recumbent and supine

positions. These patients have a reduction in compliance as a result of encroachment of the abdomen into the chest, increased work of breathing, and decreased lung volumes, and they may experience fatigue and have carbon dioxide retention. In some patients, an obesity-hypoventilation syndrome develops in which oxygenation is decreased and carbon dioxide is retained, resulting in daytime sleepiness. Morbidly obese patients may also develop obstructive sleep apnea, characterized by excessive daytime somnolence and loud snoring and apneic periods during sleep. The obese patient is also susceptible to pneumonia after surgery or an upper respiratory tract infection because the lungs cannot fully expand and pulmonary secretions are not mobilized in the lower lobes.

Musculoskeletal Abnormalities. Musculoskeletal impairments in the thoracic region reduce oxygenation. Such impairments may result from abnormal structural configurations, trauma, muscular diseases, and diseases of the central nervous system. Abnormal structural configurations impairing oxygenation include those that affect the rib cage, such as pectus excavatum (an indentation of the lower sternum), and those that affect the vertebral column, such as kyphosis, lordosis, or scoliosis.

Trauma. The person with multiple rib fractures can develop a flail chest, a condition in which fractures cause instability in part of the chest wall. The unstable chest wall allows the lung underlying the injured area to contract on inspiration and bulge on expiration, resulting in hypoxia. Chest wall or upper abdominal incisions may also decrease chest wall movement as the patient uses shallow respirations to minimize chest wall movement to avoid pain. Excessive or high doses of narcotic analgesics may depress the respiratory centre, further decreasing respiratory rate and chest wall expansion.

Neuromuscular Diseases. Diseases such as muscular dystrophy affect oxygenation of tissues by decreasing the patient's ability to expand and contract the chest wall. Ventilation is impaired, and atelectasis, hypercapnia, and hypoxemia can occur. Myasthenia gravis, Guillain-Barré syndrome, and poliomyelitis affect respiratory functioning and result in hypoventilation. Myasthenia gravis interferes with normal transmission of impulses from nerves to muscles, involving the whole body, including muscles of respiration. Guillain-Barré syndrome and poliomyelitis cause inflammation and paralysis of muscle groups. Guillain-Barré syndrome usually results in an ascending pattern of paralysis. Respiratory muscles become paralyzed as paralysis ascends to the thoracic region. Poliomyelitis may lead to general or local paralysis. Both disorders may reverse, but poliomyelitis usually results in more residual paralysis.

Central Nervous System Alterations. Diseases or trauma involving the medulla oblongata and spinal cord may result in impaired respiration. When the medulla oblongata is affected, neural regulation of respiration is damaged and abnormal breathing patterns may develop. If the phrenic nerve is damaged, the diaphragm may not descend, thus reducing inspiratory lung volumes and causing hypoxemia. Cervical trauma at C3 to C5 can result in paralysis of the phrenic nerve. Spinal cord trauma below the fifth cervical vertebra usually leaves the phrenic nerve intact but damages nerves that innervate the intercostal muscles, preventing anteroposterior chest expansion.

Influences of Chronic Disease. Oxygenation can be decreased as a direct consequence of chronic disease. It can also be decreased as a secondary effect, as with anemia. The

physiological response to chronic hypoxemia is the development of a secondary polycythemia (increase in red blood cells). This adaptive response is the body's attempt to increase the amount of circulating hemoglobin to increase the available oxygen-binding sites.

Alterations in Cardiac Functioning

Illnesses and conditions that affect cardiac rhythm, strength of contraction, blood flow through the chambers, myocardial blood flow, and peripheral circulation cause alterations in cardiac functioning. Older adults experience alterations in cardiac function due to calcification of the conduction pathways, thicker and stiffer heart valves from lipid accumulation and fibrosis, and a decrease in the number of pacemaker cells in the SA node (Meiner & Leuckenotte, 2006).

Disturbances in Conduction. Some disturbances in conduction are a result of electrical impulses that do not originate from the SA node. These rhythm disturbances are called **dysrhythmias**, meaning a deviation from the normal sinus heart rhythm (Table 38-2). Dysrhythmias may occur as a primary conduction disturbance; as a response to ischemia, valvular abnormality, anxiety, or drug toxicity; as a result of caffeine, alcohol, or tobacco use; or as a complication of acid-base or electrolyte imbalance (see Chapter 39). Such disturbances may be life-threatening and require treatment with medication or defibrillation (Box 38-3).

Dysrhythmias are classified by cardiac response and site of impulse origin. Cardiac response can be tachycardiac (>100 beats/minute), bradycardiac (<60 beats/minute), a premature (early) beat, or a blocked (delayed or absent) beat. Tachydysrhythmias and bradydysrhythmias can lower cardiac output and blood pressure. Tachydysrhythmias reduce cardiac output by decreasing diastolic filling time. Bradydysrhythmias lower cardiac output because of the decreased heart rate.

Atrial fibrillation is a common type of dysrhythmia in older adults. The electrical impulse in the atria is chaotic and originates from multiple sites. The rhythm is irregular because of the multiple pacemaker sites and the unpredictable conduction to the ventricles. The QRS complex is normal; however, it occurs at irregular intervals. Atrial fibrillation is often described as an irregularly irregular rhythm.

Abnormal impulses originating above the ventricles are referred to as supraventricular dysrhythmias. The abnormality on the waveform is the configuration and placement of the P wave. Ventricular conduction usually remains normal, and a normal QRS complex is observed.

Ventricular dysrhythmias represent an ectopic site of impulse formation within the ventricles. It is ectopic in that the impulse originates in the ventricle, not the SA node. The

configuration of the QRS complex is usually widened and bizarre. P waves may or may not be present; often they are buried in the QRS complex. **Ventricular tachycardia** and **ventricular fibrillation** are life-threatening rhythms that require immediate intervention. Ventricular tachycardia is considered a life-threatening dysrhythmia because of the decreased cardiac output and the potential to deteriorate into ventricular fibrillation (American Heart Association [AHA], 2005).

Asystole is a lethal rhythm associated with no apparent electrical activity. The patient has no cardiac output and thus no palpable pulse. If the patient is on a cardiac monitor, the lack of electrical activity is noted by an absent rhythm. Asystole can occur as a primary event, it may follow ventricular fibrillation, or it can occur in patients with complete heart block. Asystole must be treated immediately.

Altered Cardiac Output. Failure of the myocardium to eject sufficient volume to the systemic and pulmonary circulations can result in heart failure. Depending on the severity of symptoms, heart dysfunction, age, and other factors, heart failure can be associated with an annual mortality rate of 5 to 50% (Arnold et al., 2006, p. 24). Primary coronary artery disease, cardiomyopathic conditions, valvular disorders, and pulmonary disease lead to myocardial pump failure.

Left-Sided Heart Failure. Left-sided heart failure is an abnormal condition characterized by impaired functioning of the left ventricle as a result of elevated pressures and pulmonary congestion. If left ventricular failure is significant, the amount of blood ejected from the left ventricle drops greatly, resulting in decreased cardiac output. Assessment findings may include decreased activity tolerance, breathlessness, dizziness, and confusion as a result of tissue hypoxia from the diminished cardiac output. As the left ventricle continues to fail, blood begins to pool in the pulmonary circulation, causing pulmonary congestion. Clinical findings include crackles on auscultation, hypoxia, shortness of breath on exertion and often at rest, cough, and paroxysmal nocturnal dyspnea.

Right-Sided Heart Failure. Right-sided heart failure results from impaired functioning of the right ventricle characterized by venous congestion in the systemic circulation. Right-sided heart failure more commonly results from pulmonary disease or from long-term left-sided failure. The primary pathological factor in right-sided failure is elevated pulmonary vascular resistance (PVR). As the PVR continues to rise, the right ventricle must generate more work, and the oxygen demand of the heart increases. As the failure continues, the amount of blood ejected from the right ventricle declines, and blood begins to "back up" in the systemic circulation. Clinically, the patient has weight gain, distended neck veins, hepatomegaly and splenomegaly, and dependent peripheral edema.

Impaired Valvular Function. Valvular heart disease is an acquired or congenital disorder of a cardiac valve characterized by stenosis and obstructed blood flow or valvular degeneration and regurgitation of blood. When stenosis occurs in the semilunar valves (aortic and pulmonic valves), the adjacent ventricles must work harder to move the ventricular volume beyond the stenotic valve. Over time, the stenosis can cause the ventricle to hypertrophy (enlarge), and if the condition is left untreated, left- or right-sided heart failure can occur. If stenosis occurs in the atrioventricular valves (mitral and tricuspid valves), the atrial pressure rises, causing the atria to hypertrophy. When regurgitation occurs, there is a backflow of blood into an adjacent chamber. For example, in mitral regurgitation, the mitral leaflets do not close completely. When the

► BOX 38-3

Automated External Defibrillator (AED)

- An automated external defibrillator is a device used to administer an electrical shock through the chest wall to the heart.
- Built-in computers assess the victim's heart rhythm and determine if defibrillation is needed.
- The AED delivers a shock to the victim.
- It can be used by nonmedical personnel.
- It is used to strengthen the chain of survival. Every minute of a sudden cardiac arrest without defibrillation decreases the survival rate by 7%–10% (Link et al., 2010, p. S706).

► **TABLE 38-2** Common Basic Cardiac Dysrhythmias

Rhythm Characteristics and Etiology

Sinus Tachycardia

Regular rhythm, rate 100–180 beats/minute (higher in infants), normal P wave, normal QRS complex.

Rate increase may be a normal response to exercise, emotion, or stressors such as pain, fever, pump failure, hyperthyroidism, and certain drugs (e.g., caffeine, nitrates, epinephrine, nicotine).



Sinus Bradycardia

Regular rhythm, rate <60 beats/minute, normal P wave, normal PR interval, normal QRS complex.

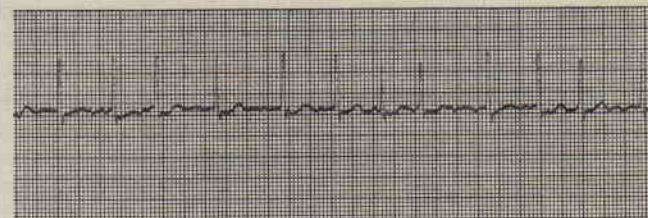
Rate decrease may be a normal response to sleep or in well-conditioned athlete; abnormal drops in rate may be caused by diminished blood flow to SA node, vagal stimulation, hypothyroidism, increased intracranial pressure, or pharmacological agents (e.g., digoxin, propranolol, quinidine, procainamide).



Atrial Fibrillation (A-fib)

Chaotic, irregular atrial activity resulting in an irregular ventricular response. No identifiable P waves. Irregular ventricular response resulting in an irregular cardiac rate and rhythm. The rate is determined by the conduction of the multiple atrial impulses across the AV node.

A-fib is caused by aging, calcification of the SA node, or changes in myocardial blood supply.



Ventricular Tachycardia

Rhythm slightly irregular, rate 100–200 beats/minute, P wave absent, PR interval absent, QRS complex wide and bizarre, >0.12 seconds.

Caused by changes in the normal pacemaker of the heart, such as decrease in blood flow, ischemia, or embolus.



Clinical Significance and Management

Patient with damaged heart may not be able to sustain increased myocardial oxygen consumption by increased heart rate.

Correct underlying causes; discontinue drugs producing the side effect.

No clinical significance unless associated with signs and symptoms of reduced cardiac output such as dizziness or syncope or presence of chest pain.

Bradycardia with hypotension and decreased cardiac output is treated with atropine; a pacemaker may be required.

There is a loss of the atrial kick (portion of the cardiac output squeezed in the ventricles with a coordinated atrial contraction), pooling of blood in the atria, and development of microemboli. The patient may complain of fatigue, a fluttering in the chest, or shortness of breath if the ventricular response is rapid. A-fib is a commonly occurring dysrhythmia in the aging and older adult. Anticoagulants such as warfarin (Coumadin) may be used to reduce the risk of stroke. Warfarin is prescribed on the basis of the international normalized ratio (INR) and thus dose adjustments are based on daily INR results.

Results in a decreased cardiac output due to decreased ventricular filling time; may lead to severe hypotension and loss of pulse and consciousness.

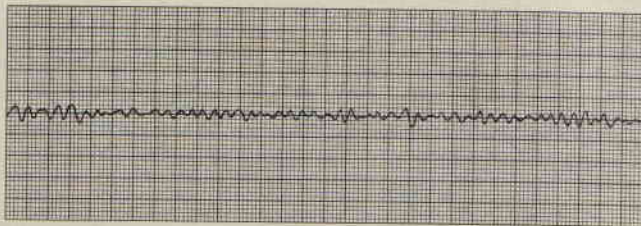
If pulseless, interventions may include defibrillation, cardiopulmonary resuscitation (CPR), epinephrine, and amiodarone (Neumar et al., 2010, p. S736).

► **TABLE 38-2** Common Basic Cardiac Dysrhythmias—cont'd

Rhythm Characteristics and Etiology

Ventricular Fibrillation

Uncoordinated electrical activity. No identifiable P, QRS, or T wave. Causes include sudden cardiac death, electrical shock, acute myocardial infarction, drowning, or trauma.



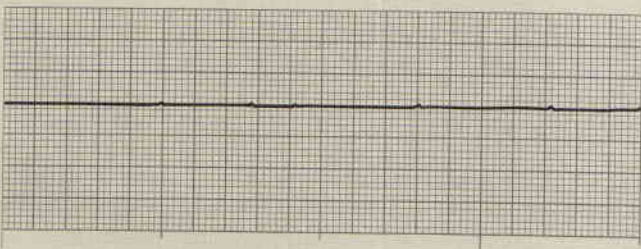
Clinical Significance and Management

Acute loss of pulse and respiration. Defibrillation, CPR, and a vasopressor may be used as initial interventions for ventricular fibrillation (Neumar et al., 2010, p. S736).

The 2010 American Heart Association Guidelines for CPR and Emergency Cardiovascular Care recommend the establishment of automated external defibrillator programs in public locations where there is a relatively high likelihood of witnessed cardiac arrest (AHA, 2010; Link et al., 2010); see Box 38-3).

Asystole

Classically referred to as a “flat line.” There are no electrical impulses and therefore no QRS complex, no contraction, and no cardiac output. Possible causes are hypoxia, hyperkalemia and hypokalemia, pre-existing acidosis, drug overdose, and hypothermia.



The unresponsive patient will have no pulse, blood pressure, or respirations. The management of asystole consists of CPR, administering epinephrine, and correction of the underlying cause (Neumar et al., 2010, p. S736).

Adapted from Canobbio, M. M. (1990). *Cardiovascular disorders*. St Louis, MO: Mosby. Diagram of “sinus tachycardia” from Ignatavicius, D. D., & Workman, M. L. (2006). *Medical-surgical nursing: Critical thinking for collaborative care* (5th ed., p. 718). Philadelphia: W. B. Saunders. Diagram of “asystole” from Aehlert, B. (2011). *ECGs made easy* (4th ed., p. 172, Fig. 6-19). St Louis, MO: Mosby.

ventricles contract, blood escapes back into the atria, causing a murmur, or “whooshing” sound (see Chapter 31).

Myocardial Ischemia. Myocardial ischemia results when the supply of blood to the myocardium from the coronary arteries is insufficient to meet the oxygen demands of the organ. Common manifestations of this ischemia include angina pectoris, myocardial infarction, and acute coronary syndrome.

Angina Pectoris. Angina pectoris is usually a transient imbalance between myocardial oxygen supply and demand. The condition results in chest pain that is aching, sharp, tingling, or burning, or that feels like pressure. The chest pain may be left-sided or substernal and may radiate to the left or both arms, and to the jaw, neck, and back. In some patients, anginal pain may not radiate. The pain can last from 1 to 15 minutes. Patients report that pain is often precipitated by activities that increase myocardial oxygen demand (e.g., exercise, anxiety, or stress). The pain is usually relieved with rest and coronary vasodilators, the most common being a nitroglycerine preparation.

Myocardial Infarction. Myocardial infarction (MI) results from sudden decreases in coronary blood flow or an increase in myocardial oxygen demand without adequate coronary perfusion. Infarction occurs because of ischemia (which is reversible) and necrosis (which is not reversible) of myocardial tissue.

Chest pain associated with MI in men is usually described as crushing, squeezing, or stabbing. The pain may be retrosternal and left precordial, and it may radiate down the left arm to the neck, jaws, teeth, epigastric area, and back. The pain occurs at rest or on exertion, lasts more than 30 minutes, and is unrelieved by rest, position change, or sublingual nitroglycerine administration.

Current research indicates that there is a significant difference between men and women with regard to coronary artery disease. Women and men do not present the same type of symptoms (Chambers et al., 2007). The most common initial symptom in women is angina. However, women may also present with atypical symptoms such as fatigue, “indigestion,” vasospasm, shortness of breath, or back or jaw pain (Denke, 2001; Shaw et al., 2006). Compared to men, women tend to have fewer Q waves and ST-segment changes with chest pain.

Acute Coronary Syndrome. Acute coronary syndrome (ACS) includes unstable angina, non-ST-segment elevation MI, and ST-segment elevation MI. There is an imbalance in the oxygen supply and demand to the myocardium. Causes include nonocclusive thrombus on pre-existing plaque, coronary vasospasm, arterial narrowing from atherosclerosis, inflammation or infection, and secondary unstable angina from anemia, fever, or hypoxemia (Granger & Miller, 2001). Symptoms may not be constant and may present atypically.

Patients with classic AMI symptoms are more easily identified. Intermediate risk factors for ACS include male gender, age greater than 70 years with diabetes mellitus, extracardiac vascular disease, fixed Q waves, and previous abnormal ST segment and T-wave changes (Granger & Miller, 2001).

Alterations in Respiratory Functioning

Illnesses and conditions that affect ventilation or oxygen transport cause alterations in respiratory functioning. The three primary alterations are hyperventilation, hypoventilation, and hypoxia.

The goal of ventilation is to produce a normal arterial carbon dioxide tension (PaCO_2) between 35 and 45 mm Hg and maintain a normal arterial oxygen tension (PaO_2) between 80 and 100 mm Hg. Hyperventilation and hypoventilation refer to alveolar ventilation and not to the patient's respiratory rate. Arterial oxygen levels can be monitored using a noninvasive oxygen saturation monitor. The normal range is 95% to 100%. Hypoxia refers to a decrease in the amount of arterial oxygen.

Hyperventilation. Hyperventilation is a state of ventilation in excess of that required to eliminate the normal venous carbon dioxide produced by cellular metabolism. Anxiety, infections, drugs, or an acid–base imbalance can induce hyperventilation, as well as hypoxia associated with pulmonary embolus or shock. Acute anxiety can lead to hyperventilation and may cause loss of consciousness from excess carbon dioxide exhalation. Fever can cause hyperventilation. As a patient's body temperature increases, there is an increase in the metabolic rate, thereby increasing carbon dioxide production. The clinical response is an increased rate and depth of respiration.

Hyperventilation may also be chemically induced. Salicylate (aspirin) poisoning causes excessive stimulation of the respiratory centre as the body attempts to compensate for excess carbon dioxide. Amphetamines also increase ventilation by raising carbon dioxide production. Hyperventilation can also occur as the body tries to compensate for metabolic acidosis by producing a respiratory alkalosis. For example, the diabetic patient who has gone into diabetic ketoacidosis is producing large amounts of metabolic acids. The respiratory system tries to correct the acid–base balance by overbreathing. Ventilation increases to reduce the amount of carbon dioxide available to form carbonic acid (see Chapter 39). Hemoglobin does not release oxygen to tissues as readily, and tissue hypoxia results. As symptoms worsen, the patient may become more agitated, which further increases the respiratory rate and can result in respiratory alkalosis.

Hypoventilation. Hypoventilation occurs when alveolar ventilation is inadequate to meet the body's oxygen demand or to eliminate sufficient carbon dioxide. As alveolar ventilation decreases, PaCO_2 is elevated. Severe atelectasis can produce hypoventilation. **Atelectasis** is a collapse of the alveoli that prevents normal respiratory exchange of oxygen and carbon dioxide. As alveoli collapse, less of the lung can be ventilated and hypoventilation occurs.

In patients with COPD, the inappropriate administration of excessive oxygen can result in hypoventilation. These patients have adapted to a high carbon dioxide level, and their carbon dioxide–sensitive chemoreceptors are essentially not functioning. Their stimulus to breathe is a decreased PaO_2 . If excessive oxygen is administered, the oxygen requirement is satisfied and the stimulus to breathe is negated. High concentrations of

oxygen (e.g., >24%–28% [1–3 L/minute]) prevent the PaO_2 from falling and obliterate the stimulus to breathe, resulting in hypoventilation. The excessive retention of carbon dioxide may lead to respiratory arrest.

Signs and symptoms of hypoventilation include mental status changes, dysrhythmias, and potential cardiac arrest. Treatment requires improving tissue oxygenation, restoring ventilatory function, treating the underlying cause of the hypoventilation, and achieving acid–base balance. If untreated, the patient's status can rapidly decline, leading to convulsions, unconsciousness, and death.

Hypoxia. Hypoxia is inadequate tissue oxygenation at the cellular level. This can result from a deficiency in oxygen delivery or oxygen utilization at the cellular level. Hypoxia can be caused by (a) a decreased hemoglobin level and lowered oxygen-carrying capacity of the blood; (b) a diminished concentration of inspired oxygen, which may occur at high altitudes; (c) the inability of the tissues to extract oxygen from the blood, as with cyanide poisoning; (d) decreased diffusion of oxygen from the alveoli to the blood, as in pneumonia; (e) poor tissue perfusion with oxygenated blood, as with shock; and (f) impaired ventilation, as with multiple rib fractures or chest trauma.

The clinical signs and symptoms of hypoxia include apprehension, restlessness, inability to concentrate, declining level of consciousness, dizziness, and behavioural changes. The patient with hypoxia is unable to lie down and appears fatigued and agitated. Vital sign changes include an increased pulse rate and increased rate and depth of respiration. The patient with a narcotic overdose, such as a heroin overdose, may display signs of hypoventilation. During early stages of hypoxia, the blood pressure is elevated unless the condition is caused by shock. As the hypoxia worsens, the respiratory rate may decline as a result of respiratory muscle fatigue.

Cyanosis, or blue discolouration of the skin and mucous membranes caused by the presence of desaturated hemoglobin in capillaries, is a late sign of hypoxia. The presence or absence of cyanosis is not a reliable measure of oxygenation status. Central cyanosis, observed in the tongue, soft palate, and conjunctiva of the eye, where blood flow is high, indicates hypoxemia. Peripheral cyanosis, seen in the extremities, nail beds, and earlobes, is often a result of vasoconstriction and stagnant blood flow. Hypoxia is a life-threatening condition. Untreated, it can produce cardiac dysrhythmias that result in death. Hypoxia is managed by administration of oxygen and treatment of the underlying cause, such as airway obstruction.

Nursing Knowledge Base

Developmental Factors

The developmental stage of the patient and the normal aging process can affect tissue oxygenation.

Infants and Toddlers. Infants and toddlers are at risk for upper respiratory tract infections as a result of frequent exposure to other children and exposure to second-hand smoke. In addition, during the teething process, some infants develop nasal congestion, which encourages bacterial growth and increases the potential for respiratory tract infection. Upper respiratory tract infections are usually not dangerous, and infants or toddlers recover with little difficulty.

School-Aged Children and Adolescents. School-aged children and adolescents are exposed to respiratory infections and respiratory risk factors such as second-hand smoke

* BOX 38-4 FOCUS ON OLDER ADULTS

- The tuberculin skin test is an unreliable indicator of tuberculosis in older patients. They frequently display false-positive or false-negative skin test reactions.
- Older patients are at an increased risk for reactivation of dormant organisms that have been present for decades, as a result of age-related changes in the immune system.
- The standard 5-TU Mantoux test is given and repeated or repeated with the 250-TU strength to create a booster effect.
- If the older patient has a positive reaction, a complete history is necessary to determine any risk factors.
- Older adults have more atypical signs and symptoms of coronary artery disease (Meiner & Leuckenotte, 2006).
- The incidence of atrial fibrillation increases with age and is the leading contributing factor for stroke in the older adult (Meiner & Leuckenotte, 2006).
- Mental status changes are often the first signs of respiratory problems and may include forgetfulness and irritability.
- Older adults may not complain of dyspnea until it affects the activities of daily living that are important to them.
- Changes in the older adult's cough mechanism may lead to retention of pulmonary secretions, airway plugging, and atelectasis, if cough suppressants are not used with caution.



and cigarette smoking. A healthy child usually does not have adverse pulmonary effects from respiratory infections. A person who starts smoking in adolescence and continues to smoke into middle age, however, has an increased risk for cardiopulmonary disease and lung cancer.

Young and Middle-Aged Adults. Young and middle-aged adults are exposed to multiple cardiopulmonary risk factors: an unhealthy diet, lack of exercise, stress, over-the-counter and prescription drugs not used as intended, illegal drugs, and smoking. By reducing these modifiable factors patients may decrease their risk for cardiac or pulmonary diseases. During youth and middle age, lifelong habits and lifestyles are established. It is thus important to help these patients make good choices and informed decisions about the rest of their lives and their health care practices.

Older Adults. The cardiac and respiratory systems undergo changes throughout the aging process (Box 38-4). The changes are associated with calcification of the heart valves, SA node, and costal cartilages. The arterial system develops atherosclerotic plaques. Osteoporosis leads to changes in the size and shape of the thorax.

The trachea and large bronchi become enlarged from calcification of the airways. The alveoli enlarge, decreasing the surface area available for gas exchange. The number of functional cilia is reduced, causing a decrease in the effectiveness of the cough mechanism, putting the older adult at increased risk for respiratory infections (Meiner & Leuckenotte, 2006). Ventilation and transfer of respiratory gases decline with age because the lungs are unable to expand fully, leading to lower oxygenation levels.

Lifestyle Risk Factors

Lifestyle modifications that influence cardiopulmonary functioning are frequently difficult because a patient is being asked to change a habit or behaviour that may be enjoyed, such as

* BOX 38-5 FOCUS ON PRIMARY HEALTH CARE

Positive Lifestyle Practices for Cardiopulmonary Health Promotion

As part of a primary health care focus, it is important to educate young to older adults about the following lifestyle practices that promote cardiopulmonary health:

- Maintain ideal body weight.
- Eat a low-fat, low-salt, calorie-appropriate diet.
- Engage in regular aerobic exercise one hour daily.
- Use a filter mask when exposed to occupational hazards.
- Use stress-reduction techniques.
- Reduce exposure to secondary infections.
- Do not smoke.
- Avoid second-hand smoke and other pollutants.
- Have annual visits with a health care provider.
- Monitor blood pressure.
- Monitor cholesterol and triglyceride levels.
- Request an annual influenza vaccine, especially if at risk for the development of influenza.
- Request a pneumococcal vaccine, if appropriate.



cigarette smoking or eating certain foods; however, these changes can be achieved with encouragement, support, and time (Box 38-5). Risk factor modification is important and includes smoking cessation, weight reduction, a low-cholesterol and low-sodium diet, management of hypertension, and moderate exercise. Although it may be difficult to get older adults to change long-term behaviour, developing healthy behaviours can slow or halt the progression of their cardiopulmonary disease (Meiner & Leuckenotte, 2006).

Poor Nutrition. Nutrition affects cardiopulmonary function in several ways. Severe obesity decreases lung expansion, and the increased body weight increases oxygen demands to meet metabolic needs. The malnourished patient may experience respiratory muscle wasting, resulting in decreased muscle strength and respiratory excursion. Cough efficiency is reduced secondary to respiratory muscle weakness, putting the patient at risk for retention of pulmonary secretions. Diets high in fat increase cholesterol and atherogenesis in the coronary arteries.

Patients who are morbidly obese, malnourished, or both are at risk for anemia. Diets high in carbohydrates may play a role in increasing the carbon dioxide load for patients with carbon dioxide retention. As carbohydrates are metabolized, an increased load of carbon dioxide is created and excreted via the lungs.

Dietary sodium reduction could eliminate hypertension for over a million Canadians (Joffres et al., 2007, p. 441). Diets high in potassium may prevent hypertension and help improve control in patients with hypertension. A 2000-calorie diet high in fibre, potassium, calcium, and magnesium, with an emphasis on fruits, vegetables, and low-fat dairy foods and low in saturated and total fat, is recommended to help prevent and reduce the effects of hypertension (Joint National Committee [JNC], 2003).

Inadequate Exercise. Exercise increases the body's metabolic activity and oxygen demand. The rate and depth of respiration increase, enabling the person to inhale more oxygen and exhale excess carbon dioxide. A physical exercise program

has many benefits (see Chapter 35). People who exercise for one hour daily have a lower pulse rate and blood pressure, decreased cholesterol level, increased blood flow, and greater oxygen extraction by working muscles. Fully conditioned people can increase oxygen consumption by 10% to 20% because of increased cardiac output and increased efficiency of the myocardial muscle (JNC, 2003).

Smoking. Cigarette smoking is associated with a number of diseases, including heart disease, chronic obstructive lung disease, and lung cancer. Smoking is a risk factor for heart disease, stroke, cancer, and respiratory disease (Heart and Stroke Foundation of Canada, 2008). Inhaled nicotine causes vasoconstriction of peripheral and coronary blood vessels, increasing blood pressure and decreasing blood flow to peripheral vessels. Women who take birth control pills and smoke cigarettes are at increased risk for cardiovascular problems such as thrombophlebitis and pulmonary emboli.

Cigarette smoking is the major cause of lung cancer, accounting for 85% of all new cases of lung cancer in Canada (Health Canada, 2011). Regular exposure to second-hand smoke increases the chances of contracting lung disease by 25% and heart disease by 10% (Health Canada, 2007). Lung cancer is the leading cause of cancer death for both men and women (Canadian Cancer Society, 2011). It is estimated that 1 in 11 men and 1 in 15 women will develop lung cancer in their lifetime (Canadian Cancer Society, 2011). The 5-year survival rate (2004–2006) for females with lung cancer is 19% and in males 13% (Canadian Cancer Society, 2011). If lung cancer is detected when the disease is still localized, the survival rate is 49%. However, lung cancer is often diagnosed only when it has reached an advanced stage. If a substantial number of health care providers implement even minimal smoking cessation interventions, there will be a decrease in related tobacco diseases (Registered Nurses' Association of Ontario [RNAO], 2007, p. 13). RNAO (2007) has developed best practice guidelines and recommendations for nurses as they assist their patients with smoking cessation (see RNAO Best Practice Guideline *Integrating Smoking Cessation Into Daily Nursing Practice*).

Substance Abuse. Excessive use of alcohol and other drugs can impair tissue oxygenation in two ways. First, the person who chronically abuses substances often has a poor nutritional intake. With the resultant decrease in intake of iron-rich foods, hemoglobin production declines. Second, excessive use of alcohol and certain other drugs can depress the respiratory centre, reducing the rate and depth of respiration and the amount of inhaled oxygen. Substance abuse by either smoking or inhaling, such as crack cocaine or inhaling fumes from paint or glue cans, causes direct injury to lung tissue that can lead to permanent lung damage and impaired oxygenation.

Stress. A continuous state of stress or severe anxiety increases the body's metabolic rate and the oxygen demand. The body responds to anxiety and other stresses with an increased rate and depth of respiration. Most people can adapt, but some, particularly those with chronic illnesses or acute life-threatening illnesses such as a myocardial infarction, cannot tolerate the oxygen demands associated with anxiety (see Chapter 29).

Environmental Factors

The environment can also influence oxygenation. The incidence of pulmonary disease is higher in smoggy, urban areas than in rural areas. In addition, the patient's workplace may

increase the risk for pulmonary disease. Some occupational pollutants are asbestos, talcum powder, dust, and airborne fibres. Asbestosis is an occupational lung disease that develops after exposure to asbestos. The lung in asbestosis is characterized by diffuse interstitial fibrosis, creating a restrictive lung disease. It can also cause pleural mesotheliomas and pleural plaques. Patients at risk for developing asbestosis include those working with textiles, fireproofing, or milling, or in the production of paints, plastics, or some prefabricated construction. Patients exposed to asbestos who also smoke are at increased risk of developing lung cancer.

Critical Thinking

Successful critical thinking requires a synthesis of knowledge, experience, information gathered from patients, critical thinking qualities, and intellectual and professional standards. Clinical judgements require you to anticipate the information necessary, analyze the data, and make decisions regarding the patient's care. During the assessment, consider all elements that build toward making an appropriate nursing diagnosis (Figure 38-6).

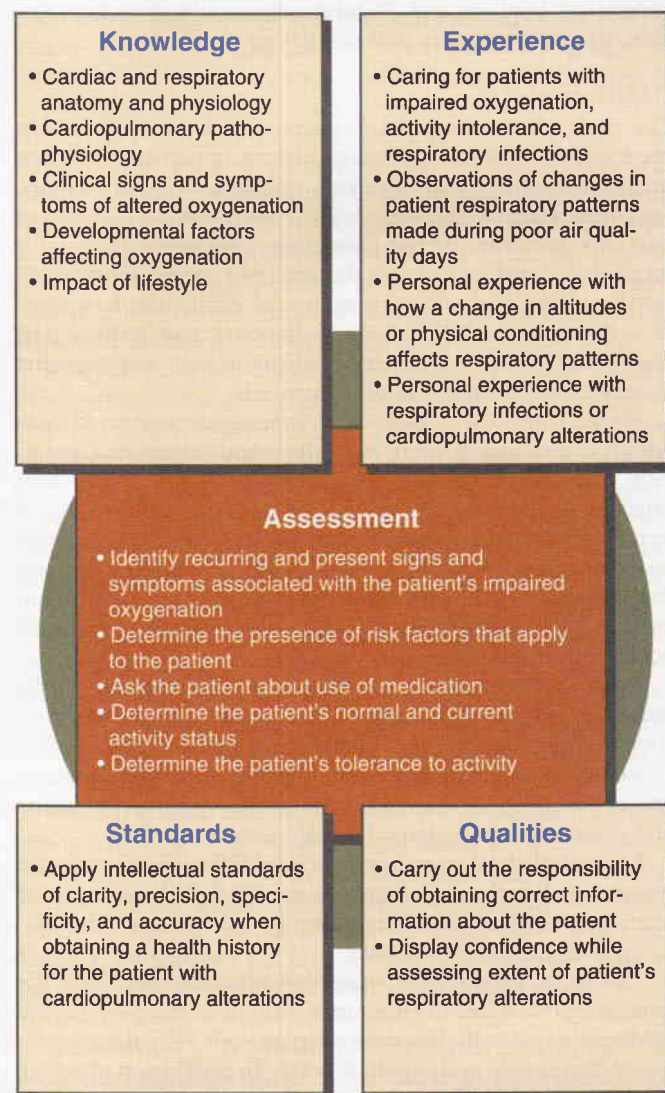


Figure 38-6 Critical thinking model for oxygenation assessment.

To understand the oxygen demands of a patient and the ability of the patient's body to meet those demands, you need to integrate knowledge from nursing and other disciplines, previous experiences, and information gathered from patients. Professional standards, such as those developed by the Heart and Stroke Foundation of Canada, the Canadian Lung Association, the Canadian Thoracic Society, and the Canadian Infectious Diseases Society, provide valuable guidelines for the care and management of patients with altered oxygenation.

Nursing Process

◆ Assessment

The nursing assessment of a patient's cardiopulmonary functioning includes an in-depth history of the patient's normal and present cardiopulmonary function, past impairments in circulatory or respiratory functioning, and measures that the patient uses to optimize oxygenation. The history should include a review of drug, food, and other allergies, such as pet dander, mould, and environmental triggers.

Physical examination of the patient's cardiopulmonary status reveals the extent of existing signs and symptoms. A review of laboratory and diagnostic test results provides valuable data on respiratory and ventilatory parameters.

Health History

The health history should focus on the patient's ability to meet oxygen needs. The health history for cardiac function includes pain and characteristics of pain, dyspnea, fatigue, peripheral circulation, cardiac risk factors, and the presence of past or concurrent cardiac conditions. The health history for respiratory function includes presence of a cough, shortness of breath, wheezing, pain, environmental exposures, frequency of respiratory tract infections, pulmonary risk factors, past respiratory problems, current medication use, and smoking history or second-hand smoke exposure.

Pain. Chest pain needs to be thoroughly evaluated with regard to location, duration, radiation, and frequency. Cardiac pain does not occur with respiratory variations and is most often on the left side of the chest and radiates to the left arm in men. Chest pain in women is much less definitive and may be a sensation of choking, breathlessness, or pain that radiates through to the back. Pericardial pain resulting from an inflammation of the pericardial sac is usually nonradiating and may occur with inspiration.

Pleuritic chest pain is peripheral and may radiate to the scapular regions. It is worsened by inspiratory manoeuvres, such as coughing, yawning, and sighing. Pleuritic pain is often caused from an inflammation or infection in the pleural space and is described as knifelike, lasting from a minute to hours and always in association with inspiration.

Musculoskeletal pain may be present following exercise, rib trauma, and prolonged coughing episodes. This pain is also aggravated by inspiratory movements and may easily be confused with pleuritic chest pain.

Fatigue. Fatigue is a subjective sensation in which the patient reports a loss of endurance. Fatigue in the patient with cardiopulmonary alterations is often an early sign of a worsening of the chronic underlying process. To provide an objective measure of fatigue, the patient may be asked to rate the fatigue on a scale of 0 to 10, with 10 being the worst level of fatigue and 0 representing no fatigue.

Smoking. It is important to determine patients' direct and secondary exposure to cigarette smoke. Ask the patient about any history of smoking; include the number of years smoked and the number of packages smoked per day. This is recorded as pack-year history. For example, if a patient smoked two packs a day for 20 years, the patient would have a 40 pack-year history (packages per day × years smoked).

It is also important to determine if the patient is exposed to second-hand smoke from family or co-workers. Exposure to second-hand smoke increases the patient's risk for chronic lung or cardiac diseases.

Dyspnea. Dyspnea is a clinical sign of hypoxia and manifests as breathlessness. It is the subjective sensation of difficult or uncomfortable breathing. Dyspnea is shortness of breath associated with exercise or excitement, but in some patients dyspnea may be present without any relation to activity or exercise. Dyspnea is associated with many conditions, such as pulmonary diseases, cardiovascular diseases, neuromuscular conditions, and anemia. Guidelines have been developed by the Registered Nurses' Association of Ontario (RNAO, 2005) to address nursing assessment and management of patients experiencing dyspnea associated with COPD (see the RNAO's Best Practice Guideline, *Nursing Care of Dypnea: The 6th Vital Sign in Individuals With Chronic Obstructive Pulmonary Disease [COPD]*). In addition, dyspnea may occur in the pregnant woman in the final months of pregnancy. Environmental factors, such as pollution, cold air, and smoking, may also cause or worsen dyspnea.

Dyspnea can be associated with clinical signs such as exaggerated respiratory effort, use of the accessory muscles of respiration, nasal flaring, and marked increases in the rate and depth of respirations (Jevon & Ewens, 2001). The use of a visual analogue scale (VAS) can help patients make an objective assessment of their dyspnea. The VAS is a 100-mm vertical line with end points of 0 and 10. Zero is equated with no dyspnea and 10 is equated with the worst breathlessness the patient has experienced. Studies have validated the use of the VAS to evaluate a patient's dyspnea in the clinical setting. Evaluate the effectiveness of nursing interventions by monitoring the patient's assessment of their dyspnea.

If the patient has a history of dyspnea, determine the circumstances under which it occurred, such as with exertion, stress, or respiratory tract infection. Determine whether the patient's perception of dyspnea affects the ability to lie flat. **Orthopnea** is an abnormal condition in which the person must use multiple pillows when lying down or must sit with the arms elevated and leaning forward to breathe. The number of pillows required for sleeping, such as two- or three-pillow orthopnea, usually quantifies the presence of orthopnea.

Cough. Cough is a sudden, audible expulsion of air from the lungs. The person breathes in, the glottis is partially closed, and the accessory muscles of expiration contract to expel the air forcibly. Coughing is a protective reflex to clear the trachea, bronchi, and lungs of irritants and secretions. The carina, the point of bifurcation of the right and left mainstem bronchus, is the most sensitive area for cough production. A cough is difficult to evaluate, and almost everyone has periods of coughing. Patients with a chronic cough tend to deny, underestimate, or minimize their coughing, often because they are so accustomed to it that they are unaware of how frequently it occurs.

Coughing is classified according to the time when the patient most frequently coughs. Patients with chronic sinusitis may cough only in the early morning or immediately after

BOX 38-6 Sputum Characteristics

Colour

Clear
White
Yellow
Green
Brown
Red
Streaked with blood

Changes in Colour

Same colour throughout the day
Clearing with coughing
Progressively darker

Odour

None
Foul

Quantity

Same as usual
Increased
Decreased

Consistency

Frothy
Watery
Tenacious, thick

Presence of Blood

Occasional
Early morning
Bright or dark red
Blood tinged

rising from sleep. This clears the airway of mucus resulting from sinus drainage. Patients with chronic bronchitis generally produce sputum all day, although greater amounts are produced after rising from a semi-recumbent or flat position. This is a result of the dependent accumulation of sputum in the airways and is associated with reduced mobility (see Chapter 45). When a patient has a cough, determine its frequency and whether it is productive or nonproductive. A productive cough results in sputum production, material coughed up from the lungs that may be swallowed or expectorated. Sputum contains mucus, cellular debris, and microorganisms, and it may contain pus or blood. Collect data about the type and quantity of sputum. Instruct the patient to try to produce some sputum, being careful not to simply clear the throat to produce a sample of saliva. Then inspect it for colour, consistency, odour, and amount (Box 38-6).

If **hemoptysis** (bloody sputum) is reported, determine if it is associated with coughing and bleeding from the upper respiratory tract, from sinus drainage, or from the gastrointestinal tract (**hematemesis**). In addition, the hemoptysis should be described according to amount, colour, and duration and whether it is mixed with sputum. When the patient reports bloody or blood-tinged sputum, diagnostic tests, such as examination of sputum specimens, chest X-ray examinations, **bronchoscopy**, and other X-ray studies, should be performed.

Wheezing. Wheezing is characterized by a high-pitched musical sound caused by high-velocity movement of air through a narrowed airway. Wheezing may be associated with asthma, acute bronchitis, or pneumonia. Wheezing can occur on inspiration, expiration, or both. Determine if there are any precipitating factors, such as respiratory infection, allergens, exercise, or stress.

Environmental or Geographical Exposures. Environmental exposure to many inhaled substances is closely linked with respiratory disease. Investigate exposures in the patient's home and workplace. The most common environmental exposures in the home are cigarette smoke, carbon monoxide, and radon. In addition, determine whether a patient who is a nonsmoker is passively exposed to smoke.

Carbon monoxide poisoning can result from a blocked furnace flue or fireplace. The patient may have vague complaints of general malaise, flu-like symptoms, and excessive

sleepiness. Patients are particularly at risk in the late fall when they turn the heat on or begin to use the fireplace again. Radon gas, a radioactive substance that can damage lung tissue and cause lung cancer, enters homes through the ground. When homes are underventilated, this gas is not able to escape into the atmosphere and becomes trapped in the home.

Obtain an employment history to assess exposure to substances such as asbestos, coal, cotton fibres, fumes, or chemical inhalants. This is particularly important with middle-aged and older adults, who may have worked in places without regulations to protect workers from carcinogens such as asbestos.

Exposure to pathogens may occur during travel. Schistosomiasis can be acquired in Asia, Africa, the Caribbean, and South America. This is infection of a human with a species of fluke found in fresh water that has been contaminated by human feces. Coccidioidomycosis is a fungal disease caused by inhalation of *Coccidioides immitis*, a wind-borne spore carried on dust particles.

Respiratory Infections. A health history should contain information about the patient's frequency and duration of respiratory tract infections. Although everyone occasionally experiences a cold, for some people it can result in bronchitis or pneumonia. On average, patients will have four colds per year. Determine if the patient has had a pneumococcal or flu vaccine in the past and ask about any known exposure to tuberculosis (TB) and the results of the tuberculin skin test.

Determine the patient's risk for human immunodeficiency virus (HIV) infection. Patients with a history of intravenous (IV) drug use and multiple unprotected sexual partners are at risk of developing HIV infection. Patients may not display any symptoms of HIV infection until they present with *Pneumocystis carinii* (PCP) or *Mycoplasma pneumonia*. Presentation with PCP or *Mycoplasma pneumonia* indicates a significant depression of the patient's immune system and progression to acquired immune deficiency syndrome (AIDS).

Allergies. When obtaining a respiratory system history, inquire about airborne allergens. The patient's allergic response may be watery eyes, sneezing, runny nose, or respiratory symptoms, such as cough or wheezing. Ask the patient specific questions about the type of allergens, response to these allergens, and successful and unsuccessful relief measures. In addition, determine the impact that environmental air quality and second-hand smoke exposure has on the patient's allergy and symptoms.

Safe nursing practice also includes obtaining information about food, drug, or insect-sting allergies. These data are usually obtained on initial history and physical examination. However, always double-check this information with the patient, especially when obtaining information about respiratory allergens.

Health Risks. Investigate familial risk factors, such as a family history of lung cancer or cardiovascular disease. Documentation should include which blood relatives have had the disease and their present level of health or age at time of death. Other family risk factors include the presence of infectious diseases, particularly TB. It is important to determine who in the patient's household has been infected and the status of treatment.

Medications. The health history should also list medications the patient is using. These could include prescribed, over-the-counter, folk medicine, herbal medicines, alternative therapies, and illicit drugs and substances. Such medications may have adverse effects by themselves or through interactions

► **TABLE 38-3** Assessment Findings in the Aging Cardiopulmonary System

Function	Pathophysiological Change	Key Clinical Findings
Heart		
Muscle contraction	Thickening of the ventricular wall, increased collagen and decreased elastin in the heart muscle	Decreased cardiac output Diminished cardiac reserve
Blood flow	Heart valves become thicker and stiffer, more often in the mitral and aortic valves.	Systolic ejection murmur
Conduction system	The SA node becomes fibrotic from calcification; the number of pacemaker cells in the SA node decreases.	Increased PR, QRS, and Q-T intervals, decreased amplitude of the QRS complex
Arterial vessel compliance	Vessels become calcified, loss of arterial distensibility, decreased elastin in the vessel walls, more bends and twists (tortuous) in the vessels	Hypertension, with an increase in systolic blood pressure Fluctuation in blood pressure
Lungs		
Breathing mechanics	Decreased chest wall compliance, loss of elastic recoil Decreased respiratory muscle mass/strength	Prolonged exhalation phase Decreased vital capacity
Oxygenation	Increased ventilation-perfusion mismatch Decreased alveolar surface area Decreased carbon dioxide diffusion capacity	Decreased PaO ₂ (arterial oxygen tension) Decreased cardiac output Slightly increased PaCO ₂ (arterial carbon dioxide tension)
Breathing control/ breathing pattern	Decreased responsiveness of central and peripheral chemoreceptors to hypoxemia and hypercapnia	Increased respiratory rate Decreased tidal volume
Lung defence mechanisms	Decreased number of cilia Decreased IgA production and humoral and cellular immunity	Decreased airway clearance Diminished cough reflex
Sleep and breathing	Decreased respiratory drive Decreased tone of upper airway muscles	Increased risk of aspiration and infection Decreased PaO ₂ Snoring, obstructive sleep apnea

with other drugs. A person using a prescribed bronchodilator drug, for example, may decide that using an over-the-counter inhalant as well will be beneficial. Many of these contain ephedrine or ma huang, a natural chemical that acts like epinephrine. This product may react with the prescribed medication by potentiating or decreasing the effect of the prescribed medication. Patients taking warfarin (Coumadin) for blood thinning will prolong the prothrombin time (international normalized ratio [INR]) results if they are taking ginkgo biloba, garlic, or ginseng with the anticoagulant. The drug interaction could precipitate a life-threatening bleed.

safety alert During history taking, ask patients to list all of the over-the-counter and herbal supplements they are taking to ensure that medication interactions do not develop.

When patients are prescribed drugs for which toxic levels can be monitored by blood analyses, you need to review these laboratory values. Common drugs that can be monitored are theophylline (theophylline levels), digitalis preparations (digitalis levels), anticoagulants such as warfarin (Coumadin; INR level), and phenobarbital (phenobarbital levels). Toxic effects of these medications can impair cardiopulmonary functioning.

It is important to determine whether a patient uses illicit drugs. These drugs, particularly parenterally administered narcotics, which are often diluted with talcum powder, can cause pulmonary disorders resulting from the irritant effect of the powder on lung tissues.

As with all medication, assess the patient's knowledge and ability to self-administer medications correctly (see Chapter 33). Of particular importance is the assessment of the patient's understanding of potential side effects of the medications.

Patients should be able to recognize adverse reactions and be aware of the dangers in combining prescribed medications with over-the-counter drugs.

Physical Examination

The physical examination performed to assess the patient's level of tissue oxygenation includes evaluation of the cardiopulmonary system (see Chapter 31). Special consideration should be given when assessing the older patient because changes in the cardiopulmonary system occur with the aging process (Table 38-3). These changes may result in changes in the patient's activity tolerance, level of fatigue, or transient changes in vital signs and may not be associated with a specific cardiopulmonary disease.

Inspection. Using inspection techniques, perform a head-to-toe observation of the patient for skin and mucous membrane colour, general appearance, level of consciousness, adequacy of systemic circulation, breathing patterns, and chest wall movement (Table 38-4). Any abnormalities should be investigated during palpation, percussion, and auscultation.

Inspection includes observations of the nails for clubbing. Clubbed nails, obliteration of the normal angle between the base of the nail and the skin, are seen in patients with prolonged oxygen deficiency, endocarditis, and congenital heart defects.

Observe the chest wall movement for retraction, sinking in of soft tissues of the chest between the intercostal spaces. Also observe for paradoxical breathing, asynchronous breathing, and the patient's breathing pattern (Table 38-5). In paradoxical breathing, the chest wall contracts during inspiration and expands during exhalation. Infants can experience sternal and substernal chest wall retractions with only a slight inspiratory effort because of the pliability of the chest wall. Note the anteroposterior diameter of the chest wall. Conditions such as

► **TABLE 38-4** **Inspection of Cardiopulmonary Status**

Abnormality	Cause
Eyes	
Xanthelasma (yellow lipid lesions on eyelids)	Hyperlipidemia
Corneal arcus (whitish opaque ring around junction of cornea and sclera)	Hyperlipidemia in young to middle-aged adults, normal finding in older adults with arcus senilis
Pale conjunctivae	Anemia
Cyanotic conjunctivae	Hypoxemia
Petechiae on conjunctivae	Fat embolus or bacterial endocarditis
Mouth and Lips	
Cyanotic mucous membranes	Decreased oxygenation (hypoxia)
Pursed-lip breathing	Associated with chronic lung disease
Neck Veins	
Distension	Associated with right-sided heart failure
Nose	
Flaring nares	Air hunger, dyspnea
Chest	
Retractions	Increased work of breathing, dyspnea
Asymmetry	Chest wall injury
Skin	
Peripheral cyanosis	Vasoconstriction and diminished blood flow
Central cyanosis	Hypoxemia
Decreased skin turgor	Dehydration (normal finding in older adults as a result of decreased skin elasticity)
Dependent edema	Associated with right-sided heart failure
Periorbital edema	Associated with kidney disease
Fingertips and Nail Beds	
Cyanosis	Decreased cardiac output or hypoxia
Splinter hemorrhages	Bacterial endocarditis
Clubbing	Chronic hypoxemia

Source: Potter, P. A., & Weillitz, P. B. (2007). *Health assessment: Pocket guide series* (6th ed.). St. Louis, MO: Mosby.

emphysema, advancing age, and COPD can cause the chest to assume a rounded shape.

Palpation. Palpation of the chest provides assessment data in several areas. It documents the type and amount of thoracic excursion, elicits any areas of tenderness, and can identify tactile fremitus, thrills, heaves, and the cardiac point of maximal impulse (PMI). Palpation also aids in detecting abnormal masses or lumps in the axilla and breast tissue. Palpation of the extremities provides data about the peripheral circulation, the presence and quality of peripheral pulses, skin temperature, colour, and capillary refill (see Chapter 31).

Palpation should also include the feet and legs to assess the presence or absence of peripheral edema. Patients with alterations in their cardiac function, such as those with congestive

heart failure or hypertension, often have pedal or lower extremity edema. Edema is graded from 1+ to 4+, depending on the depth of visible indentation after firm application of a finger (see Chapter 31).

Palpation of the pulses in the neck and extremities is performed to assess arterial blood flow (see Chapter 31 and Box 38-7). A scale of 0 (absent pulse) to 3+ (full, bounding pulse) is used to describe what is palpated. The normal pulse is graded at 2+, and a weak, thready pulse is graded as 1+.

Percussion. Percussion is used to detect the presence of abnormal fluid or air in the lungs. It also aids in determining diaphragmatic excursion (see Chapter 31).

Auscultation. Auscultation helps in identifying normal and abnormal heart and lung sounds (see Chapter 31). Auscultation of the cardiovascular system should include assessment for normal S₁ and S₂ sounds, the presence of abnormal S₃ and S₄ sounds (gallops), and murmurs or rubs. Auscultation is also used to identify a bruit over the carotid arteries, abdominal aorta, and femoral arteries.

Auscultation of lung sounds involves listening for movement of air throughout all lung fields: anterior, posterior, and lateral. Adventitious breath sounds occur with collapse of a lung segment, fluid in a lung segment, or narrowing or obstruction of an airway. Auscultation also evaluates the patient's response to interventions for improving the respiratory status.

Diagnostic Tests

There are a variety of diagnostic tests to monitor cardiopulmonary functioning. Some of these tests can be obtained through screening, simple blood specimens, X-ray films, or other non-invasive means. One such screening mechanism is TB skin testing (Box 38-8). This is a simple test that is usually required annually for health care workers to monitor possible TB exposure. In contrast, invasive diagnostic tests, such as a thoracentesis, can be quite painful, depending on the patient's tolerance for pain.

Tables 38-6 and 38-7 and Box 38-9 summarize diagnostic testing used in the assessment and evaluation of patients with cardiopulmonary alterations. Explain the procedure and tell the patient what to expect, to reduce the patient's anxiety. The patient must understand the importance of following instructions, such as holding the breath as requested and not coughing during the procedure. After any procedure, monitor the patient for signs of changes in cardiopulmonary functioning, sudden shortness of breath, pain, oxygen desaturation, and anxiety. Promote the patient's comfort and encourage the patient to rest after the test, because many patients find these tests to be tiring.

Patient Expectations

Ask patients what they expect from the encounter and what their priority is for management of their health. In identifying expectations, you involve patients in the decision-making process and allow them to participate in their care and know what will happen to them. For example, if you plan a smoking-cessation or weight-reduction program for a patient who is not ready for the change, both you and the patient will become frustrated. Establish short-term, realistic goals that build to a larger goal. For example, reducing the fat in the patient's diet might start out with replacing food such as whole milk with 2% milk and gradually introducing skim milk. A sudden change from whole to skim milk will most likely fail, because the change is too much. A plan for adding exercise to the

► **TABLE 38-5** Assessment of Breathing Pattern**Pattern and Rate (Breaths/Minute)**

Eupnea (12–20)



Tachypnea (>20)



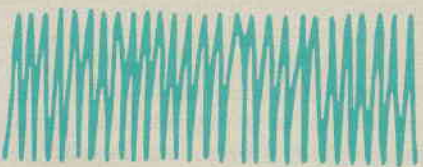
Bradypnea (<12)



Apnea (absence of respiration >15 seconds)



Kussmaul's respirations (usually >35, may be slow or normal)

**Clinical Significance**

Normal rate in the adult

Can result from anxiety or response to pain or fever, respiratory failure, shortness of breath, or a respiratory infection. May lead to respiratory alkalosis, paresthesia, tetany, and confusion

Results from sleep, respiratory depression, drug overdose, or central nervous system lesion

May be intermittent, such as in sleep apnea, or prolonged, as in a respiratory arrest

Tachypnea pattern associated with metabolic imbalance such as diabetic ketoacidosis, metabolic acidosis, or renal failure

BOX 38-7 NURSING STORY

My First Maternal-Child Clinical Experience

It was one of my first clinical experiences as a student nurse. I was placed on a maternity unit with seven other students. Because I was so nervous, I asked another student colleague to accompany me while I recorded vital signs on a newborn baby. I entered the room, introduced myself to the baby's mother, and grasped for the baby's wrist to check the heart rate. I had a hard time finding the pulse; it felt like hours before I finally felt what I hoped was the pulse. As I began counting each heartbeat, the responsible registered nurse entered the room and said, "Oh, are you trying to get the heart rate?" I was relieved that help had arrived. She advised me, "You need to use your stethoscope to listen to the apical pulse." I was so embarrassed, and even more nervous. I immediately put the stethoscope on the baby's chest. Confused, I told the student standing next to me, "I still can't hear anything." She smiled and pointed to the earpieces, which were sitting around my neck instead of in my ears.

patient's lifestyle could start with a commitment to exercise once a week for 20 minutes, or the patient could commit to a weight-reduction plan of 2 kg per month.

Remember that your goals and expectations may not always coincide with those of your patient. By addressing the patient's concerns and expectations, you will establish a relationship that can address other health care goals and expected outcomes. Knowing the mindset of patients and respecting their wishes will go a long way toward helping patients make significant lifestyle changes to benefit their health.

► BOX 38-8 Tuberculosis Skin Testing

- Skin testing is used to determine past exposure to *Mycobacterium tuberculosis*.
- Tuberculosis skin testing (TST) is performed by administering an intradermal injection of 0.1 mL of tuberculin-purified protein derivative on the inner surface of the forearm. The injection produces a pale elevation of the skin (a wheal) 6–10 mm in diameter. Afterward, the injection site may be circled, and the patient is instructed not to wash off the circle.
- Tuberculin skin tests are read 48–72 hours after injection. If the site is not read within 72 hours, the patient must undergo another skin test.
- Positive results are indicated by a palpable, elevated, hardened, reddened area around the injection site, caused by edema and inflammation from the antigen–antibody reaction. The site is measured in millimetres. A positive test result occurs when the site is ≥ 10 mm.
- Reddened flat areas are *not* positive reactions and are not measured.
- TST in older adults is less reliable (see Box 38-4).

❖ **Nursing Diagnosis**

Patients with an altered level of oxygenation can have nursing diagnoses that are primarily from a cardiovascular or pulmonary origin. Each nursing diagnosis is based on specific defining characteristics and the related etiology (Box 38-10). Use the information gathered in the nursing assessment to identify and

► **TABLE 38-6** Cardiopulmonary Diagnostic Blood Studies

Test and Normal Values	Interpretation
Complete Blood Count (CBC) Normal values for a CBC vary with age and gender.	A CBC determines the number and type of red and white blood cells per cubic millimetre of blood.
Cardiac Blood Studies CK (Creatinine Kinase) MB Levels rise 3–6 hours after infarction occurs. Peaks in 18 hours and then returns to normal within two days. Two cardiac specific troponins released after a myocardial infarction: Troponin T (cTnt) and Troponin I (cTnl). Cardiac troponin I <0.03 ng/mL Cardiac troponin T <0.2 ng/mL B-Type Natriuretic Peptide (BNP) BNP < 100 ng/L	Cardiac enzymes are used to diagnose acute myocardial infarcts. CK-MB is specific to the myocardial cell and may quantify myocardial damage and timing of the onset of the infarction. Cardiac troponins become elevated as early as three hours after myocardial injury. Often remains elevated for 7–10 days. Often remains elevated for up to 10–14 days. BNP is a marker for heart failure and assists with identifying pulmonary or cardiac causes for shortness of breath. The more elevated the levels, the more severe the heart failure.
Serum Electrolytes Potassium (K ⁺) 3.5–5 mmol/L	Patients on diuretic therapy are at risk for hypokalemia (low potassium). Patients receiving angiotensin-converting enzyme inhibitors are at risk for hyperkalemia (elevated potassium).
Cholesterol Cholesterol <5.20 mmol/L Low-density lipoprotein (LDL) cholesterol (bad cholesterol) <3.4 mmol/L High-density lipoprotein (HDL) cholesterol (good cholesterol) Male: >0.75 mmol/L Female: >0.91 mmol/L Triglycerides Male: 0.45–1.81 mmol/L Female: 0.40–1.52 mmol/L	Contributing factors include sedentary lifestyle, intake of saturated fatty acids, and familial hypercholesterolemia. High LDL cholesterol (hypercholesterolemia) is caused by excessive intake of saturated fatty acids, dietary cholesterol intake, and obesity. Familial hypercholesterolemia and hyperlipidemia are also contributing factors, as are hypothyroidism, nephrotic syndrome, and diabetes mellitus. Low HDL cholesterol is caused by cigarette smoking, obesity, lack of regular exercise, β -adrenergic blocking agents, genetic disorders of HDL metabolism, hypertriglyceridemia, and type 2 diabetes. Obesity, excessive alcohol intake, diabetes mellitus, β -adrenergic blocking agents, and genetic predisposition cause hypertriglyceridemia.

Data from Pagana, K. D., & Pagana, T. J. (2010). *Mosby's manual of diagnostic and laboratory tests* (4th ed.). St Louis, MO: Mosby.

► **TABLE 38-7** Cardiac Function Diagnostic Tests

Test	Significance
12-Lead electrocardiogram (ECG)	Graphic recording of the electrical activity of the heart, used to detect abnormal electrical activity and the electrical position of the heart. The ECG includes 12 leads: I, II, III, AVR, AVL, AVF, and V1–6. It provides a 360-degree view of the heart.
Holter monitor	Portable ECG worn by the patient. The test produces a continuous ECG tracing over a period of time. Patients keep a diary of activity, noting when they experience rapid heartbeats or dizziness. Evaluation of the ECG recording along with the diary provides information about the heart's electrical activity during activities of daily living.
ECG exercise stress test	ECG is monitored while the patient walks on a treadmill at a specified speed and duration of time. Used to evaluate the cardiac response to physical stress. The test is not a valuable tool for evaluation of cardiac response in women because of increased false-positive findings among women.
Thallium stress test	An ECG stress test with the addition of thallium-201-injected IV. The test determines coronary blood flow changes with increased activity.
Electrophysiological study (EPS)	Invasive measure of intracardiac electrical pathways. Provides more specific information about difficult-to-treat dysrhythmias. EPS assesses the adequacy of antidysrhythmic medication.
Echocardiography	Noninvasive measure of heart structure and heart wall motion. Graphically demonstrates overall cardiac performance.
Scintigraphy	Radionuclide angiography. Used to evaluate cardiac structure, myocardial perfusion, and contractility.
Cardiac catheterization and angiography	Used to visualize cardiac chambers, valves, the great vessels, and coronary arteries. Pressures and volumes within the four chambers of the heart can also be measured.

► BOX 38-9 Common Respiratory Tests and Methods

Oxygenation Tests

- **Pulse oximetry:** A **pulse oximeter** is a device used to measure pulse rate and oxygen concentration in arterial blood (SaO_2). A sensor is attached to the patient's finger, toe, nose, earlobe, or forehead. Accuracy is directly related to the perfusion of the probe area, a systolic blood pressure >90 mm Hg, and the hemoglobin level. Decreased levels correlate well with arterial oxygen levels and are used to trend oxygenation over time. Normal SaO_2 values are 98%–100%. An SaO_2 below 70% is life-threatening.
- **Arterial blood gas:** A radial or femoral artery is punctured to obtain arterial blood. Tests measure the oxygen concentration in the blood, the hydrogen ion concentration (pH), partial pressure of carbon dioxide (PaCO_2), and the partial pressure of oxygen (PaO_2). Normal values are as follows:
 - pH 7.35–7.45
 - PaCO_2 35–45 mm Hg
 - PaO_2 80–100 mm Hg
 - SaO_2 95%–100%

Pulmonary Function Tests

Pulmonary function tests measure lung volume (the amount of air moving into and out of the lungs) and capacity (how much air the lungs can hold). Respiratory therapists usually conduct these tests. The patient takes as deep a breath as possible and forcefully exhales into a mouthpiece attached to a machine. Pulmonary readings are recorded and compared with previous readings and with average normal values, which vary depending on the patient's age, gender, weight, height, and race. These tests are used to diagnose and monitor pulmonary disease and conditions (e.g., asthma, emphysema). They are also used to evaluate postoperative lung conditions.

Imaging

- **Chest X-ray examination:** Usually posteroanterior and lateral films are taken to adequately visualize all of the lung fields. A radiograph of the thorax is used to observe the lung fields for fluid, infiltrates (e.g., pneumonia), masses (e.g., lung cancer), fractures, pneumothorax, and other abnormal processes.
- **Computed tomography (CT) scan:** A CT scan provides visualization of fine detail of the lungs and other structures in the thorax. It is often used as part of the assessment of patients with pneumonia, lung masses, and suspected pulmonary emboli.
- **Ventilation/perfusion (nuclear medicine) lung scan:** This scan is used to detect pulmonary emboli. The results from two separate

scans are compared: the perfusion scan uses an injected radioactive tracer to measure pulmonary blood flow, and the ventilation scan shows the pulmonary distribution of a different inhaled tracer. Mismatches (areas of ventilation without corresponding perfusion or blood flow) indicate pulmonary emboli.

Methods of Obtaining Respiratory Specimens for Analysis

Specimens are cultured so they can be used to detect the presence of blood, microbes, and abnormal cells. A variety of methods are used to obtain respiratory specimens.

- **Sputum tests:** Sputum is mucus from the respiratory system that is expectorated through the mouth. Sputum specimens are obtained when the patient coughs up sputum from the bronchi and trachea; specimens are easier to obtain in the morning when the secretions are coughed up upon awakening. Sputum tests include (a) *sputum culture and sensitivity (C and S)* test, used to identify a specific microorganism growing in the sputum and to identify drug resistance and sensitivities; (b) *sputum for acid-fast bacillus (AFB)*, a test used to screen for the presence of AFB for detection of TB by early-morning specimens on three consecutive days; and (c) *sputum for cytology*, used to identify abnormal lung cancer and differentiates the type of cancer cells (small cell, oat cell, large cell).
- **Tracheal aspiration via endotracheal tube in intubated patients:** Secretions are collected by passing a flexible suction catheter through the endotracheal tube.
- **Bronchoscopy:** A narrow, flexible, fiberoptic scope is passed into the trachea and bronchi to enable visual examination of the tracheobronchial tree. The procedure is performed to obtain fluid, sputum, or biopsy samples, and to remove mucous plugs or foreign bodies.
- **Thoracentesis:** This involves surgical perforation of the chest wall and pleural space with a needle to aspirate fluid for diagnostic or therapeutic purposes or to remove a specimen for biopsy. The procedure is performed using aseptic technique and local anaesthetic. The patient usually sits upright with the anterior thorax supported by pillows or an overbed table.
- **Nasopharyngeal aspirate or swab:** This swab is used to detect respiratory viruses. Aspirates are the best specimens from young children, whereas swabs can be used for obtaining samples from older children and adults.

cluster the defining characteristics. The clustered defining characteristics support the nursing diagnosis.

Nursing diagnoses appropriate for the patient with alterations in oxygenation include, but are not limited to, the following:

- Activity intolerance
- Risk for activity intolerance
- Ineffective airway clearance
- Anxiety
- Ineffective breathing pattern
- Decreased cardiac output
- Impaired comfort
- Impaired verbal communication
- Ineffective individual coping
- Fatigue
- Fear

- Risk for imbalanced fluid volume
- Impaired gas exchange
- Ineffective health maintenance
- Risk for infection
- Deficient (specify) knowledge
- Risk for impaired skin integrity
- Disturbed sleep pattern
- Ineffective tissue perfusion
- Impaired spontaneous ventilation

❖ Planning

During planning, use critical thinking skills to synthesize information from multiple sources (Figure 38-7). Critical thinking ensures that your plan of care integrates individualized patient needs. Professional standards are especially important

BOX 38-10 NURSING DIAGNOSTIC PROCESS

Assessment Activities	Defining Characteristics	Nursing Diagnosis
Ask patient or family about patient's mood, attentiveness, memory, and activity level.	Confusion Decreased activity Fatigue Irritability Restlessness Sleepiness	<i>Impaired gas exchange related to decreased lung expansion</i>
Observe patient's respirations.	Dyspnea Impaired gas exchange related to collapsed alveoli Nasal flaring Tachypnea Use of accessory muscles	
Inspect skin and mucous membranes.	Diaphoresis Pallor Moist skin	
Auscultate chest.	Decreased respiratory excursion Abnormal, distant lung sounds	

to consider when developing a care plan. These standards often establish scientifically proven guidelines for selecting effective nursing interventions.

Goals and Outcomes

Develop an individualized care plan for each nursing diagnosis (Box 38-11). In collaboration with your patient, set realistic expectations for care. Goals should be individualized and realistic with measurable outcomes.

Patients with impaired oxygenation require a nursing care plan directed toward meeting the actual or potential oxygenation needs of the patient. Individual outcomes are derived from patient-centred needs. For example, the goal of maintaining a patent airway can be evaluated by specific outcomes for the patient. These might include the following expected outcomes:

- Patient's lungs are clear to auscultation.
- Patient achieves maintenance and promotion of bilateral lung expansion.
- Patient coughs productively.
- Tissue oxygenation (SaO_2) is maintained or improved.

Often a patient with cardiopulmonary disease has multiple nursing diagnoses (Figure 38-8). In this case, identify when goals or outcomes apply to more than one diagnosis. The presence of multiple diagnoses also makes priority setting a critical activity.

Setting Priorities

The patient's level of health, age, lifestyle, and environmental risks affect the level of tissue oxygenation. Patients with severe impairments in oxygenation frequently require nursing interventions in multiple areas. Consider what the most important goal is during the limited amount of time the patient is seen

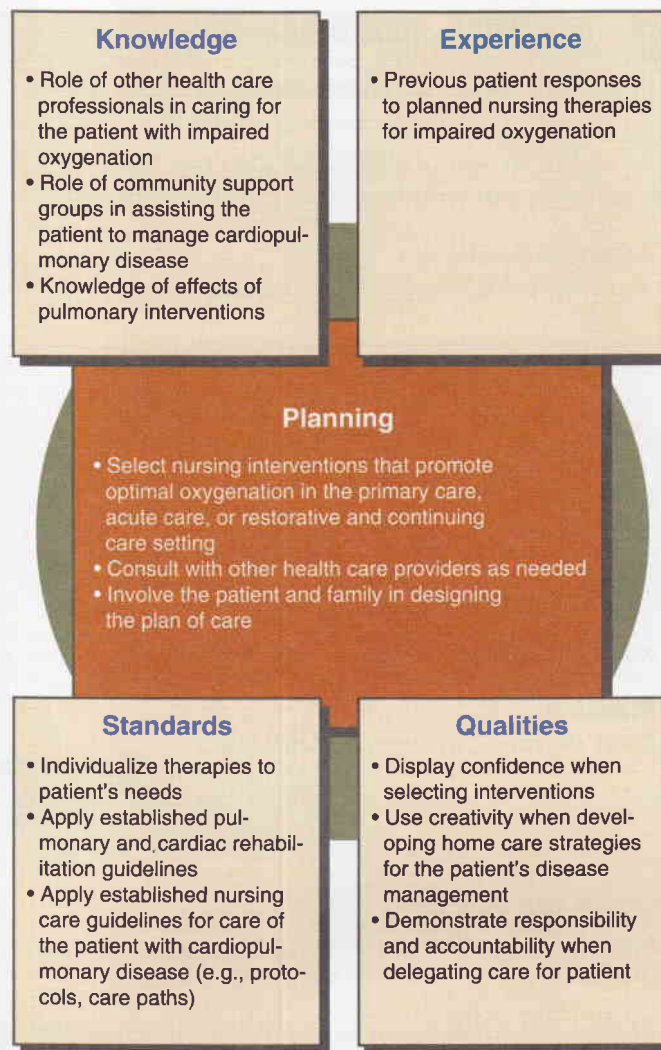


Figure 38-7 Critical thinking model for oxygenation planning.

in the hospital or primary care setting. For example, in an acute care setting, maintaining a patent airway has a higher priority than improving the patient's exercise tolerance. The need for a patent airway is an immediate need. In a second example, when caring for a patient who has an abdominal incision, pain control may have a greater priority than coughing and deep breathing. Again, in this situation, controlling the patient's pain ultimately will facilitate coughing and deep breathing.

However, in a community-based or primary setting, the priority may focus on smoking cessation, exercise, diet modifications, or a combination of these activities. Both you and the patient need to be focused on the same goal and expected outcomes to be successful. In addition to being individualized, each goal should be realistic and attainable for the patient.

Collaborative Care

The time spent with the patient in any setting is limited. Therefore, collaborate with family members, colleagues, and other specialists to accomplish the goals and outcomes that have been determined. Some patients may need to improve their exercise and activity tolerance; for some patients, their continuity of care may involve enrolling in a community-based cardiopulmonary rehabilitation program. Another patient may

► BOX 38-11 NURSING CARE PLAN

Ineffective Airway Clearance/Retained Secretions

Assessment

Mr. Edwards, an older adult with a history of COPD, comes to the primary care office with complaints of continued coughing. He continues to smoke two to three cigarettes a day, an improvement from his previous 10 to 15 per day.

Assessment Activities

Ask Mr. Edwards how long he has had this cough.

Ask Mr. Edwards what is different about this cough.

Observe Mr. Edwards's skin and mucous membranes.

Auscultate lung fields.

Ask Mr. Edwards how many glasses of water he drinks daily.

Ask Mr. Edwards to produce a sputum sample.

Findings and Defining Characteristics

He replies, "I have a morning cough every day, but this cough is different. It started about a week ago."

He replies, "My ribs are getting sore. I can't cough up anything, my mouth is dry, and I have become more fatigued over the past week."

His skin and mucous membranes are dry.

Abnormal lung sounds in the upper lobes. The lower lobes are clear.

Over the last week he has drunk two to three glasses a day.

He is unable to produce a sputum sample for evaluation.

Nursing Diagnosis: Ineffective airway clearance related to retained secretions and reduced fluid intake.

Planning

Goals (Nursing Outcomes Classification)*

Patient will be able to effectively clear secretions.

Patient will increase oral hydration to 1000 mL of water every 24 hours.

Expected Outcomes

Respiratory Status: Airway Patency

Lung sounds will be normal in 48 hours.

Sputum will be thin, white, and watery.

Respiratory rate will be within 20–24 breaths/minute in 48 hours.

Patient will be able to clear airway by coughing.

Oral mucous membranes will be pink and moist.

Patient will verbalize that his mouth is not dry.

Patient will notice an increase in ease of sputum production.

Patient will report that his sputum is thin, white, and watery.

*Outcome classification labels from Moorhead, S., Johnson, M., Maas, M. L., & Swanson, E. (Eds.). (2008). *Nursing outcomes classification (NOC)* (4th ed.). St Louis, MO: Mosby.

Interventions (Nursing Interventions Classification)[†]

Airway Management

Increase fluids to 1000 mL in 24 hours if not contraindicated by cardiovascular disease (Lewis et al., 2000).

Have patient deep-breathe and cough every two hours four to five times (Lewis et al., 2000).

Teach patient effective cough techniques.

Consider chest physiotherapy (CPT) if there is evidence of infiltrates on chest X-ray film.

Rationale

Fluids help to liquefy secretions and promote ease of removal (Snow et al., 2001). Fluids will relieve oral mucosa and skin dryness.

Retained secretions predispose patient to atelectasis and pneumonia (Day et al., 2002).

Coughing techniques will help to clear the airway effectively and decrease fatigue from ineffective coughing (Snow et al., 2001).

Standards for CPT include sputum production >30 mL/day or infiltrates on chest X-ray film.

[†]Intervention classification labels from Bulechek, G. M., Butcher, H. K., & Dochterman, J. M. (Eds.). (2008). *Nursing interventions classification (NIC)* (5th ed.). St Louis, MO: Mosby.

Evaluation

Nursing Actions

Ask Mr. Edwards if he can deep-breathe and cough.

Assess the chest for adventitious lung sounds.

Patient Response and Findings

Mr. Edwards reports, "It is easier to cough up my secretions now."

Mr. Edwards reports that he has not heard any wheezing or rattling in his chest.

Achievement of Outcome

Patient is able to clear airway by coughing.

Lungs clear to auscultation in all fields.

BOX 38-11 NURSING CARE PLAN—cont'd

Nursing Actions	Patient Response and Findings	Achievement of Outcome
Assess respiratory rate.	No use of accessory muscles of respiration. Normal breathing pattern and respiratory rate.	Respiratory rate is between 20 and 24 breaths/minute.
Assess patient's level of hydration.	Mucous membranes are moist. Mr. Edwards reports, "My mouth isn't so dry anymore."	Oral mucous membranes are pink and moist.
Observe appearance of sputum.	Sputum is thin, white, and watery.	Sputum is thin, white, and watery.

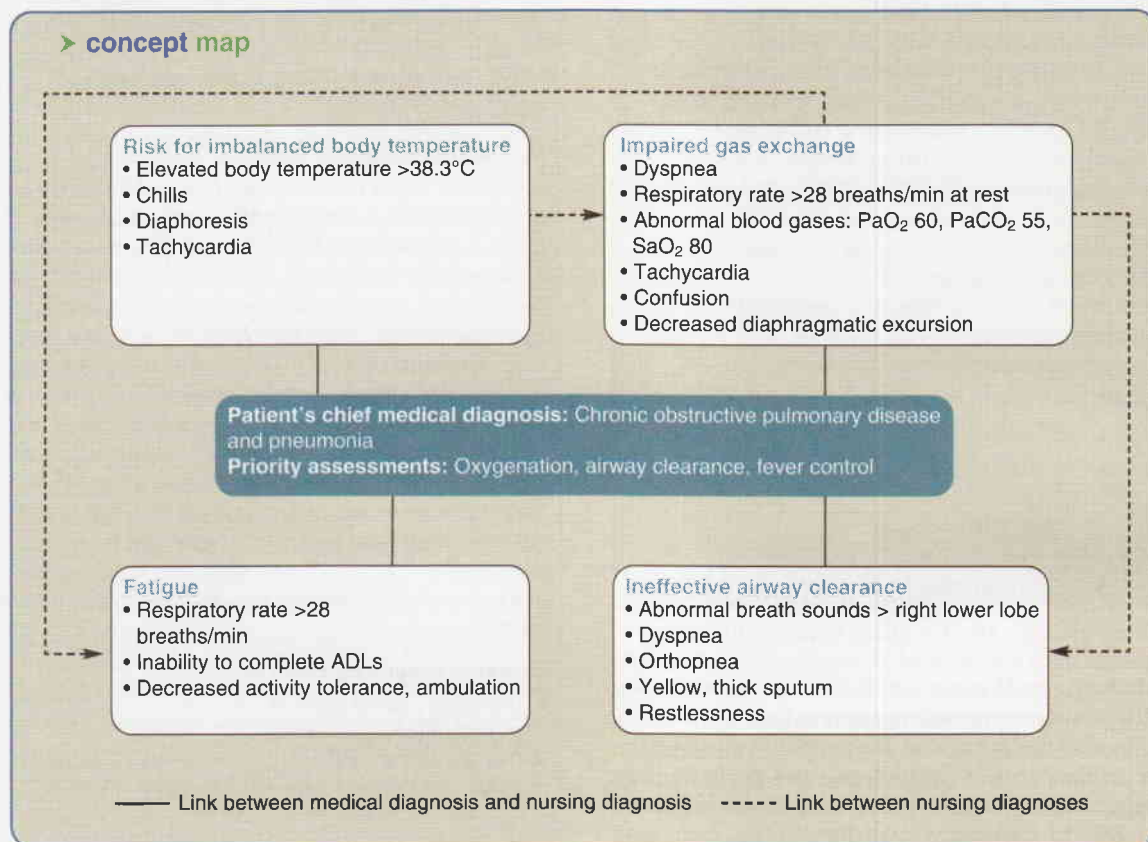


Figure 38-8 Concept map for a patient with chronic obstructive pulmonary disease and pneumonia. ADLs, Activities of daily living.

have the same health care need but is unable to leave the home, and home physiotherapy is needed.

Collaboration with physiotherapists, nutritionists, and community-based nurses may be valuable for a patient with congestive heart failure or chronic lung conditions and is an essential component of primary health care. These professionals work with the patient and the community to optimize resources to assist the patient in attaining the highest level of wellness. In addition, professionals can help to identify community resources and support systems for both the patient and family in preventing and managing symptoms related to cardiopulmonary diseases.

❖ Implementation

Nursing interventions for promoting and maintaining adequate oxygenation include independent nursing actions such

as health-promotion and disease-prevention behaviours, positioning, and coughing techniques. Interdependent or dependent interventions include oxygen therapy, lung inflation techniques, hydration, medication administration, and chest physiotherapy (CPT).

Health Promotion

Maintaining the patient's optimal level of health is important in reducing the number and severity of respiratory symptoms. Prevention of respiratory infections is foremost in maintaining optimal health. Providing cardiopulmonary-related health information (Box 38-12 and Box 38-13) is an important nursing responsibility and part of a primary health care model.

Vaccinations. Annual influenza vaccines are recommended for children 6 to 23 months of age, older patients, and patients with chronic illnesses. This includes patients older than 65 years of age; patients of any age with chronic disease

* BOX 38-12 PATIENT TEACHING

Cardiovascular Disease

Objectives

- Patient will be able to describe the risk factors associated with cardiovascular disease.
- Patient will be able to demonstrate health promotion behaviours.

Teaching Strategies

- Explain to the patient about modifying risk factors, such as quitting smoking, reducing alcohol intake, and modifying high-fat and high-carbohydrate diets.
- Inform the patient about other risk factors for cardiovascular disease, such as diabetes, obesity, physical inactivity, stress, and oral contraceptives.
- Discuss with the patient the importance of regular blood pressure and blood cholesterol monitoring (total cholesterol, high-density lipoprotein, low-density lipoprotein, and triglyceride levels).
- Educate the patient about low-fat, low-salt, and calorie-appropriate diets. Provide sample menus.
- Educate the patient about the benefits of exercising for 30–60 minutes a day to help reduce weight and lower blood pressure. Help the patient develop an exercise program.

Evaluation

- Ask the patient to describe the modifiable and nonmodifiable risk factors for cardiovascular disease.
- Ask the patient to verbalize strategies for balanced nutrition.
- Obtain patient's weight and blood pressure.
- Monitor the patient's serum cholesterol (total, high- and low-density lipids) and triglyceride levels.



of the heart, lung, or kidneys; patients with diabetes; and patients with immunosuppression or severe forms of anemia. The vaccine is also recommended for people in close or frequent contact with anyone in the high-risk groups. In Canada, flu season occurs from November to April, and it is estimated that 10% to 25% of Canadians may get the flu each year. Although most individuals recover completely, an estimated 4000 to 8000 Canadians, mostly older adults, die every year from pneumonia related to the flu. Many others may die from other serious complications of the flu. After the vaccination, antibodies develop against the strains of the virus. When exposed to the influenza virus, the antibodies assist with preventing infection or reduce the severity of illness (Health Canada, 2009).

The value of vaccination of immunocompromised patients is not completely understood. HIV-positive patients may receive the flu vaccine; however, they may require a second vaccine to gain protection. People who should not be vaccinated include those with a known hypersensitivity to eggs or other components of the vaccine and adults with an acute febrile illness. The vaccines are formulated annually on the basis of worldwide surveillance data.

Pneumococcal vaccine is recommended for patients at increased risk of developing pneumonia, those with chronic illnesses or immunosuppression (such as HIV/AIDS), those living in special environments such as long-term care facilities, and patients over the age of 65 years (Centres for Disease Control and Prevention [CDC], 2010).

* BOX 38-13 RESEARCH HIGHLIGHT

Ethnic and Gender Differences in Patient Education About Heart Disease Risk and Prevention

Research Focus

Immigrants have lower rates of heart disease than the Canadian-born population after adjustment for differences in age, education, and income (Grunau et al., 2009, p. 181). The purpose of the study conducted by Grunau et al. (2009) was to understand whether gender and ethnic differences affect patient education about heart disease risk and prevention by health care providers. This study was part of a larger study that considered the relationship between sociodemographic, clinical, cognitive, psychological, social factors, and delay in treatment seeking for cardiac symptoms.

Research Abstract

A telephone survey was completed by a random sample of 976 men and women living in Metro Vancouver, British Columbia. The participants were categorized by their immigration status—those born in Canada and those that were not. The immigrant group was further divided based on two aspects: ethnicity—identity and language. The age of participants ranged from 40 to 89 years, with a mean of 55.5 years. The questionnaire was administered in four languages (English, Punjabi, Mandarin, and Cantonese) and assessed perceived communication with health care providers about heart disease risk and management education. Significant gender and ethnic differences were identified in health care providers' communication. Women were less likely than men to have had discussions regarding the management and their risk of heart disease with health care providers. In addition, Canadian-Chinese participants were less likely than other ethnic groups to receive information from their health care providers about heart disease.

Evidence-Informed Practice

- Emphasize heart disease education and its risk factors for women and postmenopausal women.
- Comprehend the seriousness of heart disease in women in order for women to understand the importance of primary and secondary prevention.
- The Canadian-Chinese population is not receiving patient education similar to that received by other communities; thus, it is important to understand the barriers faced by ethnic groups to develop solutions.

Reference: Grunau, G. L., Ratner, P. A., Galdas, P. M., & Hossain, S. (2009). Ethnic and gender differences in patient education about heart disease risk and prevention. *Patient Education and Counseling*, 76, 181–188. doi:10.1016/j.pec.2008.12.026.



Both the influenza vaccine and pneumococcal vaccine can be administered to pregnant women after the first trimester. However, in all cases, it is important to consult the patient's obstetrician before administering either vaccine.

Healthy Lifestyle Behaviour. Identification and elimination of risk factors for cardiopulmonary disease is an important part of primary health care. Encourage patients to eat a healthy, low-fat, high-fibre diet; monitor their cholesterol, triglyceride, high-density lipoprotein (HDL), and low-density lipoprotein (LDL) levels; reduce stress; exercise; and maintain a body weight in proportion to their height.

Elimination of cigarettes and other tobacco products, reduction of pollutants, monitoring of air quality, and adequate

hydration are additional healthy behaviours. Patients should be encouraged to examine their habits and make changes to achieve their goals.

Exercise is a key factor in promoting and maintaining a healthy heart and lungs. Patients should be encouraged to exercise 3 to 4 times a week for 20 to 30 minutes. Aerobic exercise is necessary to improve lung function, strengthen muscles, and achieve the desired outcome. Walking is one of the most efficient ways to achieve a good aerobic workout. Many shopping malls have programs that allow people to enter the mall before the shops open and use the enclosed area for walking. Some even have measured the distances to help people plan their activity and measure their progress. Patients should be taught how to take their pulse and pace themselves. It is better to walk 15 minutes every day than to walk to exhaustion to achieve a goal. Patients should plan a time interval and walk for the designated time. Gradually, they will notice that the distance increases as their endurance and fitness improve.

Patients with cardiopulmonary alterations need to minimize their risk for infection, especially during the winter months. Teach patients to avoid large, crowded places; to keep their mouth and nose covered; and to be sure to dress warmly, including a scarf, hat, and gloves. This is especially important during the peak of the influenza season.

Patients with known cardiac disease and those with multiple risk factors should be cautioned to avoid exertion in cold weather. Shovelling snow is especially risky and has been known to precipitate a cardiac event in many patients. Other activities such as hanging holiday lights and decorations in the extreme cold can precipitate chest pain and bronchospasm. Advise patients to avoid alcohol, because it blunts the respiratory drive when used in excess and may contribute to exposure to the cold by making the patient feel warm when the patient is really not protected.

Patients should also be taught to plan for the hot summer months. Activities should be limited to early in the day or late in the evening, when temperatures are lower. Patients should take care to maintain adequate hydration and sodium intake; this is especially true for those patients taking diuretics. Caffeinated and alcoholic beverages should be limited or avoided completely, because they act as diuretics and can contribute to dehydration.

Environmental Pollutants. Avoiding exposure to second-hand smoke is essential to maintaining optimal cardiopulmonary function. Most businesses and restaurants now ban smoking or have separate areas designated as smoking areas. If patients are exposed to second-hand smoke in their home environments, counselling and support may be necessary to assist the smoker in successful smoking cessation or alterations in behaviour patterns, such as smoking outside.

Exposure to chemicals and pollutants in the work environment must also be considered. Patients such as farmers, painters, carpenters, and others benefit from the use of particulate filter masks to reduce inhalation of particles.

Acute Care

Patients with acute pulmonary illnesses require nursing interventions directed toward halting the pathological process (e.g., respiratory tract infection), shortening the duration and severity of the illness (e.g., hospitalization with pneumonia), and preventing complications from the illness or treatments (e.g., nosocomial infection resulting from invasive procedures).

Dyspnea Management. Dyspnea is difficult to quantify and to treat. Treatment modalities need to be individualized for each patient, and more than one therapy is usually implemented. The underlying process that causes or worsens dyspnea must be treated and stabilized initially, then four additional therapies—pharmacological measures, oxygen therapy, physical techniques, and psychosocial techniques—are implemented. Pharmacological agents may include bronchodilators, steroids, mucolytics, and low-dose anti-anxiety medications. Oxygen therapy can reduce dyspnea associated with exercise. Physical techniques, such as cardiopulmonary reconditioning through exercise, breathing techniques, and cough control, can help to reduce dyspnea. Relaxation techniques, biofeedback, and meditation are physiological measures that the patient can use to help lessen the sensation of dyspnea.

Airway Maintenance. The airway is patent when the trachea, bronchi, and large airways are free from obstructions. Airway maintenance requires adequate hydration to prevent thick, tenacious secretions. Proper coughing techniques remove secretions and keep the airway open. A variety of interventions, such as suctioning, chest physiotherapy, and nebulizer therapy, assist the patient in managing alterations in airway clearance.

Mobilization of Pulmonary Secretions. The ability of a patient to mobilize pulmonary secretions may make the difference between a short-term illness and a long recovery involving complications. Nursing interventions that promote mobilization of pulmonary secretions help the patient to achieve and maintain a clear airway, and encourage lung expansion and gas exchange.

Humidification. Humidification is the process of adding water to gas. Temperature is the most important factor affecting the amount of water vapour a gas can hold. The percentage of water in the gas in relation to its capacity for water is the relative humidity. Air or oxygen with a high relative humidity keeps the airways moist and helps loosen and mobilize pulmonary secretions. Humidification is necessary for patients receiving oxygen therapy at >4 L/minute. Bubbling oxygen through water can add humidity to the oxygen delivered to the upper airways, as with a nasal cannula or face mask.

An oxygen hood is used for infants and a humidity tent is used for children with illnesses such as croup and tracheitis to liquefy secretions and assist in the reduction of fever (Hockenberry & Wilson, 2007). To prevent nonhumidified air or oxygen from entering the tent, the nebulizer at the top of the humidity tent remains filled with water. Air in the humidity tent can become cool and may fall below 20°C , thus causing the child to become chilled. Children in humidity tents require frequent changes of clothing and bed linen to remain dry and warm.

Nebulization. Nebulization is a process of adding moisture or medications to inspired air by mixing particles of varying sizes with the air. A nebulizer uses the aerosol principle to suspend a maximum number of water drops or particles of the desired size in inspired air. The moisture added to the respiratory system through nebulization improves clearance of pulmonary secretions. Nebulization is often used for administration of bronchodilators and mucolytic agents.

When the thin layer of fluid that supports the mucous layer over the cilia is allowed to dry, the cilia are damaged and cannot adequately clear the airway. Humidification through nebulization enhances mucociliary clearance, the body's natural mechanism for removing mucus and cellular debris from the respiratory tract.

► BOX 38-14

Guidelines for Chest Physiotherapy

Nursing care and selection of chest physiotherapy (CPT) skills are based on specific assessment findings. The following guidelines are designed to help in physical assessment and subsequent decision making:

- Know the patient's normal range of vital signs. Conditions such as atelectasis and pneumonia requiring CPT can affect vital signs. The degree of change is related to the level of hypoxia, overall cardiopulmonary status, and tolerance to activity.
- Know the patient's medications. Certain medications, particularly diuretics and antihypertensives, cause fluid and hemodynamic changes. These changes may decrease the patient's tolerance to the positional changes of postural drainage. Steroid medications increase the patient's risk of pathological rib fractures and often contraindicate rib shaking.
- Know the patient's medical history. Certain conditions such as increased intracranial pressure, spinal cord injuries, and abdominal aneurysm resection contraindicate the positional changes of postural drainage. Thoracic trauma or surgery may also contraindicate percussion, vibration, and rib shaking.
- Know the patient's level of cognitive function. Participation in controlled coughing techniques requires the patient to follow instructions. Congenital or acquired cognitive limitations may alter the patient's ability to learn and participate in these techniques.
- Be aware of the patient's exercise tolerance. CPT manoeuvres are fatiguing. When the patient is not used to physical activity, initial tolerance for the manoeuvres may be decreased. However, with gradual increases in activity and planned CPT, patient tolerance for the procedure will improve.

Chest Physiotherapy. Chest physiotherapy (CPT) is a group of therapies used in combination to mobilize pulmonary secretions. These therapies include postural drainage, chest percussion, and vibration. CPT should be followed by productive coughing and suctioning of the patient who has a decreased ability to cough. CPT is recommended for patients who produce greater than 30 mL of sputum per day or have evidence of atelectasis by chest X-ray examination. This procedure can be safely used with infants and young children; however, conditions and diseases unique to children may at times contraindicate this procedure. CPT is used for a select group of patients. Box 38-14 describes the guidelines for determining if CPT is indicated for the patient.

Chest percussion involves striking the chest wall over the area being drained. The hand is positioned so that the fingers and thumb touch and the hands are cupped (Figure 38-9). Percussion on the surface of the chest wall sends waves of varying amplitude and frequency through the chest, changing the consistency and location of the sputum. Chest percussion is performed by striking the chest wall alternately with cupped hands (Figure 38-10). Percussion is performed over a single layer of clothing, not over buttons, snaps, or zippers. The single layer of clothing prevents slapping the patient's skin. Thicker or multiple layers of material dampen the vibrations.

Percussion is contraindicated in patients with bleeding disorders, osteoporosis, or fractured ribs. It is important to percuss the lung fields and not the scapular regions, or trauma may occur to the skin and underlying musculoskeletal structures.



Figure 38-9 Hand position for chest wall percussion during chest physiotherapy.



Figure 38-10 Chest wall percussion, alternating hand clapping against the patient's chest wall.

Vibration is a fine, shaking pressure applied to the chest wall only during exhalation. This technique is thought to increase the velocity and turbulence of exhaled air, facilitating secretion removal. Vibration increases the exhalation of trapped air and may shake mucus loose and induce a cough.

Postural drainage is the use of positioning techniques that draw secretions from specific segments of the lungs and bronchi into the trachea. Coughing or suctioning normally removes secretions from the trachea. The procedure for postural drainage can include most lung segments (Table 38-8). Because patients may not require postural drainage of all lung segments, the procedure is based on clinical assessment findings. For example, patients with left lower lobe atelectasis may require postural drainage of only the affected region, whereas a child with cystic fibrosis may require postural drainage of all lung segments.

Suctioning Techniques. Suctioning is necessary when a patient is unable to clear respiratory tract secretions with coughing. The suctioning techniques include oropharyngeal and nasopharyngeal suctioning, orotracheal and nasotracheal suctioning, and suctioning of an artificial airway.

These techniques are based on common principles. In most cases, use sterile technique for suctioning because the trachea

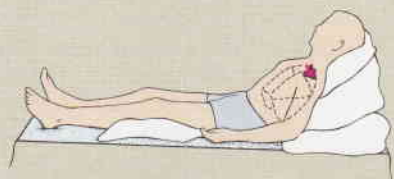
▶ TABLE 38-8 Positions for Postural Drainage

Lung Segment**Adult**

Bilateral

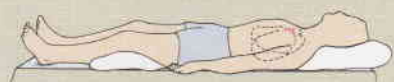
Position of Patient

High-Fowler's position

**Apical segments**

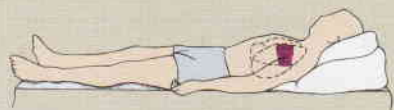
Right upper lobe—anterior segment

Supine with head of bed elevated 15–30 degrees



Left upper lobe—anterior segment

Supine with head elevated



Right upper lobe—posterior segment

Side lying with right side of chest elevated on pillows



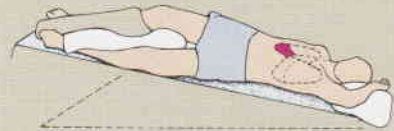
Left upper lobe—posterior segment

Side lying with left side of chest elevated on pillows



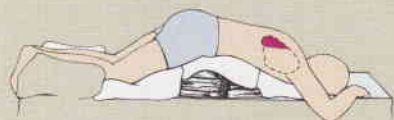
Right middle lobe—anterior segment

Three-fourths supine position with dependent lung in Trendelenburg's position



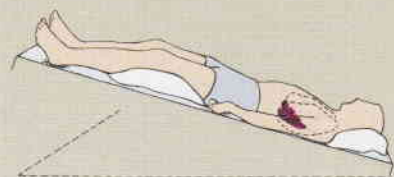
Right middle lobe—posterior segment

Prone with thorax and abdomen elevated



Both lower lobes—anterior segments

Supine in Trendelenburg's position

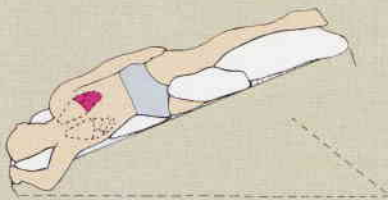


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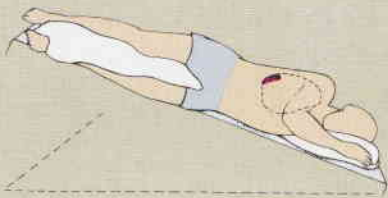
► **TABLE 38-8** Positions for Postural Drainage—cont'd

Lung Segment

Left lower lobe—lateral segment



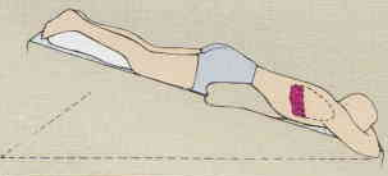
Right lower lobe—lateral segment



Right lower lobe—posterior segment



Both lower lobes—posterior segments



Position of Patient

Right side lying in Trendelenburg's position

Left lateral in Trendelenburg's position

Prone in Trendelenburg's position with abdomen and thorax elevated

Prone in Trendelenburg's position with abdomen and thorax elevated

Child

Bilateral—apical segments



Sitting on nurse's lap, leaning slightly forward, flexed over pillow

Bilateral—middle anterior segments



Sitting on nurse's lap, leaning against nurse

Bilateral lobes—anterior segments



Lying supine on nurse's lap, back supported with pillow

is considered sterile. The mouth is considered clean, thus the suctioning of oral secretions should be performed after suctioning of the oropharynx and trachea. Each type of suctioning requires the use of a round-tipped catheter with a number of side holes at the distal end of the catheter. Frequency of suctioning is determined by patient assessment and need. If secretions are identified by inspection or auscultation techniques, suctioning is required. Because sputum is not produced continuously or every one or two hours but occurs as a response to a pathological condition, there is no rationale for routine suctioning of all patients every one to two hours. In addition, suctioning reduces the amount of the available dead space in the oropharynx and trachea, often resulting in significant desaturation. Be careful to monitor the patient to ensure

adequate oxygenation. Too-frequent suctioning can put the patient at risk for development of hypoxemia, hypotension, arrhythmias, and possible trauma to the mucosa of the lungs (Day et al., 2002).

Oropharyngeal and Nasopharyngeal Suctioning. The oropharynx extends behind the mouth from the soft palate above the level of the hyoid bone and contains the tonsils. The nasopharynx is located behind the nose and extends to the level of the soft palate. Oropharyngeal or nasopharyngeal suctioning is used when the patient is able to cough effectively but is unable to clear secretions by expectorating or swallowing. The suction procedure is used after the patient has coughed (Skill 38-1). As the amount of pulmonary secretions is reduced

Text continued on p. 912

► SKILL 38-1 Suctioning

video

Delegation Considerations

This skill may be delegated to nursing assistive personnel (NAP) in special situations. When you determine that the patient is stable, the skill of performing suctioning of an established tracheostomy can be delegated to a NAP when the patient has a permanent tracheostomy tube or is receiving home mechanical ventilation. Before delegating this skill, you must do the following:

- Discuss with the care provider any unique modifications of the skill, such as the need to reapply any supplemental oxygen equipment following the procedure.
- Appropriate suction limits.
- Instruct the NAP to report any change in the patient's respiratory status, signs and symptoms of hypoxemia, secretion colour or volume, or unresolved coughing or gagging.
- Instruct the NAP to report any change in patient's colour, vital signs, or pain level.

Equipment

- Appropriate-size suction catheter (smallest diameter that will remove secretions effectively) or Yankauer catheter (oral suction)
- Nasal or oral airway (if indicated)
- Two sterile gloves or one sterile and one clean disposable glove (refer to technique)
- Clean towel or paper drape
- Portable or wall suction
- Mask, goggles, or face shield
- Connecting tube (1.8 metres)
- Pulse oximeter and stethoscope

Equipment for Procedure Without Closed-Suction Catheter

- Small Y adapter (if catheter does not have a suction-control port)
- Water-soluble lubricant
- Sterile basin
- Sterile normal saline solution or water (approximately 100 mL)

Procedure

STEPS

1. Assess for signs and symptoms of upper and lower airway obstruction requiring nasotracheal or orotracheal suctioning, abnormal respiratory rate, adventitious sounds, nasal secretions, gurgling, drooling, restlessness, gastric secretions, or vomitus in mouth, and coughing without clearing secretions from airway.
2. Assess signs and symptoms associated with hypoxia and hypercapnia: decreased SpO₂, increased pulse and blood pressure, increased respiratory rate, apprehension, anxiety, decreased ability to concentrate, lethargy, decreased level of consciousness (especially acute), increased fatigue, dizziness, behavioural changes (especially irritability), dysrhythmias, pallor, and cyanosis.
3. Determine factors that normally influence upper or lower airway functioning:
 - Fluid status
 - Lack of humidity
 - Pulmonary disease, chronic obstructive pulmonary disorder, pulmonary infection

RATIONALE

- Physical signs and symptoms result from decreased oxygen to tissues, as well as pooling of secretions in upper and lower airways. Complete assessment before and after suction procedure (American Association of Respiratory Care [AARC], 2004; Demir & Dramali, 2005).
- Physical signs and symptoms resulting from decreased oxygen to tissues indicate need for suctioning. Anxiety and pain consume oxygen and, in turn, worsen the signs of hypoxia (Considine, 2005).
- Fluid overload may increase amount of secretions. Dehydration promotes thicker secretions.
- The environment influences secretion formation and gas exchange, necessitating airway suctioning when the patient cannot clear secretions effectively.
- Increases patient's risk for retaining pulmonary secretions. Patients with respiratory infections are prone to increased secretions that are thicker and sometimes more difficult to expectorate.

Continued

► SKILL 38-1 Suctioning—cont'd



- Anatomy
 - Changes in level of consciousness
 - Decreased cough or gag reflex
 - Allergies, sinus drainage
4. Identify contraindications to nasotracheal suctioning: occluded nasal passages; nasal bleeding, epiglottitis, or croup; acute head, facial, or neck injury or surgery, coagulopathy, or bleeding disorder; irritable airway or laryngospasm or bronchospasm; gastric surgery with high anastomosis; myocardial infarction (AARC, 2004).
 5. Examine sputum microbiology data.
 6. Assess patient's understanding of the procedure.
 7. Obtain physician's order if indicated by agency policy.
 8. Explain to patient how the procedure will help clear the airway and relieve breathing problems and that temporary coughing, sneezing, gagging, or shortness of breath is normal. Encourage patient to cough out secretions. Have patient practise coughing, if able. Splint surgical incisions, if necessary.
 9. Explain the importance of coughing and encourage coughing during procedure.
 10. Help patient to assume a position comfortable for you and the patient (usually semi-Fowler's or sitting upright with head hyperextended, unless contraindicated).
 11. Place pulse oximeter on patient's finger. Take reading and leave pulse oximeter in place.
 12. Place towel across patient's chest.
 13. Perform hand hygiene. Apply mask, goggles, or face shield if splashing is likely.
 14. Connect one end of connecting tubing to suction machine and place the other end in a convenient location near patient. Turn suction device on and set vacuum regulator to appropriate negative pressure: preterm infants 60–80 mm Hg, infants 80–100 mm Hg, children 100–120 mm Hg, adults 100–150 mm Hg (AARC, 2004, p. 1080). **Appropriate pressure may vary; check institutional policy.**
 15. If indicated, increase supplemental oxygen therapy to 100% or as ordered by physician. Encourage patient to deep-breathe.
 16. Preparation for all types of suctioning:
 - A. Open suction kit or catheter with use of aseptic technique. If a sterile drape is available, place it across the patient's chest or on the overbed table. Do not allow the suction catheter to touch any nonsterile surfaces.
- Abnormal anatomy can impair normal drainage of secretions. For example, nasal swelling, a deviated septum, or facial fractures may impair nasal drainage. Tumours in or around the lower airway may impair secretion removal by occluding or externally compressing the lumen of the airway.
 - Impairs patient's ability to cough independently or follow instructions to cough and clear airway.
 - Increases patient's risk for aspiration and subsequent pulmonary infection.
 - Increases volume of secretions in pharynx.
 - These conditions are contraindicated because the passage of the catheter through the nasal route causes trauma to existing facial trauma or surgery, increases nasal bleeding, or causes severe bleeding in the presence of bleeding disorders. With epiglottitis, croup, laryngospasm, or irritable airway, the entrance of a suction catheter via the nasal route causes intractable coughing, hypoxemia, and severe bronchospasm, necessitating emergency intubation or tracheostomy (Moore, 2003).
 - Certain bacteria are easier to transmit or require isolation because of virulence or antibiotic resistance.
 - Reveals need for patient instruction and encourages cooperation.
 - Some institutions require a physician's order for tracheal suctioning.
 - Encourages cooperation and minimizes risks, anxiety, and pain.
 - Facilitates secretion removal and may reduce frequency and duration of future suctioning.
 - Reduces stimulation of gag reflex, promotes patient comfort and secretion drainage, and prevents aspiration. Position lessens strain on the nurse's back. Hyperextension facilitates insertion of the catheter into the trachea.
 - Provides baseline oxygen level to determine patient's response to suctioning.
 - Reduces transmission of microorganisms by protecting gown from secretions.
 - Reduces transmission of microorganisms.
 - Excessive negative pressure damages nasal pharyngeal and tracheal mucosa and induces greater hypoxia.
 - Hyperoxygenation provides some protection from suction-induced decline in oxygenation. Hyperoxygenation is most effective in the presence of hyperinflation, such as when encouraging the patient to deep-breathe or to increase ventilator tidal volume settings (Demir & Dramali, 2005).
 - Prepares catheter and prevents transmission of microorganisms. A sterile drape provides sterile surface on which to lay the suction catheter between passes, if needed.

SKILL 38-1 Suctioning—cont'd



- B. Unwrap or open sterile basin and place on bedside table. Fill basin or cup with approximately 100 mL of sterile normal saline solution or water (see Step 16B illustration).



Step 16B Pouring sterile saline into basin.

- C. Turn on suction device. Set regulator to appropriate negative pressure: 100–150 mm Hg for adults (AARC, 2004).

17. Suction airway.

A. Oropharyngeal suctioning

- (1) Apply clean disposable gloves and mask or face shield (if splashing is likely).
 - (2) Attach suction catheter to connecting tubing. Check that equipment is functioning properly by suctioning a small amount of water or normal saline from the cup or basin.
 - (3) Remove oxygen mask if present. Keep oxygen mask near patient's face. Nasal cannula may remain in place (if present).
- Normal saline or water to flush catheter and tubing after each suction pass.
 - Suction of oral cavity does not require use of sterile gloves. Suction may cause splashing of body fluids.
 - Allows access to patient's mouth. Reduces chances of hypoxia.

Critical Decision Point: Be prepared to quickly reapply oxygen mask if SpO_2 falls or respiratory distress develops during or at the end of suctioning (Considine, 2005; Pease, 2006).

- (4) Insert catheter into the patient's mouth. With suction applied, move catheter around mouth, including pharynx and gum line, until secretions are cleared.
 - (5) Encourage patient to cough, and repeat suctioning if needed. Replace oxygen mask if used.
 - (6) Suction water from basin through catheter until catheter is cleared of secretions. Turn off suction.
 - (7) Place catheter in a clean, dry area for reuse.
- Movement of catheter prevents suction tip from invaginating oral mucosal surfaces, thus potentially causing trauma.
 - Coughing moves secretions from lower to upper airways into mouth.
 - Clearing secretions before they dry reduces the probability of transmission of microorganisms and enhances delivery of preset suction pressures.
 - Facilitates prompt removal of airway secretions when suctioning is needed in the future. Moist environment encourages microorganism growth.

Critical Decision Point: Keep catheter in nonairtight container such as brown paper or plastic bag attached to bed rail or in suction canister area. Do not store the catheter where it will come in contact with secretions or excretions, which promote bacterial growth.

B. Nasopharyngeal and nasotracheal suctioning

- (1) Open lubricant. Squeeze small amount onto open sterile catheter package without touching package. Lubricant is not necessary for artificial airway suctioning.
 - (2) Apply sterile glove to each hand, or apply nonsterile glove to nondominant hand and sterile glove to dominant hand.
- Prepares lubricant while maintaining sterility. Water-soluble lubricant is used to avoid lipoid aspiration pneumonia. Excessive lubricant can occlude the catheter.
 - Reduces transmission of microorganisms and allows nurse to maintain sterility of suction catheter.

Continued

► SKILL 38-1 Suctioning—cont'd

video

- (3) Pick up suction catheter with dominant hand without touching nonsterile surfaces. Pick up connecting tubing with nondominant hand. Secure catheter to tubing (see Step 17B[3] illustration).



Step 17B(3) Attaching catheter to suction.

- (4) Check that the equipment is functioning properly by suctioning a small amount of normal saline solution from the basin.
- (5) Lightly coat distal 6–8 cm of catheter with water-soluble lubricant.
- (6) Remove oxygen delivery device, if applicable, with nondominant hand. *Without applying suction* and using dominant thumb and forefinger, gently insert catheter into naris during inhalation.
- (7) *Nasopharyngeal*: Follow natural course of naris; slightly slant catheter downward and advance to back of pharynx. In adults, insert catheter about 16 cm; in older children, 8–12 cm; in infants and young children, 4–8 cm. The rule of thumb is to insert catheter a distance from tip of nose (or mouth) to angle of mandible.
- (a) Apply intermittent suction for 10–15 seconds by placing and releasing nondominant thumb over catheter vent. Slowly withdraw catheter while rotating it back and forth between thumb and forefinger.
- (8) *Nasotracheal*: Follow natural course of naris and advance catheter slightly slanted and downward to just above entrance into trachea. Allow patient to take a breath. Quickly insert catheter approximately 20 cm (in adult) into trachea (see Step 17B[8] illustration). Patient will begin to cough. *Note*: In older children, advance 16–20 cm; in young children and infants, 8–14 cm.
- Maintains catheter sterility. Connects catheter to suction.
 - Ensures equipment function; lubricates catheter and tubing.
 - Lubricates catheter for easier insertion.
 - Application of suction pressure while introducing catheter into nasopharyngeal tissues increases risk of damage to mucosa. When advanced into trachea, suction could damage mucosa and increase risk of hypoxia.
 - Proper placement ensures removal of pharyngeal secretions.
 - Intermittent suction safely removes pharyngeal secretions. Suction time of >15 seconds increases risk for suction-induced hypoxemia (Oh & Seo, 2003).
 - Ensures catheter will be inserted into trachea.



Step 17B(8) Distance of insertion of nasotracheal catheter.

► SKILL 38-1 Suctioning—cont'd



Critical Decision Point: Insert catheter during patient inhalation, especially if inserting catheter into trachea because epiglottis is open. *Do not insert during swallowing* or catheter will most likely enter the esophagus. *Never* apply suction during insertion. Patient should cough. If patient gags or becomes nauseated, catheter is most likely in the esophagus and must be removed.

- (a) *Positioning option for nasotracheal suctioning:* In some instances, turning the patient's head to the right will help you suction the left mainstem bronchus; turning head to the left will help you suction the right mainstem bronchus. If resistance is felt after insertion of catheter for maximum recommended distance, the catheter has probably hit carina. Pull the catheter back 1–2 cm before applying suction.
 - Turning the patient's head to the side elevates the bronchial passage on the opposite side and facilitates passage of the catheter.

Critical Decision Point: Use nasal approach and perform tracheal suctioning before pharyngeal suctioning whenever possible. The mouth and pharynx contain more bacteria than the trachea does. If copious oral secretions are present before beginning the procedure, suction the mouth with an oral suction device.

- (b) Apply intermittent suction for 10–15 seconds by placing and releasing nondominant thumb over vent of catheter and slowly withdrawing catheter while rotating it back and forth between dominant thumb and forefinger. Encourage patient to cough. Replace oxygen device, if applicable.
 - Intermittent suction and rotation of catheter prevent injury to mucosa. If the catheter “grabs” mucosa, remove thumb to release suction. Suctioning longer than 15 seconds can cause cardiopulmonary compromise, usually from hypoxemia or vagal overload.

Critical Decision Point: If ordered to monitor patient's vital signs and oxygen saturation during the procedure, note if the patient's pulse drops more than 20 beats per minute or increases more than 40 beats per minute, or oxygen saturation falls below 90% or 5% from baseline, in which case cease suctioning (Lindgren & Ames, 2005).

- (9) Rinse catheter and connecting tubing with normal saline or water until cleared.
 - Removes secretions from catheter. Secretions that remain in suction catheter or connecting tubing decrease suctioning efficiency.
 - (10) Assess for need to repeat suctioning procedure. Do not perform more than two passes with the catheter. Allow adequate time (at least one minute) between suction passes for ventilation and oxygenation (AARC, 2004). Ask patient to deep-breathe and to cough.
 - Observe for alterations in cardiopulmonary status. Suctioning can induce hypoxemia, dysrhythmias, laryngospasm, and bronchospasm. Deep breathing reventilates and reoxygenates alveoli and reduces the risk for suction-induced hypoxemia (Bourgault et al., 2006). Repeated passes clear the airway of excessive secretions but can also remove oxygen and may induce laryngospasm.
- C. Artificial airway suctioning
- (1) Apply face shield.
 - Reduces transmission of microorganisms.
 - (2) Apply one sterile glove to each hand, or apply nonsterile glove to nondominant hand and sterile glove to dominant hand.
 - Reduces transmission of microorganisms and allows nurse to maintain sterility of suction catheter.
 - (3) Pick up suction catheter with dominant hand without touching nonsterile surfaces. Pick up connecting tubing with nondominant hand. Secure catheter to tubing.
 - Maintains catheter sterility. Establishes suction.
 - (4) Check that equipment is functioning properly by suctioning a small amount of saline from the basin.
 - Ensures equipment function; lubricates catheter and tubing.
 - (5) Hyperinflate or hyperoxygenate patient, or do both, before suctioning, using manual resuscitation bag-valve device connected to oxygen source on mechanical ventilator. Some mechanical ventilators have a button that, when pushed, delivers oxygen for a few minutes and then resets to the previous value.
 - Hyperinflation decreases risk for atelectasis caused by negative pressure of suctioning (Demir & Dramali, 2005). Preoxygenation converts a large proportion of resident lung gas to 100% oxygen to offset the amount used in metabolic consumption while ventilator or oxygenation is interrupted, and to offset volume lost during suction procedure (Bourgault et al., 2006).

Critical Decision Point: Suctioning can cause elevations in intracranial pressure (ICP) in patients with head injuries. Reduce this risk by presuction hyperventilation, which results in hypocarbia, thus inducing vasoconstriction. Vasoconstriction reduces the potential for an increase in ICP. Limit suctioning to two times with each suctioning procedure (Considine, 2005; Demir & Dramali, 2005).

- (6) If patient is receiving mechanical ventilation, open swivel adapter or, if necessary, remove oxygen or humidity delivery device with nondominant hand.
 - Exposes artificial airway.

Continued

► SKILL 38-1 Suctioning—cont'd



- (7) Without applying suction, gently but quickly insert catheter using dominant thumb and forefinger into artificial airway (it is best to time catheter insertion with inspiration) until resistance is met or patient coughs, then pull back 1 cm.

- Application of suction pressure while introducing catheter into the trachea increases risk of damage to tracheal mucosa and greater hypoxia through removal of entrained oxygen present in airways. The action of pulling back stimulates cough and removes catheter from mucosal wall so that catheter is not resting against tracheal mucosa during suctioning.

Critical Decision Point: If unable to insert catheter past the end of the endotracheal tube, the catheter is probably caught in the Murphy eye (i.e., side hole at the distal end of the endotracheal tube that allows for collateral airflow in the event of main stem intubation) (Lindgren & Ames, 2005). If this happens, rotate catheter to reposition it away from the Murphy eye, or withdraw it slightly and reinsert with the next inhalation. Usually the catheter meets resistance at the carina. One indication that the catheter is at the carina is acute onset of coughing, because the carina contains many cough receptors. The catheter should be pulled back 1 cm.

- (8) Apply intermittent suction by placing and releasing nondominant thumb over vent of catheter; slowly withdraw catheter while rotating it back and forth between dominant thumb and forefinger (see Step 17C[8] illustration). Encourage patient to cough. Watch for respiratory distress.

- Intermittent suction and rotation of catheter prevent injury to tracheal mucosal lining. If catheter “grabs” mucosa, remove thumb to release suction.



Step 17C(8) Suctioning tracheostomy.

Critical Decision Point: If patient develops respiratory distress during suction procedure, immediately withdraw catheter and supply additional oxygen and breaths as needed. Oxygen can be administered directly through the catheter in an emergency. Disconnect suction and attach oxygen at prescribed flow rate through the catheter.

- (9) If patient is receiving mechanical ventilation, close swivel adapter or replace oxygen delivery device.
- (10) Encourage patient to deep-breathe, if able. Some patients respond well to several manual breaths from the mechanical ventilator or bag-valve device.
- (11) Rinse catheter and connecting tubing with normal saline until clear. Use continuous suction.
- (12) Assess patient's cardiopulmonary status for secretion clearance and complications. Repeat Steps 17C(5) through 17C(11) once or twice more to clear secretions. Allow adequate time (at least one full minute) between suction passes for ventilation and reoxygenation. Perform oropharyngeal suctioning to clear mouth of secretions (Steps 17A, 17B). Do not suction nose again after suctioning mouth.
18. Complete procedure:
- Disconnect catheter from connecting tubing. Roll catheter around fingers of dominant hand. Pull glove off inside out so that catheter remains in glove. Pull off other glove over first glove in same way to contain contaminants. Discard into appropriate receptacle.
 - Remove towel and place in laundry or remove drape and discard in appropriate receptacle.
- Re-establishes the artificial airway.
 - Reoxygenates and re-expands alveoli. Suctioning can cause hypoxemia and atelectasis.
 - Removes catheter secretions. Secretions left in tubing decrease suction and provide environment for microorganism growth. Secretions left in connecting tube decrease suctioning efficiency.
 - Suctioning can induce dysrhythmias, hypoxia, and bronchospasm and impair cerebral circulation or adversely affect hemodynamics (Demir & Dramali, 2005; Lindgren & Ames, 2005).
 - The upper airway is considered clean and lower airway is considered sterile. Therefore, the same catheter can be used to suction from sterile to clean areas, but not from clean to sterile areas.
 - Reduces transmission of microorganisms. Clean equipment should not be touched with contaminated gloves.

► SKILL 38-1 Suctioning—cont'd



- C. Reposition patient as indicated by condition. You may need to reapply clean gloves for patient's personal care (e.g., oral hygiene).
 - D. If indicated, readjust oxygen to original level.
 - E. Discard remainder of normal saline into appropriate receptacle. If basin is disposable, discard into appropriate receptacle. If basin is reusable, rinse and place in soiled utility room.
 - F. Remove and discard face shield, and perform hand hygiene.
 - G. Place unopened suction kit on suction machine table or at head of bed according to institution preference.
19. Compare patient's vital signs and SpO₂ saturation before and after suctioning.
 20. Ask patient if breathing is easier and if congestion is decreased.
 21. Observe airway secretions.
- Proper positioning based on patient's condition promotes comfort, encourages secretion drainage, and reduces risk of aspiration.
 - Helps patient's blood oxygen level return to baseline.
 - Solution is contaminated.
 - Reduces transmission of microorganisms.
 - Provides for immediate access of suction catheter and equipment in the event of an emergency or for the next suctioning procedure.
 - Identifies physiological effects of suction procedure to restore airway patency.
 - Provides subjective confirmation that airway obstruction is relieved with suctioning procedure.
 - Provides data to document presence or absence of respiratory tract infection.

Unexpected Outcomes

Worsening respiratory status

Return of bloody secretions

Unable to pass suction catheter through first naris attempted

Paroxysms of coughing

No secretions obtained

Related Interventions

- Limit length of suctioning.
- Determine need for more frequent suctioning, possibly of shorter duration.
- Determine need for supplemental oxygen, supply oxygen between suction passes.
- Notify physician.
- Determine amount of suction pressure used. It may need to be decreased.
- Ensure suction completed correctly by using intermittent suction and rotation of catheter.
- Evaluate suctioning frequency.
- Provide more frequent oral hygiene.
- Try other naris or oral route.
- Insert nasal airway, especially if suctioning through patient naris frequently.
- Guide catheter along naris floor to avoid turbinates.
- If obstruction is mucus, apply suction to relieve obstruction, but do not apply suction to mucosa. If obstruction is thought to be a blood clot, consult physician.
- Increase lubrication of catheter.
- Administer supplemental oxygen.
- Allow patient to rest between passes of suction catheter.
- Consult physician regarding need for inhaled bronchodilators or topical anaesthetics.
- Evaluate patient's fluid status.
- Assess for signs of infection.
- Determine need for chest physiotherapy.
- Assess adequacy of humidification on oxygen delivery device.

Recording and Reporting

- Record the amount, consistency, colour, and odour of secretions and patient's response to procedure; document patient's pre-suctioning and post-suctioning cardiopulmonary status.

Home Care Considerations

- You need to adhere to best practices for infection control while weighing cost-effectiveness in the setting of a chronic situation. If the patient has an established tracheostomy or requires long-term nasotracheal suctioning and infection is not present, clean suction technique is appropriate.
- Instruct the patient and family in infection-control measures for emptying the secretion jar. These secretions should be emptied in the toilet but they have a splash risk. Instruct the caregiver to apply a mask (shield if available) and gloves and bring the secretion jar as close to the toilet bowl as possible to decrease the risk of splash.

and the patient is less fatigued, the patient may be able to expectorate or swallow the mucus, and suctioning is no longer required.

Orotracheal and Nasotracheal Suctioning. Orotracheal or nasotracheal suctioning is necessary when the patient with pulmonary secretions is unable to manage secretions by coughing and does not have an artificial airway (see Skill 38-1). A catheter is passed through the mouth or nose into the trachea. The nose is the preferred route because stimulation of the gag reflex is minimal. The procedure is similar to nasopharyngeal suctioning, but the catheter tip is moved farther into the patient's trachea. The entire procedure from catheter passage to its removal should be done quickly, lasting no longer than 15 seconds (American Association of Respiratory Care [AARC], 2004). Unless in respiratory distress, the patient should be allowed to rest between passes of the catheter. If the patient is using supplemental oxygen, the oxygen cannula or mask should be replaced during rest periods.

Tracheal Suctioning. Tracheal suctioning is accomplished through an artificial airway such as an endotracheal tube or tracheostomy tube (see Skill 38-1). The suction catheter should be no greater than one-half the size of the internal diameter of the artificial airway (Moore, 2003). Secretion removal should be as atraumatic as possible. To avoid trauma to the mucosa of the lung, never apply suction pressure while inserting the catheter, and maintain suction pressure between 100 and 150 mm Hg (AARC, 2004). Apply suction intermittently as the catheter is withdrawn. Rotating the catheter will enhance removal of secretions that have adhered to the sides of the endotracheal tube. Apply a mask and goggles, and wear a barrier gown to prevent splashes with body fluids.

The practice of normal saline instillation (NSI) into artificial airways to improve secretion removal is inconclusive. Clinical studies comparing suctioning after NSI with standard suctioning have not demonstrated any clinical or significant results (Celik & Kanan, 2006). More recently, some clinicians have recommended that instillation of isotonic sodium chloride before suctioning of an endotracheal tube not be used as routine or standard clinical practice (Akgul & Kanan, 2006). There are anecdotal results supporting the theory that NSI stimulates the patient to cough, thus loosening and dislodging the airway secretions. However, the practice of NSI via an endotracheal tube may decrease oxygen saturation, increase intracranial pressure and arterial blood pressure, and cause cardiac dysrhythmias, cardiac arrest, respiratory arrest, and nosocomial infection (Akgul & Kanan, 2006). The use of isotonic normal saline with suctioning has the potential to increase ventilator-associated pneumonia as bacteria can move from the upper to lower airway (Celik & Kanan, 2006; Grap & Munro, 2004).

The two current methods of suctioning are the open and closed methods. Open suctioning involves a sterile catheter that is opened at the time of suctioning. Wear sterile gloves to perform the suction procedure. Closed suctioning involves a multiple-use suction catheter encased in a plastic sheath (Figure 38-11). Closed suctioning is most often used on patients who require mechanical ventilation to support their respiratory efforts, because it permits continuous delivery of oxygen while suction is performed, thus reducing the risk of oxygen desaturation. Although sterile gloves are not required in this procedure, at least nonsterile (i.e., disposable) gloves are recommended to prevent contact with splashes from body fluids.



Figure 38-11 Ballard tracheal care, closed suction.



Figure 38-12 Artificial oral airways.

Artificial Airways. An artificial airway is indicated for patients with a decreased level of consciousness or an airway obstruction and to aid in the removal of tracheobronchial secretions.

Oral Airway. The oral airway, the simplest type of artificial airway, prevents obstruction of the trachea by displacement of the tongue into the oropharynx (Figure 38-12). The oral airway extends from the teeth to the oropharynx, maintaining the tongue in the normal position. The correct-size airway must be used. Proper oral airway size is determined by measuring the distance from the corner of the mouth to the angle of the jaw just below the ear. The length is equal to the distance from the flange of the airway to the tip. If the airway is too small, the tongue is not held in the anterior portion of the mouth; if the airway is too large, it may force the tongue toward the epiglottis and obstruct the airway.

Insert the airway by turning the curve of the airway toward the cheek and placing it over the tongue. When the airway is in the oropharynx, turn it so that the opening points downward. When correctly placed, the airway moves the tongue forward away from the oropharynx, and the flange, the flat portion of the airway, rests against the patient's teeth. Incorrect insertion merely forces the tongue back into the oropharynx.

Endotracheal and Tracheal Airway. The presence of an artificial airway places the patient at high risk for infection and

airway injury. Use sterile technique in caring for and maintaining an artificial airway to prevent nosocomial infections. Artificial airways need to be cared for and maintained in the correct position to prevent airway damage (Skill 38-2).

Endotracheal (ET) tubes are used as short-term artificial airways to administer mechanical ventilation, relieve upper airway obstruction, protect against aspiration, or clear secretions. ET tubes are generally removed within 14 days; however, they may be used for a longer period of time if the patient is showing progress toward weaning from mechanical ventilation and extubation.

If the patient requires long-term assistance from an artificial airway, a tracheostomy is considered. A surgical incision is

made into the trachea, and a short artificial airway (a tracheostomy tube) is inserted.

Maintenance and Promotion of Lung Expansion.

Nursing interventions to maintain or promote lung expansion include noninvasive and invasive techniques. Noninvasive techniques are positioning and incentive spirometry. An invasive procedure is management of a chest tube.

Positioning. In the healthy, completely mobile person, adequate ventilation and oxygenation are maintained by frequent position changes during daily activities. However, when a person's illness or injury restricts mobility, there is an increased risk for respiratory impairment. Frequent changes of

Text continued on p. 920

► SKILL 38-2 Care of an Artificial Airway

video

Delegation Considerations

This skill should not be routinely delegated to nursing assistive personnel (NAP). It is your responsibility to perform endotracheal care. In some settings, patients who have well-established tracheostomy tubes may have the care delegated to NAPs. It is your responsibility to assess and ensure that proper artificial airway care is provided. In addition, NAPs may perform other aspects of the patient's care. You must instruct the NAP about the following:

- To report any changes in the patient's respiratory status, level of consciousness, confusion, restlessness, irritability, or pain
- To report abnormal colour of tracheal stoma and drainage
- Emergency procedures in case the tracheostomy tube inadvertently becomes dislodged when ties are changed

Equipment

Endotracheal (ET) Tube Care

- Towel
- ET and oropharyngeal suction equipment
- 2.5 to 3 cm adhesive or waterproof tape (not paper or silk tape) or commercial ET tube holder and mouthguard (follow manufacturer's instructions for securing)
- Two pairs of disposable (nonsterile) gloves
- Adhesive remover swab or acetone on a cotton ball
- Mouth care supplies (e.g., toothbrush, toothpaste, nonalcoholic mouthwash)
- Face cleanser (e.g., wet washcloth, towel, soap, shaving supplies)
- Clean 2 × 2 gauze
- Tincture of benzoin, liquid adhesive, or skin prep pads
- Mask, goggles, face shield (if indicated)
- Stethoscope

Tracheostomy Care

- Towel
- Tracheostomy suction supplies
- Sterile tracheostomy care kit, if available, or two sterile 4 × 4 gauze pads
- Sterile cotton-tipped applicators
- Sterile tracheostomy dressing
- Sterile basin
- Small sterile brush (or disposable cannula)
- Tracheostomy ties (e.g., twill tape, manufactured tracheostomy ties, Velcro tracheostomy ties)
- Normal saline (NS)
- Scissors
- Two sterile gloves
- Mask, goggles, face shield (if indicated)

Procedure

STEPS

1. Perform pulmonary assessment:
 - A. Auscultate lung sounds.
 - B. Assess condition and patency of airway and surrounding tissues.
 - C. Note type and size of tube, movement of tube, and cuff size.

RATIONALE

- Provides baseline information.
- Indicates if additional skin care to irritated areas is needed. Identifies potential pressure areas.
- Movement of tube predisposes the patient to tracheal trauma or tube dislodgement and may indicate the need for another size airway. Cuff size indicates the amount of air needed to properly inflate cuff.

Continued

► SKILL 38-2 Care of an Artificial Airway—cont'd



2. Explain procedure to the patient and family.
3. Position patient: Usually supine or semi-Fowler's.
4. Place towel across patient's chest.
5. Perform hand hygiene. Apply mask, goggles, or face shield (if indicated).
6. Perform airway care.
 - A. Endotracheal tube care
 - (1) Observe for signs and symptoms of need to perform care of the artificial airway:
 - (a) Soiled or loose tape
 - (b) Pressure sores on nares, lip, or corner of mouth
 - (c) Unstable tube
 - (d) Excessive secretions
 - (2) Identify factors that increase the risk of complications from ET tubes:
 - (a) Type and size of tube
 - (b) Movement of tube up and down trachea
 - (c) Cuff size
 - (d) Duration of placement
 - (3) Determine proper ET tube depth as noted by centimetres at lip or gum line. This line is marked on the tube and recorded in the patient's record at time of intubation.
 - (4) Suction ET tube (see Skill 38-1):
 - Reinforces information given to patient and family and provides an opportunity for them to ask additional questions.
 - Provides access to the site and facilitates completion of the procedure.
 - Reduces transmission of microorganisms and protects linens and bedclothes.
 - Reduces transmission of microorganisms.
 - A patient with an artificial airway is at increased risk because of the inability to control secretions or difficulty in controlling them, and because of pressure points of the artificial airway.
 - A tube moving up and down the trachea predisposes the patient to tracheal trauma or dislodgement. Cuff underinflation may allow aspiration, whereas overinflation causes tracheal mucosa injury (Hess, 2005).
 - Ensures that tube is a proper depth to adequately ventilate both lungs and that tube is not too high (causing vocal cord damage) or too low (causing right main-stem intubation thus ventilating only right lung).
 - Removes secretions. Diminishes patient's need to cough during procedure.

Critical Decision Point: An oral airway should be immediately accessible in the event that the patient bites down and obstructs the ET tube.

- (a) Instruct patient not to bite or move ET tube with tongue or pull on tubing; removal of tape can be uncomfortable.
- (b) Leave Yankauer suction catheter connected to suction source.
- (5) Prepare method to secure endotracheal tube (check agency policy).
 - (a) *Tape method:* Cut piece of tape long enough to go completely around patient's head from naris to naris plus 15 cm; for an adult, approximately 30–60 cm. Lay adhesive side up on bedside table. Cut and lay 8–15 cm of tape, adhesive side down, in centre of long strip to prevent tape from sticking to hair.
 - (b) *Commercially available endotracheal tube holder:* Open package per manufacturer's instructions. Set device aside with the head guard in place and the Velcro strips open.
- (6) Apply clean gloves, and instruct assistant to apply gloves and hold ET tube firmly at patient's lips. Note the number marking on the ET tube at the gum line.
 - Prepares patient for procedure and what to expect.
 - Prepares for oropharyngeal suctioning.
 - Adhesive tape must be placed around the head from cheek to cheek below the ears. Avoid placing it over the ears, as this may result in a pressure sore.
 - Commercial devices are latex-free, fast, and convenient.
 - Reduces transmission of microorganisms. Maintains proper tube position and prevents accidental extubation.

Critical Decision Point: Do not allow helper to hold the tube away from the lips or nares. Doing so allows too much "play" in the tube and increases the risk for tube movement and accidental extubation. Never let go of the ET tube because the tube could become dislodged.

- (7) Remove old tape or device.
 - (a) *Tape:* Carefully remove tape from ET tube and patient's face. If tape is difficult to remove, moisten it with (soapy) wet washcloth, water, or adhesive tape remover. Discard tape in appropriate receptacle if nearby. If not, place soiled tape on bedside table or on distant end of towel.
 - (b) *Commercially available device:* Remove Velcro strips from ET tube, and remove ET tube holder from patient.
 - Provides access to skin under tape for assessment and hygiene. Reduces transmission of microorganisms.
 - The Velcro adhesive strips hold the ET tube in place and provide a marker to measure distance to patient's lips or gums. These devices permit access to patient's mouth and lips for ease in oropharyngeal suctioning and oral hygiene.

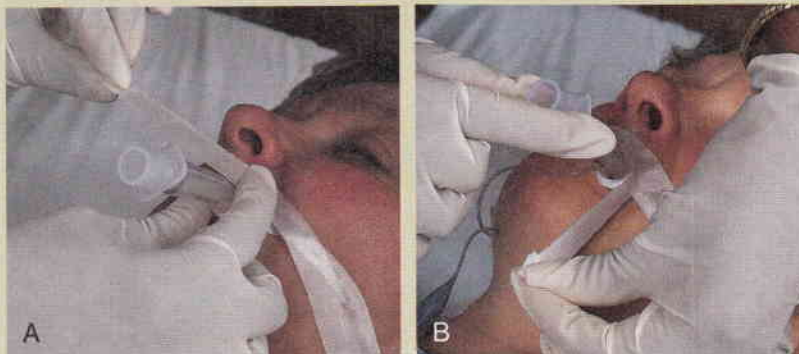
► SKILL 38-2 Care of an Artificial Airway—cont'd



- (8) Remove excess secretions or adhesive left on patient's face. Use adhesive remover swab to remove excess adhesive left on face after tape removal. Wash adhesive remover from face.
- (9) Remove oral airway or bite block if present.
- Promotes hygiene. Retained adhesive can cause damage to skin and prevent adhesion of new tape.
- Provides access and complete observation of patient's oral cavity.

Critical Decision Point: Do not remove oral airway if patient is actively biting. Wait until tape or device is partially or completely secured to ET tube.

- (10) Clean mouth, gums, and teeth opposite ET tube with nonalcoholic-based mouthwash solution and toothpaste on toothbrush or toothette. Brush teeth as indicated. If necessary, administer oropharyngeal suctioning with Yankauer catheter.
- (11) Note "cm" ET tube (oral ET tube only) marking at lips or gums. With help of assistant, move ET tube to opposite side or centre of mouth. Do not change tube depth (Vollman, 2006).
- (12) Repeat oral cleaning as in Step (9) on opposite side of mouth.
- (13) Clean face and neck with soapy washcloth; rinse and dry. Shave male patient as necessary.
- (14) Use small amount of skin protectant or liquid adhesive on clean 2 × 2 gauze and dot on upper lip (oral ET tube) or across nose (nasal ET tube) and cheeks to ear. Allow to dry completely.
- (15) Secure ET tube.
 - (a) *Tape method:*
 - (a1) Slip tape under patient's head and neck, adhesive side up. Do not twist tape or catch hair, or allow tape to stick to itself. It helps to stick tape gently to the tongue blade, which serves as a guide as tape is passed behind the patient's head. Centre tape so that double-faced tape extends around the back of the neck from ear to ear.
 - (a2) On one side of face, secure tape from ear to naris (nasal ET tube) or over lip to ET tube (oral ET tube). Tear remaining tape in half lengthwise, forming two pieces that are 1–2 cm wide. Secure bottom half of tape across upper lip (oral ET tube) or across top of nose (nasal ET tube; see Step 6A[15][a2] illustration, part A). Wrap top half of tape around tube (see Step 6A[15][a2] illustration, part B). Tape should encircle tube at least two times for security.
- Provides oral hygiene and allows for observation of any pressure ulcers. Alcohol-based mouthwashes dry oral mucosa (Lewis et al., 2010). Suctioning removes pooled secretions.
- Prevents formation of pressure sores at sides of patient's mouth. Ensures correct position of tube and allows for quick visual scan of displaced tube. Measuring the tube at the lip line can be distorted due to edema, trauma, or disease process (Vollman, 2006).
- Removes secretions from mouth and oropharynx.
- Moisture and beard growth prevent adhesive tape adherence.
- Protects and makes skin more receptive to tape.
- Positions tape to secure ET tube in proper position.
- Secures tape to face. Using top tape to wrap tube prevents downward drag on ET tube.



Step 6A(15)(a2) A, Securing bottom half of tape across patient's upper lip. B, Securing top half of tape around tube.

Continued

► SKILL 38-2 Care of an Artificial Airway—cont'd

video

- (a3) Gently pull other side of tape firmly to pick up slack, and secure it to remaining side of face (see Step 6A[15][a3] illustration). Have assistant release hold when tube is secure. You may want the assistant to help reinsert the oral airway.



Step 6A(15)(a3) Tape securing ET tube.

(b) Commercially available device:

- (b1) Place ET tube through opening designed to secure ET tube. Ensure that pilot balloon to the ET tube is accessible.
 - (b2) Place Velcro strips of ET holder under patient at occipital region of the head.
 - (b3) Verify that ET tube is at the established position using the lip or gum line as a guide.
 - (b4) Secure Velcro strips at base of the patient's head. Leave 1 cm slack in the strips.
 - (b5) Verify that tube is secure, that it does not move forward from patient's mouth or backward down into patient's throat. Ensure that there are no pressure areas on oral mucosa or occipital region of the head.
- Secures tape to face and ET tube. Tube should be at same depth at the lips. Check earlier assessment for verification of tube depth in centimetres.
 - Commercially available holders have a slit in the front of the holder designed to secure the ET tube.
 - Ensures that the ET tube remains at the correct depth as determined during assessment.
 - The ET tube needs to be secure so that the position of the tube remains at the correct depth.
 - The tube must be secure so that the position of the tube remains at the correct depth. The tube can be secured without being tight and causing pressure.
 - Promotes hygiene. Reduces transmission of microorganisms.
- (16) Clean oral airway in warm, soapy water and rinse well. A half hydrogen peroxide and half normal saline solution aids in removal of crusted secretions. A mouthwash rinse will freshen patient's mouth. Shake excess water from oral airway. Be sure to rinse hydrogen peroxide mixture from airway.
- (17) For unconscious patient, reinsert oral airway without pushing tongue into oropharynx.

B. Tracheostomy care

- (1) Observe for signs and symptoms of need to perform tracheostomy care:
 - (a) Soiled or loose ties or dressing
 - (b) Nonstable tube
 - (c) Excessive secretions
 - (2) Suction tracheostomy (see Skill 38-1). Before removing gloves, remove soiled tracheostomy dressing and discard in glove with coiled catheter.
 - (3) Prepare equipment:
 - (a) Open sterile tracheostomy kit. Open two 4 × 4 inch gauze packages using aseptic technique, and pour normal saline (NS) on one package. Leave the second package dry. Open two packages of cotton-tipped swabs and pour NS on one package. Do not recap NS.
- Prevents patient from biting ET tube and allows access for oropharyngeal suctioning. An oral airway in a conscious, cooperative patient may cause excessive gagging and pressure ulcers to the mouth and tongue.
 - A patient with a tracheostomy tube is at increased risk because of loss of natural airway protection of the upper airway.
 - Removes secretions so as not to occlude outer cannula while inner cannula is removed. Reduces need for patient to cough. Prevents aspiration of retained secretions.
 - Disposal method helps to contain microorganisms.
 - Preparation and organization of equipment allows for efficient tracheostomy care and reconnecting of the patient to an oxygen source in a timely manner.

► SKILL 38-2 Care of an Artificial Airway—cont'd

- (b) Open sterile tracheostomy dressing package.
 - (c) Unwrap sterile basin and pour approximately 0.5–2 cm of normal saline into it.
 - (d) Open small sterile brush package and place aseptically into sterile basin.
 - (e) Prepare length of twill tape long enough to go around patient's neck two times, approximately 60–75 cm for an adult. Cut ends on diagonal. Lay aside in dry area.
 - (f) If using commercially available tracheostomy tube holder, open package according to manufacturer's directions.
 - (4) Apply sterile gloves. Keep dominant hand sterile throughout procedure.
 - (5) Hyperoxygenate the patient, if the patient has oxygen saturation levels below 92% (Demir & Dramali, 2005). Apply oxygen source loosely over tracheostomy if patient desaturates during procedure.
- Cutting ends of tie on diagonal aids in inserting tie through eyelet.
 - Reduces transmission of microorganisms.
 - Helps reduce amount of desaturation.

Critical Decision Point: For tracheostomy tube with no inner cannula or Kistner button, continue with Step B(8).

- (6) If a nondisposable inner cannula is used:
 - (a) While touching only the outer aspect of the tube, unlock and remove inner cannula with nondominant hand. Drop inner cannula into normal saline basin.
 - (b) Place tracheostomy collar or T tube and ventilator oxygen source over or near outer cannula. (Note: T tube and ventilator oxygen devices cannot be attached to all outer cannulas when inner cannula is removed.)
 - (c) To prevent oxygen desaturation in affected patients, quickly pick up inner cannula and use small brush to remove secretions inside and outside cannula (see Step 6B[6][c] illustration).
 - (d) Hold inner cannula over basin and rinse with NS, using nondominant hand to pour NS.
 - (e) Replace inner cannula and secure "locking" mechanism (see Step 6B[6][e] illustration). Reapply ventilator or oxygen sources.
- Removes inner cannula for cleaning. Normal saline loosens secretions from inner cannula.
 - Maintains supply of oxygen to patient.
 - Tracheostomy brush provides mechanical force to remove thick or dried secretions.
 - Removes secretions from inner cannula.
 - Secures inner cannula and re-establishes oxygen supply.



Step 6B(6)(c) Cleaning the tracheostomy inner cannula.



Step 6B(6)(e) Reinserting the inner cannula.

- (7) If a disposable inner cannula is used:
 - (a) Remove cannula from manufacturer's packaging.
 - (b) While touching only the outer aspect of the tube, withdraw inner cannula and replace with new cannula. Lock into position.
 - (c) Dispose of contaminated cannula in appropriate receptacle and apply oxygen source.
- Prevents unnecessary oxygen desaturation.

Continued

► SKILL 38-2 Care of an Artificial Airway—cont'd

video

- (8) Using normal saline saturated cotton-tipped swabs and 4 × 4 gauze, clean exposed outer cannula surfaces and stoma under faceplate, extending 5–10 cm in all directions from stoma (see Step 6B[8] illustration). Clean in circular motion from stoma site outward, using dominant hand to handle sterile supplies.



Step 6B(8) Cleansing around stoma.

- (9) Using dry 4 × 4 gauze, pat lightly at skin and exposed outer cannula surfaces.
- (10) Secure tracheostomy.
- (a) *Tracheostomy tie method:*
- (a1) Instruct assistant, if available, to apply gloves and securely hold tracheostomy tube securely in place while ties are cut.

- Aseptically removes secretions from stoma site. Moving in outward circle pulls mucus and other contaminants from stoma to periphery.

- Dry surfaces prevent formation of moist environment conducive to growth of microorganisms and prevent skin excoriation.

- Promotes hygiene, reduces transmission of microorganisms, and secures tracheostomy tube.

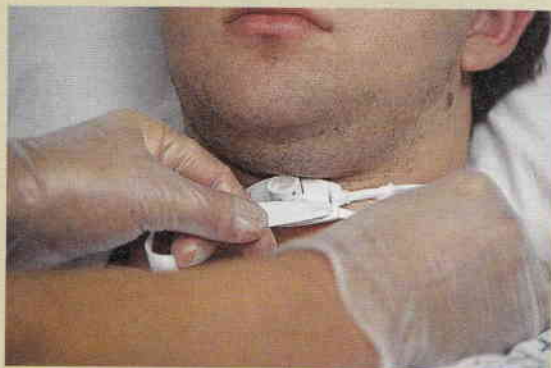
Critical Decision Point: Assistant must not release hold on tracheostomy tube until new ties are firmly tied to reduce risk of accidental extubation. If no assistant is present, do not cut old ties until new ties are in place and securely tied (Roman, 2005; St. John & Malen, 2004).

- (a2) Take prepared tie and insert one end of tie through faceplate eyelet, and pull ends even (see Step 6B[10][a2] illustration).

Critical Decision Point: Tracheostomy obturator should be kept at bedside with a fresh tracheostomy to facilitate reinsertion of the outer cannula, if dislodged. An additional tracheostomy tube of the same size and kind should be kept on hand for emergency replacement (Roman 2005; St. John & Malen, 2004).

- (a3) Slide both ends of tie behind head and around neck to other eyelet, and insert one tie through second eyelet.
- (a4) Pull snugly.
- (a5) Tie ends securely in double square knot, allowing space for only one loose or two snug finger widths in tie.
- (a6) Insert fresh tracheostomy dressing under clean ties and faceplate (see Step 6B[11][a6] illustration).

- Secures tracheostomy tube in place.
- One-finger slack prevents ties from being too tight when tracheostomy dressing is in place and prevents movement of tracheostomy tube into lower airway.
- Absorbs drainage. Dressing prevents pressure on clavicle heads.



Step 6B(10)(a2) Replacing tracheostomy ties when an assistant is not available. Do not remove old tracheostomy ties until new ones are secure.



Step 6B(10)(a6) Applying tracheostomy dressing.

SKILL 38-2 Care of an Artificial Airway—cont'd

video

(b) *Tracheostomy tube holder method:*

- (b1) While wearing gloves, maintain secure hold on tracheostomy tube. This can be done with an assistant, or, when an assistant is not available, by leaving the old tracheostomy tube holder in place until new device is secure.
- (b2) Align strap under patient's neck. Ensure that Velcro attachments are positioned on either side of tracheostomy tube.
- (b3) Place narrow end of ties under and through faceplate eyelets. Pull ends even, and secure with Velcro closures.
- (b4) Verify that there is space for only one loose or two snug finger width(s) under neck strap.

7. Position patient comfortably and assess respiratory status.

8. Replace any oxygen delivery devices.

9. Remove and discard gloves and face shield. Replace cap on normal saline. Perform hand hygiene.

10. Compare respiratory assessments before and after procedure.

11. Observe depth and position of tubes.

12. Assess security of tape or commercial ET or tracheostomy tube holder by tugging at tube.

13. Assess skin around mouth and oral mucosa (ET tube) and tracheostomy stoma for drainage, pressure, and signs of irritation.

- Prevents accidental displacement of tube.

- Promotes comfort. Some patients may require post-tracheostomy care suctioning.
- Maintains oxygen therapy.
- Reduces transmission of infection. Once opened, NS can be considered free of bacteria for 24 hours, after which it should be discarded.
- Identifies any changes in presence and quality of breath sounds after procedure.
- Verifies that position of tube is correct.
- Artificial airway should not move. Patient may cough.
- Skin breakdown or irritation should not be present.

Unexpected Outcomes*Accidental extubation**Breath sounds not equal bilaterally with ET tube in place**Hard, reddened areas with or without excessive or foul-smelling secretions**Insecure tube, artificial airway moves in or out, coughed out by patient**Breakdown, pressure areas, or stomatitis (tracheostomy tube)***Related Interventions**

- Call for assistance.
- Maintain patent airway. Replace old tracheostomy tube with new tube.
- Observe vital signs and signs of respiratory distress.
- Evaluate ET tube for proper depth. If incorrect, arrange for ET tube to be repositioned as allowed by institution.
- Obtain order for chest X-ray study to verify placement, if applicable.
- This indicates infection. Notify physician.
- Increase frequency of tube care.
- Remove inner cannula, if applicable, for cleaning and suctioning.
- Assess patient's respiratory status and observe for the presence of mucus plugs.
- Adjust or apply new ties.
- Increase frequency of tube care.
- Make sure skin areas are clean and dry.

Recording and Reporting

- Record respiratory assessments before and after care.
- Record ET tube care: depth of ET tube, frequency and extent of care, patient tolerance, and any complications related to presence of the tube.
- Record tracheostomy care: type and size of tracheostomy tube, frequency and extent of care, patient tolerance, and any complications related to presence of the tube.

Home Care Considerations (Tracheostomy Only)

- Instruct caregivers on how to obtain supplies.
- Instruct caregivers on signs and symptoms of respiratory distress, tube dysfunction, and respiratory and stoma infections.

position are simple and cost-effective methods for reducing the risks of stasis of pulmonary secretions and decreased chest wall expansion.

The most effective position for patients with cardiopulmonary diseases is the 45-degree semi-Fowler's position, using gravity to assist in lung expansion and reduce pressure from the abdomen on the diaphragm. When the patient uses this position, ensure that the patient does not slide down in bed, which could reduce lung expansion. A patient with unilateral lung disease (e.g., pneumothorax, atelectasis, pneumonia, thoracotomy, multiple trauma affecting one lung) should be positioned with the unaffected lung down ("good lung down"). This promotes better perfusion of the healthy lung, improving oxygenation. In the presence of pulmonary abscess or hemorrhage, the patient should be placed with the affected lung down to prevent drainage toward the unaffected (healthy) lung.

Incentive Spirometry. Incentive spirometry is a method of encouraging voluntary deep breathing by providing visual feedback to patients about inspiratory volume. Incentive spirometry is used to promote deep breathing and to prevent or treat atelectasis in the postoperative patient. The use of an incentive spirometer to promote lung expansion and thus prevent postoperative pulmonary complications following abdominal surgery is supported by research (Lawrence et al., 2006).

Flow-oriented incentive spirometers consist of one or more plastic chambers containing freely moving coloured balls. The patient inhales slowly and with an even flow to elevate the balls and keep them floating as long as possible to ensure a maximally sustained inhalation.

Volume-oriented incentive spirometry devices have a bellows that is raised to a predetermined volume by an inhaled breath (Figure 38-13). An achievement light or counter is used to provide feedback. Some devices are constructed so that the light will not turn on unless the bellows is held at a minimum desired volume for a specified period to enhance lung expansion.

The aim of incentive spirometry is to encourage patients to breathe to their normal inspiratory capacities. A postoperative inspiratory capacity one-half to three-fourths of the



Figure 38-13 Volume-oriented spirometer.

preoperative volume is acceptable because of postoperative pain. Administration of pain medications before incentive spirometry will help the patient achieve deep breathing by reducing pain and splinting (see Chapter 48).

Chest Tubes. Chest tubes are inserted to remove air and fluids from the pleural space, prevent air or fluid from re-entering the pleural space, and re-establish normal intrapleural and intrapulmonic pressures. A **chest tube** is a catheter inserted through the thorax to remove fluid or air. There are a variety of chest drainage systems on the market. In addition to the usual disposable waterless system, the traditional reusable-glass, three-bottle systems may still be used. One of the newest systems available is the mobile chest drain.

Mobile systems rely on gravity, not suction, for drainage. In specific patients, these mobile drains reduce the length of time needed for the chest tube, improve ambulation, and decrease the length of time in the hospital (Carroll, 2005). Mobile chest drains are lighter and smaller, thus the patient is able to move more easily (Carroll, 2005).

Chest tubes are commonly used after chest surgery and chest trauma and for pneumothorax or hemothorax to promote lung re-expansion (Skill 38-3).

A **pneumothorax** is a collection of air in the pleural space. The loss of negative intrapleural pressure causes the lung to collapse. There are a variety of mechanisms for a pneumothorax. It may occur spontaneously or as a result of chest trauma, such as a stabbing or the chest striking the steering wheel in a motor vehicle accident. A pneumothorax may also result from the rupture of an emphysematous bleb on the surface of the lung (a large bulla resulting from the destruction caused by emphysema) or from an invasive procedure, such as insertion of a subclavian IV line.

A patient with a pneumothorax usually feels pain as atmospheric air irritates the parietal pleura. The pain may be sharp and pleuritic. Dyspnea is common and worsens as the size of the pneumothorax increases.

A **hemothorax** is an accumulation of blood and fluid in the pleural cavity between the parietal and visceral pleurae, usually as a result of trauma. It produces a counterpressure and prevents the lung from full expansion. A hemothorax can also be caused by the rupture of small blood vessels from inflammatory processes, such as pneumonia or TB. In addition to pain and dyspnea, signs and symptoms of shock can develop if blood loss is severe.

Disposable systems, such as an Atrium or Pleur-Evac chest drainage system, are one-piece molded plastic units that provide for a single- or multiple-chamber closed drainage system (Figure 38-14). A single chamber system allows air from a pneumothorax to bubble out of the water seal and escape through the air outlet, preventing air from re-entering the intrapleural space (Perry, 2010, p. 702). A two- or three-chamber system drains both a hemothorax and a pneumothorax. The two-chamber system allows fluid to flow into a collection chamber and air flows into the water seal chamber (Perry, 2010, p. 702). A three-chamber system permits the drainage of fluid and air using controlled suction (Perry, 2010, p. 702). The two- and three-chamber systems have two compartments, one for fluid or blood and a second for a water seal or a one-way valve (Perry, 2010, p. 702). The three-chamber system has a third compartment for suction control which may or may not be used (Perry, 2010, p. 702).

There are two types of commercial drainage devices: water-seal and waterless systems. Although the principles of the

► SKILL 38-3 Care of Patients With Chest Tubes

Delegation Considerations

This skill should not be delegated to nursing assistive personnel (NAP). However, a NAP may assist with other aspects of the patient's care. It is important to inform the NAP of the following:

- Proper positioning of the patient with chest tubes to facilitate chest tube drainage and optimal function of the system
- How to ambulate and transfer a patient with chest drainage
- To report to the nurse any changes in vital signs, chest pain, sudden shortness of breath, or excessive bubbling in the water-seal chamber
- To immediately report to the nurse a disconnection of the system, any change in type and amount of drainage, sudden bleeding, or sudden cessation of bubbling.

Procedure

STEPS

1. Perform hand hygiene and assess patient.
 - A. Pulmonary status: Assess for respiratory distress, chest pain, breath sounds over affected lung area, and stable vital signs (see Chapter 30). Signs and symptoms of increased respiratory distress or chest pain include decreased breath sounds over the affected and nonaffected lungs, marked cyanosis, asymmetrical chest movements, presence of **subcutaneous emphysema** (air trapped in the subcutaneous tissue) around tube insertion site or neck, hypotension, and tachycardia (Carroll, 2002).
 - B. Vital signs, SpO₂, and level of orientation.
 - C. Pain: If possible, ask patient to rate level of pain on a scale of 0 to 10.
2. Observe:
 - A. Chest tube dressing and site surrounding tube insertion.
 - B. Tubing for kinks, dependent loops, or clots.
 - C. Chest drainage system, which should be upright and below level of tube insertion.
3. Provide two shodded hemostats or approved clamps for each chest tube, attached to the top of patient's bed with adhesive tape. Chest tubes are clamped only under specific circumstances per physician order or nursing policy and procedure:
 - A. To assess air leak.
 - B. To quickly empty or change disposable systems; performed by a nurse who has received education in the procedure.
 - C. To assess if patient is ready to have the chest tube removed (which is done by physician's order); monitor the patient for recurrent pneumothorax (Roman & Mercado, 2006).
4. Position patient.
 - A. Semi-Fowler's to high-Fowler's position to evacuate air (pneumothorax).
 - B. High-Fowler's position to drain fluid (hemothorax, effusion).
5. Maintain tube connection between chest and drainage tubes; ensure that it is intact and secured with waterproof adhesive tape. Check patency of air vents in system:

Equipment

- Disposable chest drainage system (see Figure 38-14)
- Suction source and set-up (wall canister or portable)
- Disposable (nonsterile) gloves
- 5 cm tape
- Sterile gauze sponges
- Two shodded hemostats

RATIONALE

- Signs and symptoms should reflect improvement in respiratory distress and chest pain after insertion of chest tube.
- Notify physician immediately.
- Changes in pulse and blood pressure may indicate infection, respiratory distress, or pain.
- Chest tubes can be painful and interfere with a patient's mobility, coughing and deep breathing, and rehabilitation.
- Ensures that dressing is intact and occlusive seal remains without air or fluid leaks and that area surrounding insertion site is free of drainage or skin irritation (Carroll, 2002).
- Maintains a patent, freely draining system, preventing fluid accumulation in the chest cavity. Presence of kinks, dependent loops, or clotted drainage increases the risk for infection, atelectasis, and tension pneumothorax (Allibone, 2003).
- Facilitates drainage; the system must be in this position to function properly.
- Shodded hemostats have a covering to prevent hemostat from penetrating the chest tube once changed. The use of these shodded hemostats or other clamp prevents air from re-entering the pleural space (Allibone, 2003).
- Permits optimal drainage of fluid and air.
- Air rises to the highest point in the chest. Pneumothorax tubes are usually placed on the anterior aspect at the midclavicular line, second or third intercostal space (Allibone, 2003).
- Permits optimal drainage of fluid. Posterior tubes are placed on the midaxillary line, fifth or sixth intercostal space.
- Secures chest tube to drainage system and reduces risk of air leak causing breaks in airtight system.

Continued

► SKILL 38-3 Care of Patients With Chest Tubes—cont'd

- A. Water-sealed vent must be without occlusion.
- B. Suction-control chamber vent must be without occlusion when suction is used.
- C. Confirm that valves are unobstructed. Waterless systems have relief valves without caps. For dry suction systems, the positive pressure relief valve must remain unobstructed.
- 6. Avoid excess tubing; the tubing should be laid horizontally across the patient bed or chair before dropping vertically into the drainage bottle. If the patient is in a chair and the tubing is coiled, the tubing should be lifted every 15 minutes to promote drainage.
- 7. Adjust tubing to hang in a straight line from top of mattress to drainage chamber. If chest tube is draining fluid, indicate time (e.g., 0900) that drainage was begun on drainage bottle's adhesive tape or on write-on surface of disposable commercial system.
- Permits displaced air to pass into atmosphere.
- Provides safety factor of releasing excess negative pressure into the atmosphere. Too little suction prevents lung re-expansion and increases patient risk for infection, atelectasis, and tension pneumothorax. Too much suction damages the lung tissue and perpetuates existing air leaks (Allibone, 2003).
- Provides safety factor of releasing excess negative pressure.
- The length of tubing should be tailored to each patient to avoid excessive coiling or loop formation. Fluid collection in the loop may occlude system thus predisposing patient to a tension pneumothorax (Roman & Mercado, 2006).
- Provides a baseline for continuous assessment of type and quality of drainage.

Critical Decision Point: Frequent gentle lifting of sections of the drain allows gravity to assist blood and other viscous material to move to the drainage bottle. Patients with recent chest surgery or trauma need to have the chest drain lifted based on the amount of drainage; some patients may require the chest drain lifted every 5-10 minutes until the volume decreases (Lehwaldt & Timmins, 2005).

Critical Decision Point: Check institutional policy before stripping or milking chest tubes. This practice is being discontinued at most institutions because it is believed that stripping the tube greatly increases intrathoracic pressure, which damages the pleural tissue and causes or worsens an existing pneumothorax. Although the literature is contradictory, milking may be done in selected patients (e.g., fresh postoperative thoracic surgery in presence of multiple clots). The rationale for this selective use of stripping or milking is that the presence of clotted tube drainage causes decreased rate of re-expansion and increases the risk for a tension pneumothorax (Allibone, 2003).

- 8. Perform hand hygiene.
- 9. Evaluate:
 - A. Vital signs and pulse oximetry as ordered or if patient's condition changes.
 - B. Chest tube dressing.
 - Reduces transmission of infection.
 - Provides ongoing data about the patient's level of oxygenation.
 - Appearance of drainage may be due to tube occlusion, causing drainage to exit around tube.

Critical Decision Point: Check the dressing carefully because it must remain occlusive. It can come loose from the skin, although this may not be readily apparent.

- C. Tubing: It should be free of kinks and dependent loops.
- D. Chest drainage system: It should be upright and below level of tube insertion. Note presence of clots or debris in tubing.
- E. Water seal for fluctuations with patient's inspiration and expiration.
 - (1) Waterless system: Diagnostic indicator for fluctuations for patient's inspirations and expirations.
 - (2) Water-seal system: Bubbling in the water-seal chamber.
 - (3) Water-seal system: Bubbling in the suction-control chamber (when using suction).
 - Straight and coiled drainage tube positions are optimal for pleural drainage. However, when a dependent loop is unavoidable, periodic lifting and drainage of the tube will promote pleural drainage (Allibone, 2003; Lehwaldt & Timmins, 2005).
 - The system must be in the upright position to function and facilitate proper drainage.
 - In a nonmechanically ventilated patient, fluid should rise in the water seal or diagnostic indicator with inspiration and fall with expiration. The opposite occurs in a patient who is mechanically ventilated. This indicates the system is properly functioning.
 - When system is initially connected to patient, bubbles are expected from the chamber. These are from air that was present in the system and in the patient's intrapleural space. After a short time, the bubbling stops. Fluid will continue to fluctuate in the water seal on inspiration and expiration until the lung is re-expanded or the system becomes occluded.
 - The suction-control chamber has constant gentle bubbling. Tubing remains free of obstruction and the suction source is turned to the appropriate setting.

► SKILL 38-3 Care of Patients With Chest Tubes—cont'd

- F. Waterless system: Bubbling in diagnostic indicator.
- G. Waterless system: The suction control (float ball) indicates the amount of suction that the patient's intrapleural space is receiving.
- H. Type and amount of fluid drainage: Note colour and amount of drainage, patient's vital signs, and skin colour. Assess the fluid in the collection tubing, not just the drainage in the collection chamber. The normal amount of drainage is as follows:
 - (1) In the adult: <50–200 mL/hour immediately after surgery in a mediastinal chest tube; approximately 500 mL in first 24 hours.
 - (2) In the adult: Between 100 and 300 mL of fluid may drain in a pleural chest tube in an adult during the first three hours after insertion. The 24-hour rate is 500–1000 mL. Drainage is grossly bloody during the first several hours after surgery and then changes to serous. Remember that a sudden gush of drainage may be retained blood and not active bleeding. This increase in drainage can result from patient position changes.
- Mechanism to observe for the presence of tidalling.
- The suction float ball dictates the amount of suction in the system. The float ball allows no more suction than allowed by its setting. If the suction source is set too low, the suction float ball cannot reach the prescribed setting. In this case, the suction must be increased for the float ball to reach the prescribed setting.
- A **mediastinal chest tube** is commonly used following open heart surgery. It is inserted in the mediastinum (below the sternum) and is connected to a drainage system. This tube drains blood or fluid thus preventing accumulation around the heart. Dark-red drainage is expected only in the postoperative period, turning serous with time.
- Re-expansion of lungs forces drainage into the tube. Coughing can also cause large gushes of drainage or air. Acute bleeding indicates hemorrhage.

Critical Decision Point: Inform the physician, remain with the patient, and assess vital signs and cardiopulmonary status if drainage suddenly increases, is bright red, or if there is >100 mL/hour of bloody drainage (except for the first three hours postoperative).

- I. Observe patient for decreased respiratory distress and chest pain, auscultate lung sounds over affected area, and monitor SpO₂.
 - An increase in respiratory distress and/or chest pain, decrease in breath sounds over affected and unaffected lungs, cyanosis, asymmetrical chest movements, subcutaneous emphysema around the insertion site or neck, hypotension, tachycardia, and/or a mediastinal shift are critical and indicate a change in patient status (e.g., excessive blood loss, tension pneumothorax) (Allibone, 2003). This must be reported immediately to the patient's health care provider.
 - May indicate the need for medication for pain.
- J. Pain: Ask patient to evaluate pain on a level of 0 to 10.

Unexpected Outcomes

Continuous bubbling in water-sealed chamber

Related Interventions

- This indicates a leak between the patient and water seal.
- Assess all connections between the patient and drainage system, and tighten any loose connections (Cerfolio, 2005).
- Check institution policy, and if instructed, cross-clamp chest tube close to patient's chest. If bubbling stops, air leak is inside patient's thorax or at chest tube insertion site. Unclamp tube, and notify physician immediately. Reinforce chest dressing. Leaving a chest tube clamped causes a tension pneumothorax and mediastinal shift.
- Gradually move clamps down drainage tubing away from the patient and toward the suction control chamber, moving one clamp at a time. When bubbling stops, the leak is in a section of tubing or connection between clamps. Replace tubing or secure connection and release clamp.

Continued

► SKILL 38-3 Care of Patients With Chest Tubes—cont'd

Chest tube is dislodged

Tension pneumothorax

Substantial increase in bright red drainage

No chest tube drainage

- Immediately apply pressure over chest tube insertion site.
- Have assistant apply occlusive gauze dressing and tape three sides.
- Notify physician.
- Determine that chest tubes are not clamped, kinked, or occluded. Obstructed chest tubes trap air in the intrapleural space when an air leak originates within the patient.
- Notify physician immediately.
- Prepare immediately for another chest tube insertion; obtain a flutter (Heimlich) valve or large-gauge needle for short-term emergency release of air in the intrapleural space. Have emergency equipment (e.g., oxygen, code cart) near patient.
- Obtain vital signs and monitor drainage.
- Assess patient's cardiopulmonary status and notify physician.
- Observe for kink and possible clot in the chest drainage system.
- Assess for mediastinal shift or respiratory distress (medical emergency) and notify physician.

Recording and Reporting

- Record in nurse's notes patency of chest; presence, type, and amount of drainage; presence of fluctuations; patient's vital signs; chest dressing status, amount of suction and water seal; and level of comfort.

Home Care Considerations

- Patients with chronic conditions (e.g., uncomplicated pneumothorax, effusions, empyema) that require a chest tube may be discharged home with smaller mobile chest drains. These systems do not have a suction-control chamber and use a mechanical one-way valve instead of a water-seal chamber (Carroll, 2002, 2005).
- Instruct patient in how to ambulate and remain active with a home chest tube drainage system.
- Provide patient with information on when to contact health care providers regarding changes in drainage system (e.g., chest pain, breathlessness, change in drainage).

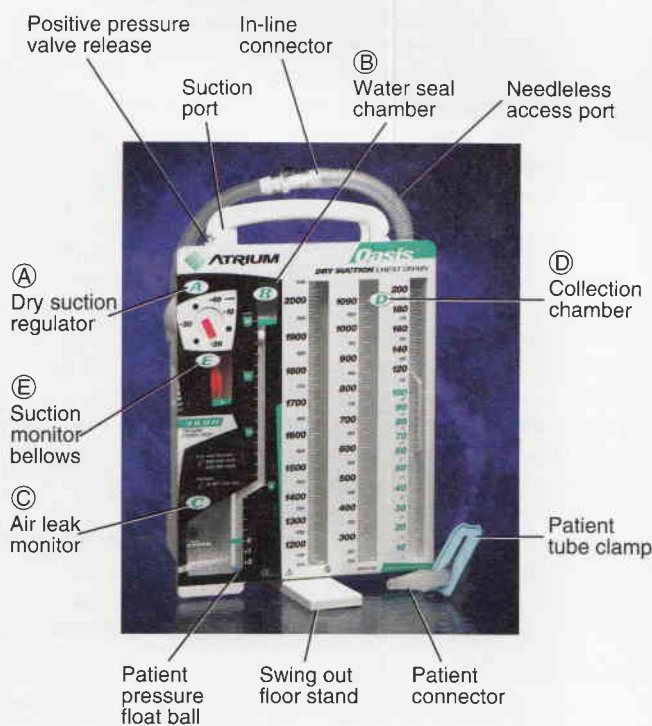


Figure 38-14 Dry suction chest drainage system. **Source:** Courtesy Atrium Medical Corp. From Perry, A. G., & Potter, P. A. (2010). *Clinical nursing skills & techniques* (7th ed., p. 705, Fig 26-8). St Louis, MO: Mosby.

waterless are similar to those of the water-seal system, there are structural differences. The waterless system does not require fluid for setup and the water seal is replaced by a one-way valve (Perry, 2010, p. 703). The suction chamber, which does not depend on water, contains a float ball that is set by a control dial after the suction source is initiated (Perry, 2010, p. 703). Dry suction chest drainage systems (Figure 38-14) provide higher suction pressure levels. A self-compensating regulator controls dry suction units, and a dial is set to the prescribed suction control setting (Perry, 2010, p. 704). Pressure is set between -10 cm H_2O and -40 cm H_2O .

Special Considerations. Clamping a chest tube at any time is inadvisable. Handle the chest drainage unit carefully and maintain the drainage device below the patient's chest. If the tubing disconnects from the drainage unit, instruct the patient to exhale as much as possible and to cough. This manoeuvre rids the pleural space of as much air as possible. Cleanse the tips of the tubing and reconnect them quickly. If the drainage unit is broken, the end of the chest tube can be quickly submerged in a container of sterile water to re-establish the seal. Clamping the chest tube may result in a tension pneumothorax. Air pressure builds in the pleural space, collapsing the lung and creating a life-threatening event.

Removal of chest tubes requires patient preparation. Patients report various sensations during chest tube removal. The most frequent sensations include burning, pain, and a pulling sensation.

Maintenance and Promotion of Oxygenation. Promotion of lung expansion and of mobilizing secretions and maintaining a patent airway assists the patient in meeting

oxygenation needs. Some patients, however, also require oxygen therapy to keep a healthy level of tissue oxygenation.

Oxygen Therapy. Oxygen therapy is widely available and used in a variety of settings to relieve or prevent tissue hypoxia (Gardner & Wilkins, 2009, p. 1256). The goal of oxygen therapy is to prevent or relieve hypoxia. Any patient with impaired tissue oxygenation can benefit from controlled oxygen administration. Oxygen is not a substitute for other treatment, however, and should be used only when indicated. Oxygen should be treated as a drug. It has dangerous side effects, such as atelectasis or oxygen toxicity (Heuer & Scanlan, 2009, p. 870). As with any drug, the dosage or concentration of oxygen should be continuously monitored. Routinely check the physician's orders to verify that the patient is receiving the prescribed oxygen concentration. The seven rights of medication administration also pertain to oxygen administration (see Chapter 33).

Safety Precautions. Oxygen is a highly combustible gas. Although it will not spontaneously burn or cause an explosion, it can easily cause a fire to ignite in a patient's room if it contacts a spark from an open flame or electrical equipment. With increasing use of home oxygen therapy, patients and health care providers must be aware of the dangers of combustion.

safety alert Oxygen in high concentrations has a great combustion potential and readily fuels fire.

Promote oxygen safety by using the following measures:

- Inform the patient, visitors, roommates, and all personnel that smoking is not permitted in areas where oxygen is in use.
- Ensure that all electrical equipment in the room is functioning correctly and is properly grounded (see Chapter 36). An electrical spark in the presence of oxygen can result in a serious fire.
- Locate the closest fire extinguisher.
- Know the fire procedures and the evacuation route for the area.
- Check the oxygen level of portable tanks before transporting a patient to ensure that enough oxygen in the tank exists to complete the transport.

Supply of Oxygen. Oxygen is supplied to the patient's bedside either by oxygen tanks or through a permanent wall-piped system. Oxygen tanks are transported on wide-based

carriers that allow the tank to be placed upright at the bedside. Regulators are used to control the amount of oxygen delivered. One common type is an upright flowmeter with a flow adjustment valve at the top. A second type is a cylinder indicator with a flow adjustment handle. In the home setting, oxygen therapy is also supplied in a variety of methods, including refillable cylinders (Cuvelier et al., 2002).

In the hospital or home, oxygen tanks are delivered with the regulator in place. In the hospital, the respiratory care department usually connects the regulator to the oxygen source. Home care vendors are usually responsible for connecting the oxygen tank to the regulator for home use.

Methods of Oxygen Delivery. Oxygen delivery devices can be considered low-flow or high-flow systems. **Low-flow devices** such as nasal cannulas, simple face masks, and reservoir masks provide oxygen in concentrations that vary with the patient's respiratory pattern (Heuer & Scanlan, 2009, p. 874; Kratochvil, 2005, p. 611). **High-flow devices** deliver oxygen rates above the normal inspiratory flow rate and thus provide a fixed FiO_2 (fraction of inspired oxygen) regardless of the patient's inspiratory flow and breathing pattern (Heuer & Scanlan, 2009, p. 873). The Venturi mask is an example of a high-flow device (Kratochvil, 2005, p. 611).

Nasal Cannula. A nasal cannula is a low-flow device used for oxygen delivery (Skill 38-4). The two cannulas, approximately 1.5 cm long, protrude from the centre of a disposable tube and are inserted into the nares (Figure 38-15). Oxygen is

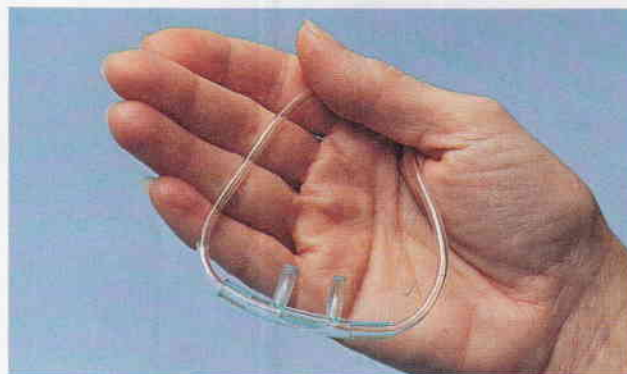


Figure 38-15 Nasal cannula.

► SKILL 38-4 Applying a Nasal Cannula or Oxygen Mask

video

Delegation Considerations

This skill cannot be delegated to nursing assistive personnel (NAP). You are responsible for assessing the patient and providing safe and accurate oxygen therapy, including adjustment of oxygen flow rate and evaluation of patient response. It is important to instruct the NAP about the following:

- Correct placement and adjustment of delivery device
- The type of equipment and the oxygen flow rate
- Unexpected outcomes associated with the oxygen delivery device (e.g., increased rate of breathing, decreased level of consciousness, increased confusion, pain, changes in vital signs) and the need to inform you if any of these outcomes occur

Equipment

- Oxygen delivery device (e.g., nasal cannula or oxygen mask)
- Oxygen tubing
- Humidifier, if indicated
- Sterile water for humidification, if indicated
- Oxygen source
- Oxygen flowmeter
- Appropriate room signs

Continued

► SKILL 38-4 Applying a Nasal Cannula or Oxygen Mask—cont'd

video

Procedure

STEPS

1. Inspect patient for signs and symptoms associated with hypoxia and presence of airway secretions.

Critical Decision Point: Patients with sudden changes in their vital signs, level of consciousness, or behaviour may be experiencing profound hypoxia. Patients who demonstrate subtle changes over time may have worsening of a chronic or existing condition or have a new medical condition (Jarvis, 2006).

2. Obtain patient's most recent SpO₂ or arterial blood gas (ABG) values. Review patient's medical record for the medical order for oxygen, noting delivery method, flow rate, and duration of oxygen therapy.
3. Explain to the patient and family what the procedure entails and the purpose of oxygen therapy.
4. Perform hand hygiene.
5. Attach oxygen delivery device (e.g., nasal cannula, mask) to oxygen tubing and attach to humidified oxygen source adjusted to prescribed flow rate (see Step 5 illustration).
6. Place tips of cannula into patient's nares, and adjust elastic headband or plastic slide until cannula or face mask fits snugly and comfortably (see Step 6 illustration).

RATIONALE

- Left untreated, hypoxia can produce cardiac dysrhythmias and death. Presence of airway secretions decreases the effectiveness of oxygen delivery.
- Provides objective baseline data to use to compare outcome of oxygen therapy. Ensures safe and accurate oxygen administration.
- Decreases patient's anxiety, which reduces oxygen consumption and increases patient cooperation.
- Reduces transmission of infection.
- Humidity prevents drying of nasal and oral mucous membranes and airway secretions. Ensures correct oxygen delivery.
- Directs flow of oxygen into patient's upper respiratory tract. Patient is more likely to keep device in place if it fits comfortably.



Step 5 Adjusting flowmeter to prescribed oxygen flow rate.

7. Maintain sufficient slack on oxygen tubing and secure to patient's clothes.
8. Observe for proper function of oxygen delivery device:

(a) Nasal cannula: Cannula is positioned properly in the nares.

(b) Nonrebreathing mask: Apply mask over patient's mouth and nose to form a tight seal. The valves on the mask close, so exhaled air does not enter reservoir bag.



Step 6 Adjusting nasal cannula to fit patient and ensure comfort.

- Allows patient to turn head without dislodging nasal cannula or causing mask to shift position.
- Ensures patency of delivery device and accuracy of prescribed oxygen flow rate.
- Provides prescribed oxygen rate and reduces pressure on tips of nares.
- Does not allow exhaled air to be rebreathed. Valves on mask side ports permit exhalation but close during inhalation to prevent inhaling room air.

SKILL 38-4 Applying a Nasal Cannula or Oxygen Mask—cont'd

video

- (c) Partial rebreathing mask: Apply mask over patient's mouth and nose to form a tight seal. Ensure that the bag remains partially inflated.
- (d) Venturi mask: Apply mask over patient's mouth and nose to form a tight seal. Select appropriate flow rate.
- 9. Check cannula/mask every eight hours. Keep humidification container filled at all times.
- 10. Observe patient's nares and superior surface of both ears for skin breakdown.
- 11. Perform hand hygiene.
- 12. Verify oxygen flow rate, proper set-up, and physician's orders.
- 13. Inspect patient for relief of symptoms associated with hypoxia.
- Allows exhaled air to mix with inhaled air. Ports on the side of the mask permit most of the expired air to escape; however the bag remains partially inflated.
- Reduces buildup of carbon dioxide.
- Ensures patency of cannula/mask and oxygen flow. Prevents inhalation of dehumidified oxygen.
- Oxygen therapy can cause drying of nasal mucosa. Pressure on ears from cannula tubing or elastic can cause skin irritation.
- Reduces transmission of microorganisms.
- Ensures delivery of prescribed oxygen flow rate and patency of cannula/mask.
- Indicates that hypoxia is corrected or reduced.

Unexpected Outcomes*Worsening respiratory status**Dry nasal and upper airway mucosa**Skin breakdown over ears***Related Interventions**

- Check that oxygen delivery device is patent, not kinked, and attached to the oxygen flowmeter.
- Check oxygen level set on flowmeter; determine if delivered amount is consistent with physician order.
- If not using wall oxygen, determine if the oxygen source contains enough oxygen to deliver the prescribed oxygen amount.
- Notify physician.
- If oxygen flow rate is >4 L/minute, determine the need for humidification.
- Assess the patient's fluid status and increase fluids if appropriate.
- Provide frequent oral care.
- Obtain physician order for use of sterile nasal saline intermittently.
- Adjust tightness of elastic strap to looser level.
- Use good hygiene and skin care around the ears.
- Place soft, woven 4×4 gauze pads between elastic and ears.
- Reposition elastic strap frequently.

Recording and Reporting

- Record oxygen delivery device and litre flow in medical record. Document patient and family education. Report oxygen delivery device, litre flow, and response to changes in therapy to oncoming shift.

TABLE 38-9 Approximate FiO_2 with Different Oxygen Delivery Devices

Oxygen Delivery Device	Required Litre Flow (L/minute)	Approximate Percent Oxygen
Nasal cannula	1–2	24–28
	3–4	32–36
	5–6	40–44
Simple face mask	5–6	40
	6–7	50
	7–8	60
Venturi mask	4	24–28
	8	35–40
	12	50–60

delivered via the cannulas with a flow rate of up to 6 L/minute. Flow rates greater than 4 L/minute are not often used because of the drying effect on the mucosa and the relatively little increase in delivered oxygen concentration. Know what flow rate produces a given percentage of inspired oxygen concentration (FiO_2 ; Table 38-9). Also be alert for skin breakdown over the ears and in the nares from too tight an application of the nasal cannula.

Oxygen Masks. An oxygen mask is a device used to administer oxygen, humidity, or heated humidity. It is shaped to fit snugly over the mouth and nose and is secured in place with a strap.

The simple face mask (Figure 38-16) is used for short-term oxygen therapy. It fits loosely and delivers oxygen concentrations from 40% to 60%. The mask is contraindicated for patients with carbon dioxide retention because retention can be worsened.

The partial rebreathing mask and the non-rebreathing mask are low-flow devices with a reservoir bag (Figure 38-17). The partial rebreather mask provides an oxygen concentration of 40% to 70% with a minimum flow rate of 10 L/minute (Heuer & Scanlan, 2009, p. 874). The non-rebreather provides a high concentration of oxygen at 60% to 80% with a minimum flow rate of 10 L/minute (Heuer & Scanlan, 2009, p. 874). Oxygen flows into the reservoir bag and mask during inhalation; one-way valves on the non-rebreather mask prevent expired air from flowing back into the bag. Frequently inspect the bag to make sure it is inflated. If it is deflated, the patient may be breathing large amounts of exhaled carbon dioxide.

The Venturi mask (Figure 38-18), a high-flow device, can be used to deliver oxygen concentrations of 24% to 60% with oxygen flow rates of 4 to 12 L/minute, depending on which flow-control meter is selected (see Table 38-9). This mask



Figure 38-16 Simple face mask.



Figure 38-17 Plastic face mask with reservoir bag.

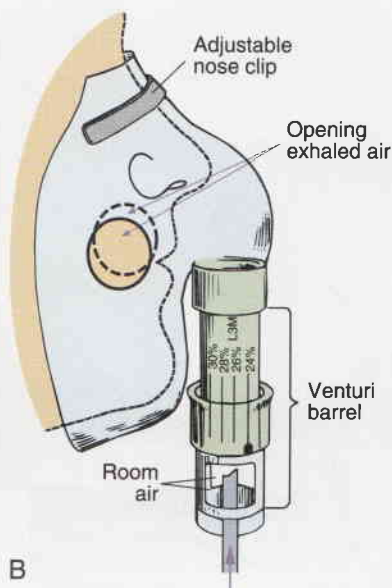


Figure 38-18 Venturi mask.

entrains room air to achieve a consistent and precise oxygen concentration. The Venturi mask is helpful for patients with COPD who require low, constant oxygen concentrations.

Home Oxygen Therapy. Indications for home oxygen therapy include a PaO_2 of 55 mm Hg or less or an SaO_2 of 88% or less on room air at rest, on exertion, or with exercise. Patients with a PaO_2 from 56 to 59 mm Hg may receive oxygen if there is also evidence of cor pulmonale, pulmonary hypertension, erythrocytosis, central nervous system dysfunction, impaired mental status, or increasing hypoxemia with exertion.

Home oxygen therapy has a beneficial effect for patients with chronic cardiopulmonary diseases (Snow et al., 2001). This therapy improves patients' exercise tolerance and fatigue levels and in some situations assists in the management of dyspnea (Fujimoto et al., 2002). When home oxygen is required, it is usually delivered by nasal cannula. When a patient has a

permanent tracheostomy, however, a T tube or tracheostomy collar is necessary. Three types of oxygen are used: compressed oxygen, liquid oxygen (Figure 38-19), and oxygen concentrators. The advantages and disadvantages (Table 38-10) of each type are assessed, along with the patient's needs and community resources, before placing a certain delivery system in the home. In the home, the major consideration is the oxygen delivery source.

Patients requiring home oxygen need extensive teaching to be able to continue oxygen therapy at home efficiently and safely (Skill 38-5). This includes oxygen safety, regulation of the amount of oxygen, and how to use the prescribed home oxygen delivery system. It is important to coordinate the efforts of the patient and family, home care nurse, home respiratory therapist, and home oxygen equipment vendor. The social worker usually assists with arranging for the home care

nurse and oxygen vendor. Assist the patient and family in learning about home oxygen and ensure their ability to maintain the oxygen delivery system.

Restoration of Cardiopulmonary Functioning. If a patient's hypoxia is severe and prolonged, cardiac arrest may result. A cardiac arrest is a sudden cessation of cardiac output and circulation. When this occurs, oxygen is not delivered to tissues, carbon dioxide is not transported from tissues, tissue metabolism becomes anaerobic, and metabolic and respiratory acidosis occurs. Permanent heart, brain, and other tissue damage occurs within four to six minutes.

Cardiopulmonary Resuscitation. Cardiac arrest is characterized by an absence of pulse and respiration. If you determine that the patient has had a cardiac arrest, **cardiopulmonary**

resuscitation (CPR) must be initiated. CPR is a basic emergency procedure of artificial respiration and manual external cardiac massage. Most nursing students are required to have successfully completed a CPR course before their clinical experiences.



Figure 38-19 Primary and portable liquid oxygen source for ambulation.

TABLE 38-10 Home Oxygen Systems

Primary Use	Advantages	Disadvantages
Compressed Gas Cylinders		
Intermittent therapy	100% oxygen, relatively inexpensive, no loss of gas during storage, relatively portable, delivery of up to 15 L/minute	Bulky, possibly unsightly, frequent refilling necessary with continuous use
Used for exercise or sleep only		
Liquid Oxygen Systems (see Figure 38-19)		
Used with active patients	100% oxygen, conveniently portable, portable units refilled at home, delivery of up to 6 L/minute	Usually weekly delivery necessary for refill, evaporates if not used, potential for frostbite at connections and if liquid is spilled
Oxygen Concentrators		
Homebound patients with limited mobility inside or outside home	Fixed monthly cost, minimal interruption of household by supplier, no refills of "main tank," most units with delivery of up to 4 or 5 L/minute	Oxygen concentration decreases as litre flow increases (usually 85%–90%), power supply needed, electric bill increase, second system needed for portability, usually E tank gas cylinders

SKILL 38-5 Using Home Oxygen Equipment

Delegation Considerations

This skill should not be delegated to nursing assistive personnel (NAP). However, once the patient is stable on home oxygen therapy, NAP may perform certain aspects of care. You are responsible for assessing the patient, checking the device set-up, and providing safe and accurate oxygen therapy. You must instruct the NAP about the following:

- Unique needs of the patient (e.g., home nasal cannula or mask) and any assistance needed in filling liquid canisters
- The type of equipment that the patient should have in the home and the oxygen flow rate
- Unexpected outcomes associated with the oxygen delivery device (e.g., increased rate of breathing, decreased level of consciousness, increased confusion, pain), and the need to inform you if any occur

Equipment

- Nasal cannula, oxygen mask, or other prescribed delivery device (see Skill 38-4)
- Oxygen tubing
- Home oxygen delivery system with appropriate equipment
- "No Smoking/Oxygen in Use" sign for each entrance to home

Continued

► SKILL 38-5 Using Home Oxygen Equipment—cont'd

Procedure

STEPS

1. While patient is in the hospital, determine patient's or family's ability to use oxygen equipment correctly. In the home setting, reassess for appropriate use of equipment.
2. Assess home environment for adequate electrical service if oxygen concentrator is used.
3. Assess patient's and family's ability to observe for signs and symptoms of hypoxia.
4. Determine appropriate resources in the community for equipment and assistance, including maintenance and repair services, and medical equipment supplier.
5. In case of power failure, determine appropriate backup system when using a compressor. Have a spare oxygen tank available.
6. Perform hand hygiene.
7. Place oxygen delivery system in a clutter-free environment that is well ventilated; away from walls, drapes, bedding, combustible materials; and at least eight feet from heat source.
8. Demonstrate steps for preparation and completion of oxygen therapy.
 - A. Compressed oxygen system
 - (1) Turn cylinder valve counterclockwise two to three turns with wrench. Store wrench with oxygen tank.
 - (2) Check cylinders by reading amount on pressure gauge.
 - B. Oxygen concentrator system
 - (1) Plug concentrator into appropriate outlet.
 - (2) Turn on power switch.
 - (3) Alarm will sound for a few seconds.
 - C. Liquid oxygen system
 - (1) Check liquid system by depressing button at lower right corner and reading the dial on the stationary oxygen reservoir or ambulatory tank.
 - (2) Collaborate with medical equipment provider to receive instruction on refilling ambulatory tank.

RATIONALE

- Physical or cognitive impairments of patient necessitate instructing a family member or significant other how to operate home oxygen equipment. Ongoing assessment enables nurse to determine specific components of skill that the patient or family easily complete.
- Oxygen concentrators require electricity to work. Continuous oxygen therapy must not be interrupted.
- Hypoxia occurs at home despite use of oxygen therapy. Worsening of a patient's physical condition or another underlying condition such as a change in respiratory status can cause hypoxia.
- Ensure readily available assistance for patients with home oxygen systems.
- Many municipalities require that patients with home oxygen equipment notify emergency medical services (EMS) before bringing the equipment home. When there is a power outage, EMS calls the home, and in some cases the home is on a priority list for having power restored.
- Reduces transmission of infection.
- Prevents injury from improper placement of oxygen equipment.
- Demonstration is reliable technique for teaching psychomotor skill (Falvo, 2004) and encourages patient to ask questions.
- Teaches psychomotor skills and enables a patient to ask questions.
- Turns on oxygen. Keep wrench available.
- Verifies adequate oxygen supply for patient use.
- Provides power source.
- Starts concentrator motor.
- Alarm turns off when desired pressure inside concentrator is reached.
- Verifies adequate oxygen supply.
- Ambulatory tanks of liquid oxygen must be filled when empty.

Critical Decision Point: Fill ambulatory tanks only when they are empty. Liquid oxygen is stored at or below -297°F inside the reservoir, and the temperature inside the ambulatory tank is warmer. If cold oxygen from the reservoir mixes with warmer oxygen left in the ambulatory tank, the ambulatory tank may malfunction.

(3) Refilling oxygen tank:

- (a) Wipe both filling connectors with a clean, dry, lint-free cloth.
 - (b) Turn off flow selector of ambulatory unit.
 - (c) Attach ambulatory unit to stationary reservoir by inserting adapter from ambulatory tank into adapter of stationary reservoir.
- Removes dust and moisture from system.
 - Secures connections.

► SKILL 38-5 Using Home Oxygen Equipment—cont'd

- (d) Open fill valve on ambulatory tank, and apply firm pressure to top of stationary reservoir (see Step 8C(3)(d) illustration). Stay with unit while it is filling. You will hear a loud hissing noise. The tank fills in about two minutes.



Step 8C(3)(d) Fill valve on ambulatory tank is open while applying firm pressure to top of ambulatory unit.

- (e) Disengage ambulatory unit from stationary reservoir when hissing noise changes and vapour cloud begins to form from stationary unit.
- (f) Wipe both filling connectors with a clean, dry, lint-free cloth.

- Prevents leaking of oxygen during filling process. If oxygen leaks during filling process, the connection between ambulatory tank and reservoir will ice up and stick together.

- Overfilling causes the ambulatory unit to malfunction from high pressure in the tank.
- Ice sometimes forms during filling. Wiping removes moisture from oxygen system.

Critical Decision Point: If ambulatory unit does not separate easily, valves from the reservoir and ambulatory unit may be frozen together. Wait until the valves warm to disengage (about 5–10 minutes). Do not touch any frosted areas because contact with skin may cause skin damage from frostbite.

9. Connect oxygen delivery device to oxygen system.
 10. Adjust to prescribed flow rate (L/min).
 11. Place oxygen delivery device on patient. Ensure patient has two sets of oxygen delivery devices and tubing.
 12. Perform hand hygiene.
 13. Instruct patient and family not to change oxygen flow rate.
 14. Guide the patient and family as they perform each step. Provide written material for reinforcement and review.
 15. Instruct the patient or family to notify physician if signs or symptoms of hypoxia or respiratory tract infection occur.
 16. Discuss emergency plan for power loss, natural disaster, and acute respiratory distress. Have patient or family call 911 and notify physician and home care agency.
 17. Instruct patient in safe home oxygen practices including placing "No Smoking/Oxygen in Use" signs at each entrance to the home, not allowing smoking in the home, keeping oxygen tanks away from open flames, and storing tanks upright.
 18. Monitor rate of oxygen delivery.
- Connects oxygen source to delivery system.
 - Ensures appropriate oxygen prescription.
 - Delivers oxygen to patient. Extra devices used when equipment is cleaned or in case of malfunction.
 - Reduces transmission of microorganisms.
 - Provides prescribed amount of oxygen. Exceeding prescribed oxygen may be harmful (e.g., COPD).
 - Allows nurse to correct errors in technique and discuss their implications.
 - Respiratory tract infections increase oxygen demand and may affect oxygen transfer from lungs to blood. They may cause severe exacerbation of patient's pulmonary disease.
 - Ensures appropriate response and can prevent worsening of patient's condition.
 - Ensures safe use of oxygen in the home and prevents injury to patient and family.
 - Determines if patient is regulating oxygen at prescribed rate.

Continued

► SKILL 38-5 Using Home Oxygen Equipment—cont'd

Unexpected Outcomes

Patient reports no oxygen flow

Unable to fill portable liquid oxygen from main source

Related Interventions

- Check tank pressure gauge. If level of oxygen is low, refill tank if portable, or provide alternative source of oxygen, such as concentrator or H cylinder.
- Notify home oxygen supplier of need for refill.
- Reassure patient and family.
- Check to see that portable tank is connected correctly.
- Determine if valve is frozen.
- Contact home oxygen supplier for service visit.
- Provide alternative oxygen source if necessary.

Recording and Reporting

- Record the patient's and family's ability to safely use the home oxygen equipment. Report the type of home oxygen equipment to be used, the patient's and family's understanding of how to use the equipment, knowledge of safety guidelines and unexpected outcomes, and ability to demonstrate proper use of the oxygen delivery device.

Emphasis is placed on ensuring that high-quality CPR is performed (Field et al., 2010, p. S643). Adequate chest compressions require that compressions be provided at the appropriate rate and depth, allowing for complete chest recoil after each compression, minimizing interruptions in compressions, and avoiding excessive ventilation (AHA, 2010; Field et al., 2010, p. S640). The newest development in the 2010 *American Heart Association Guidelines for CPR and Emergency Cardiovascular Care* is a change in the basic life support (BLS) sequence of steps from "A-B-C" (Airway, Breathing, Chest compressions) to "C-A-B" (Chest compressions, Airway, Breathing) for adults and pediatric patients (children and infants, excluding newborns) (AHA, 2010; Field et al., 2010, p. S642).

Restorative and Continuing Care

Restorative and continuing care may emphasize cardiopulmonary reconditioning as a structured rehabilitation program. **Cardiopulmonary rehabilitation** is actively helping the patient to achieve and maintain an optimal level of health through controlled physical exercise, nutrition counselling, relaxation and stress management techniques, prescribed medications and oxygen, and compliance. As physical reconditioning occurs, the patient's complaints of dyspnea, chest pain, fatigue, and activity intolerance should decrease. The patient's anxiety, depression, or somatic concerns also often decrease. The patient and the rehabilitation team define the goals of rehabilitation.

Hydration. Maintenance of adequate systemic hydration keeps mucociliary clearance normal. In patients with adequate hydration, pulmonary secretions are thin, white, watery, and easily removable with minimal coughing. Excessive coughing to clear thick, tenacious secretions is fatiguing and energy depleting. The best way to maintain thin secretions is to provide a fluid intake of 1500 to 2000 mL/day unless contraindicated by cardiac status. The colour, consistency, and ease of secretion expectoration can determine the adequacy of hydration.

Coughing Techniques. Coughing is effective for maintaining a patent airway. Coughing enables the patient to remove secretions from both the upper and lower airways. The normal series of events in the cough mechanism are deep inhalation, closure of the glottis, active contraction of the expiratory muscles, and glottis opening. Deep inhalation increases

the lung volume and airway diameter, allowing the air to pass through partially obstructing mucous plugs or other foreign matter. Contraction of the expiratory muscles against the closed glottis causes a high intrathoracic pressure to develop. When the glottis opens, a large flow of air is expelled at a high speed, providing momentum for mucus to move to the upper airways, where it can be expectorated or swallowed.

The effectiveness of coughing is evaluated by sputum expectoration, the patient's report of swallowed sputum, or clearing of adventitious sounds by auscultation. Patients with chronic pulmonary diseases, upper respiratory tract infections, and lower respiratory tract infections should be encouraged to deep-breathe and cough at least every two hours while awake. Patients with a large amount of sputum should be encouraged to cough every hour while awake and every two to three hours while asleep until the acute phase of mucus production has ended. Coughing techniques include deep breathing and coughing for the postoperative patient, cascade, huff, and quad coughing.

With the *cascade cough*, the patient takes a slow, deep breath and holds it for two seconds while contracting expiratory muscles. Then the patient opens the mouth and performs a series of coughs throughout exhalation, thereby coughing at progressively lowered lung volumes. This technique promotes airway clearance and a patent airway in patients with large volumes of sputum.

The *huff cough* stimulates a natural cough reflex and is generally effective only for clearing central airways. While exhaling, the patient opens the glottis by saying the word "huff." With practice, the patient inhales more air and may be able to progress to the cascade cough.

The *quad cough* technique is used for patients without abdominal muscle control, such as those with spinal cord injuries. While the patient breathes out with a maximal expiratory effort, the patient or nurse pushes inward and upward on the abdominal muscles toward the diaphragm, causing the cough.

Respiratory Muscle Training. Respiratory muscle training improves muscle strength and endurance, resulting in improved activity tolerance. Respiratory muscle training may prevent respiratory failure in patients with COPD.

One method for respiratory muscle training is the incentive spirometer resistive breathing device (ISRBD). Resistive breathing is achieved by placing a resistive breathing device

into a volume-dependent incentive spirometer. Muscle training is achieved when the patient uses the ISRD on a scheduled routine (e.g., twice a day for 15 minutes or four times a day for 15 minutes).

Breathing Exercises. Breathing exercises include techniques to improve ventilation and oxygenation. The three basic techniques are deep breathing and coughing exercises, pursed-lip breathing, and diaphragmatic breathing. Deep breathing and coughing exercises are routine interventions for postoperative patients (see Chapter 48).

Pursed-Lip Breathing. Pursed-lip breathing involves deep inspiration and prolonged expiration through pursed lips to prevent alveolar collapse. While the patient is sitting up, instruct the patient to take a deep breath and to exhale slowly through pursed lips, as if blowing through a straw. Have the patient blow through a straw into a glass of water to learn the technique. Patients need to gain control of the exhalation phase so that it is longer than inhalation. The patient is usually able to perfect this technique by counting the inhalation time and gradually increasing the count during exhalation. In studies using pulse oximetry as a feedback tool, patients have been able to demonstrate an increase in their arterial oxygen saturation during pursed-lip breathing.

Diaphragmatic Breathing. Diaphragmatic breathing is more difficult and requires the patient to relax intercostal and accessory respiratory muscles while taking deep inspirations. The patient concentrates on expanding the diaphragm during controlled inspiration and is taught to place one hand flat below the breastbone and above the waist, and the other hand 2 to 3 cm below the first hand. The patient is asked to inhale while the lower hand moves outward during inspiration. The patient observes for inward movement as the diaphragm ascends. These exercises are initially taught with the patient in the supine position and then practised while the patient sits and stands. The exercise is often used with the pursed-lip breathing technique.

Diaphragmatic breathing is also useful for patients with pulmonary disease, for postoperative patients, and for women in labour to promote relaxation and provide pain control. The exercise improves efficiency of breathing by decreasing air trapping and reducing the work of breathing.

❖ Evaluation

Nursing interventions and therapies are evaluated by comparing the patient's progress with the goals and expected outcomes of the nursing care plan. Evaluate the actual care given to the patient by the health care team on the basis of the expected outcomes (Figure 38-20).

Patient Care

The patient is the only one who can evaluate his or her degree of breathlessness. The patient should be asked to rate breathlessness on a scale of 1 to 10, with 1 being no shortness of breath and 10 being severe shortness of breath. Arterial blood gas levels, pulmonary function tests, vital signs, ECG tracings, and physical assessment data provide objective measurement of the success of therapies and treatments. Outcomes are compared with expected outcomes to determine the patient's health status. Continuous evaluation helps to determine whether new or revised therapies are required and if new nursing diagnoses have developed and require a new plan of care.

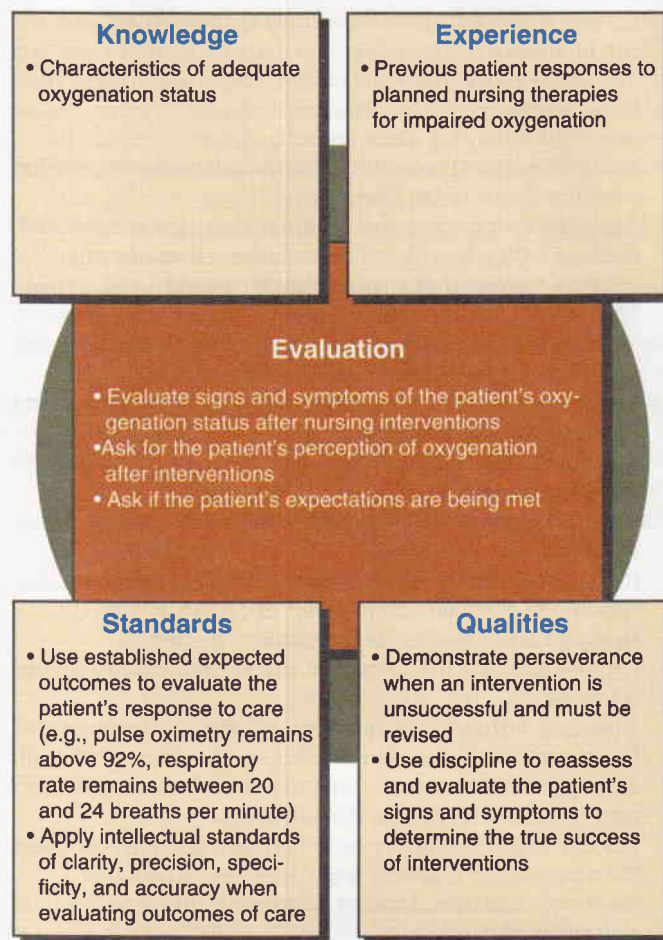


Figure 38-20 Critical thinking model for oxygenation evaluation.

When nursing measures directed to improve oxygenation are unsuccessful, immediately modify the nursing care plan. Do not hesitate to notify the physician about a patient's deteriorating oxygenation status. Prompt notification can avoid an emergency situation or even the need for CPR.

Patient Expectations

It is important to ask patients if their expectations of care have been met. For example, you can ask the patient, "Do you feel like you will be able to use the breathing techniques we have practised at home?" If the patient does not think this will work at home, then the patient's expectations for care management have not been met.

You should ask the patient whether all questions and needs have been met. If not, spend more time understanding what the patient wants and needs to meet his or her expectations. Working closely with the patient will enable you to redefine those patient expectations that can be realistically met within the limitations of the patient's condition and treatment.

❖ KEY CONCEPTS

- The primary function of the heart is to deliver deoxygenated blood to the lungs for oxygenation and to deliver oxygen and nutrients to the tissues.
- Preload, afterload, contractility, and heart rate alter cardiac output.

- Cardiac dysrhythmias are classified by cardiac activity and site of impulse origin.
- The primary function of the lungs is to transfer oxygen from the atmosphere into the alveoli and to transfer carbon dioxide out of the body as a waste product.
- Ventilation is the process of providing adequate oxygenation from the alveoli to the blood.
- Compliance, or the ability of the lungs to expand and contract, depends on the function of musculoskeletal and neurological systems and on other physiological factors.
- The process of inspiration (active process) and expiration (passive process) is caused by changes in intrapleural and intra-alveolar pressures and lung volumes.
- Respiration is controlled by the central nervous system and by chemicals within the blood.
- Decreased hemoglobin levels alter the patient's ability to transport oxygen.
- Impaired chest wall movement reduces the level of tissue oxygenation.
- Hyperventilation is a respiratory rate greater than that required to maintain normal levels of carbon dioxide.
- Hypoventilation causes carbon dioxide retention.
- Hypoxia occurs if the amount of oxygen delivered to tissues is too low.
- The health history and assessment includes information about the patient's cough, dyspnea, fatigue, wheezing, chest pain, environmental exposures, respiratory infection, cardiopulmonary risk factors, and use of medications.
- Diagnostic and laboratory tests may be needed to complete the database for a patient with decreased oxygenation.
- Breathing exercises improve ventilation, oxygenation, and sensations of dyspnea.
- Nebulization delivers small drops of water or particles of medication to the airways.
- Chest physiotherapy includes postural drainage, percussion, and vibration to mobilize pulmonary secretions.
- Coughing and suctioning techniques are used to maintain a patent airway.
- Oxygen therapy is used to improve levels of tissue oxygenation and is delivered by a nasal cannula, various oxygen masks, or the use of an artificial airway.

✦ CRITICAL THINKING EXERCISES

1. Ms. Delgado is a 56-year-old postmenopausal woman with a history of hypertension. She presents to her primary care office with complaints of nausea, indigestion, increased fatigue, and shortness of breath with increased activity for the past 16 hours. What questions would you ask Ms. Delgado in the nursing health history?
2. Mr. Kwan has recently immigrated to Canada. He comes to the clinic because he has been increasingly fatigued, has a persistent cough, has been losing weight, and awakens at night with sweats. What questions would be important to ask when completing the nursing health history?
3. Mrs. Leblanc, age 45 years, has been admitted to the hospital with community-acquired pneumonia. She has a productive cough, fever, chills, crackles and wheezes on auscultation of her chest, and a heart rate of 104 beats per minute. What nursing diagnosis would you consider for this patient? What nursing interventions would be appropriate for her? What health promotion interventions need to be initiated before discharge from the hospital?
4. Mr. Chen Lee, age 72 years, is on a medical unit for a recent diagnosis of COPD. He uses his call bell to indicate that he feels short of breath. His respiratory rate is 32 breaths per minute and oxygen saturation is 86% on room air. What immediate nursing interventions would you initiate?

✦ REVIEW QUESTIONS

1. Patients with anemia may complain of
 1. Fatigue
 2. Increased activity tolerance
 3. Decreased breathlessness
 4. Increased appetite
2. The most common toxic inhalant that decreases the oxygen-carrying capacity of blood is
 1. Carbon dioxide
 2. Carbon monoxide
 3. Nitrogen
 4. Mustard gas
3. Conditions such as shock and severe dehydration resulting from extracellular fluid loss and reduced circulating blood volume cause
 1. Hypovolemia
 2. Hypervolemia
 3. Uncontrolled bleeding
 4. Hypoxia
4. Fever increases the tissues' need for oxygen, and as a result
 1. Carbon dioxide decreases
 2. Cyanosis occurs
 3. Carbon dioxide increases
 4. Muscle mass increases
5. Left-sided heart failure is an abnormal condition characterized by
 1. Impaired functioning of the left ventricle
 2. Impaired functioning of the left atrium
 3. Lowered cardiac pressures
 4. Increased cardiac output
6. Right-sided heart failure results from
 1. Impaired functioning of the right ventricle
 2. Impaired functioning of the right atrium
 3. Severe weight loss
 4. Lowered pulmonary vascular resistance
7. Cyanosis, the blue discoloration of the skin and mucous membranes caused by the presence of desaturated hemoglobin in capillaries, is a(an)
 1. Early sign of hypoxia
 2. Late sign of hypoxia
 3. Reliable measure of oxygenation status
 4. Non-life-threatening event
8. A person who starts smoking in adolescence and continues to smoke into middle age
 1. Has an increased risk for cardiopulmonary disease and lung cancer
 2. Has an increased risk for obesity and diabetes
 3. Has an increased risk for stress-related illnesses
 4. Has an increased risk for alcoholism

9. A simple and cost-effective method for reducing the risks of stasis of pulmonary secretions and decreased chest wall expansion is
 1. Oxygen humidification
 2. Chest physiotherapy
 3. Frequent changes of position
 4. Anti-infectives
10. The most effective position for patients with cardiopulmonary diseases is the
 1. Supine position
 2. Prone position
 3. High Fowler's
 4. 45-degree semi-Fowler's
11. A patient has a suspected tension pneumothorax following the insertion of a chest tube. What action is considered a nursing priority?
 1. Assess the chest tube to ensure it is not clamped or occluded.
 2. Cross-clamp the chest tube close to the patient's chest.
 3. Change the dressing using non-occlusive material.
 4. Instruct the patient to deep-breathe and cough.
12. Which of the following statements best describes the correct method for artificial airway suctioning?
 1. Use clean gloves to complete the procedure.
 2. Insert the catheter 1-2 cm during expiration.
 3. Lightly coat 2-3 cm of catheter with water-soluble lubricant.
 4. Apply intermittent suction while withdrawing the catheter.

✦ RECOMMENDED WEB SITES

Canadian Lung Association: <http://www.lung.ca/>

The Canadian Lung Association is the umbrella group for the 10 provincial lung associations. Its goal is to promote research, education, and healthy living in order to combat lung disease.

Health Canada—Cardiovascular Disease Division: <http://www.hc-sc.gc.ca/hc-ps/dc-ma/index-eng.php>

This Web site for Health Canada provides links, information, and resources on the topic of cardiovascular health.

Heart and Stroke Foundation of Canada: <http://www.heartandstroke.ca>

The Heart and Stroke Foundation is a national voluntary, non-profit organization whose mission is to improve the health of Canadians by preventing heart disease and stroke through research, health promotion, and advocacy.

Review Question Answers

1. 1; 2. 2; 3. 1; 4. 3; 5. 1; 6. 1; 7. 2; 8. 1; 9. 3; 10. 4; 11. 1; 12. 4

Rationales for the Review Questions appear at the end of the book.

Sample

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Fluid, Electrolyte, and Acid-Base Balances

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objectives

Mastery of content in this chapter will enable you to:

- Define the key terms listed.
- Describe the distribution, composition, movement, and regulation of body fluids.
- Describe the regulation and movement of major electrolytes.
- Describe the processes involved in acid-base balance.
- Identify factors that affect normal fluid, electrolyte, and acid-base balances.
- Discuss the clinical assessments for fluid, electrolyte, and acid-base balances.
- Describe laboratory studies associated with fluid, electrolyte, and acid-base balances.
- Identify and discuss nursing interventions for patients with fluid, electrolyte, and acid-base imbalances.
- Discuss the purpose of and procedure for initiating, maintaining, and discontinuing peripheral vascular access devices.
- Discuss the purpose and nursing care related to central vascular access devices, including preventing and recognizing associated complications.
- Calculate the intravenous flow rate.
- Discuss complications associated with intravenous therapy.
- Discuss the purpose of and procedure for initiating a blood transfusion and interventions to manage transfusion reaction.

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key terms

- Active transport, p. 938
- Aldosterone, p. 940
- Anion gap, p. 945
- Anions, p. 937
- Antidiuretic hormone (ADH), p. 940
- Arterial blood gas (ABG), p. 942
- Autologous transfusion, p. 986
- Base excess, p. 945
- Buffer, p. 941
- Carrier-mediated transport, p. 938
- Cations, p. 937
- Central vascular access devices (CVADs), p. 959
- Colloids, p. 958
- Colloid osmotic pressure, p. 938
- Concentration gradient, p. 938
- Crystalloid, p. 958
- Dehydration, p. 940
- Diffusion, p. 938
- Edema, p. 938
- Electrolytes, p. 937
- Electronic infusion devices (EIDs), p. 973
- Extracellular fluid (ECF), p. 937
- Facilitated diffusion, p. 938
- Filtration, p. 938
- Fluid volume deficit (FVD), p. 947
- Fluid volume excess (FVE), p. 958
- Hemolysis, p. 986
- Homeostasis, p. 938
- Hydrostatic pressure, p. 938
- Hypercalcemia, p. 942
- Hyperchloremia, p. 942
- Hyperkalemia, p. 942
- Hypermagnesemia, p. 942
- Hypernatremia, p. 942
- Hypertonic, p. 971
- Hypocalcemia, p. 942
- Hypochloremia, p. 942
- Hypokalemia, p. 942
- Hypomagnesemia, p. 942
- Hyponatremia, p. 942
- Hypotonic, p. 971
- Hypovolemia, p. 939
- Infiltration, p. 985
- Insensible water loss, p. 939
- Interstitial fluid, p. 937
- Intracellular fluid (ICF), p. 937
- Intravascular fluid, p. 937
- Ions, p. 937
- Isotonic, p. 971
- Metabolic acidosis, p. 945
- Metabolic alkalosis, p. 945
- Osmolality, p. 939
- Osmolarity, p. 971
- Osmoreceptors, p. 939
- Osmosis, p. 938
- Osmotic pressure, p. 938
- Oxygen saturation, p. 944
- Peripheral vascular access devices (PVADs), p. 959
- Phlebitis, p. 985
- Respiratory acidosis, p. 945
- Respiratory alkalosis, p. 945
- Sensible water loss, p. 939
- Solutes, p. 937
- Solution, p. 937
- Solvent, p. 937
- Total parental nutrition (TPN), p. 958
- Transcellular fluid, p. 937
- Transfusion reaction, p. 985
- Vascular access devices (VADs), p. 959

media resources

Fluid, electrolyte, and acid-base balances within the body are essential for normal body function (Box 39-1). These balances are maintained by ingestion, distribution, and excretion of water and electrolytes and by respiration. Within the body, these balances are maintained by the renal, pulmonary, and buffer systems. Imbalances may be caused by many factors, including altered intake, illness, or excessive losses, such as exercise-induced diaphoresis. These imbalances affect physiological processes at the cellular, tissue, and system levels of the body; therefore, understanding the mechanisms that contribute to fluid, electrolyte, and acid-base balances is essential to nursing practice.

Scientific Knowledge Base

Water is the largest single component of the body. The average adult's weight is 60% fluid; however, this amount varies with age, gender, and weight. A healthy, mobile, well-oriented adult can usually maintain normal fluid, electrolyte, and acid-base balances with renal, hormonal, and neural functions (McCance & Huether, 2010, p. 96).

BOX 39-1 NURSING STORY

Harold's Waterworks

Susanne Walter works on a medical unit in a small city. One evening, Harold Short, aged 75, was admitted to Susanne's unit after his friends found him weak and confused at home after not showing up to his weekly bridge club meeting. Harold had been managing well on his own, still caring for his home and garden with only occasional assistance with heavy jobs from his son. Harold's wife passed away four years previously. Harold was known to his physician but rarely made appointments. Over the fall, Harold's friends had noted that he complained about problems with his "waterworks" but was otherwise well.

On Susanne's initial assessment, she concluded that Harold had been minimizing his fluid intake to avoid having to get up "every 10 minutes" at night. Over the 24 hours before admission, he had not been able to get out of his bedroom because of weakness and "the other people rambling around." Susanne observed that Harold had moments of uncharacteristic confusion during his interview. Susanne assessed Harold's venous filling because she was aware that assessing skin turgor is less reliable in older adults. His blood pressure was low, and his heart rate was elevated. His laboratory tests revealed hypernatremia (sodium 148 mmol/L) with elevated blood urea nitrogen (18.0 mmol/L) and creatinine (130 mmol/L). Susanne palpated a distended bladder, conducted a bladder scan, and determined that Harold had urinary retention, which led him to avoid fluids.

After Harold was catheterized and treated with intravenous and oral fluid, his blood work and mental status returned to normal. Susanne cared for Harold over four shifts and developed a therapeutic nurse-patient relationship. Before Harold's discharge, Susanne educated Harold about the importance of fluid intake for his well-being and to drink more fluids earlier in the day to avoid having to get up as often at night. She also educated Harold's family and friends regarding how to support Harold to increase his fluid intake during the day, in addition to the signs and symptoms of fluid and electrolyte imbalances. Susanne advocated for a urology consultation regarding Harold's urinary retention. Although Harold refused to "carry around a drinking bottle like those young folks," he expressed clear understanding regarding his fluid and electrolyte health.

Distribution of Body Fluids

Body fluids are distributed in two distinct compartments, one containing intracellular fluid and the other containing extracellular fluid. **Intracellular fluid (ICF)** comprises all fluid within body cells, accounting for approximately 66% of total body water and 40% of body weight (McCance & Huether, 2010, p. 97).

Extracellular fluid (ECF), all the fluid outside cells, is divided into three smaller compartments: interstitial fluid, intravascular fluid, and transcellular fluids. **Interstitial fluid**, including lymph, is the fluid between the cells and outside the blood vessels. **Intravascular fluid** is blood plasma. **Transcellular fluid**, separated from other fluid by epithelium, includes cerebrospinal, pleural, peritoneal, and synovial fluids and the fluids in the gastrointestinal tract (McCance & Huether, 2010, p. 97).

Composition of Body Fluids

Electrolytes are important **solutes** in all body fluids. An electrolyte, when dissolved in an aqueous solution, separates into **ions** and is able to carry an electrical current (Martini & Nath, 2009). Positively charged electrolytes are **cations** (e.g., sodium $[Na^+]$, potassium $[K^+]$, calcium $[Ca^{2+}]$). Negatively charged electrolytes are **anions** (e.g., chloride $[Cl^-]$, bicarbonate $[HCO_3^-]$, sulphate $[SO_4^{2-}]$). Electrolytes are vital to many body functions.

The body carefully regulates electrolyte concentration (Table 39-1). The value millimoles per litre (mmol/L) represents the amount of the specific electrolyte (solute) dissolved in a litre of fluid (**solution**). The solution in which a solute is dissolved is called a **solvent**. Electrolyte concentration within fluid compartments is influenced by electrical charge. During normal physiological processes, ions are exchanged for other ions with the same electrical charge.

Electrolytes are ingested, often in the form of bulk and trace minerals or salts, and then utilized for basic physiological processes, stored for future use, or excreted. These electrolytes are important for maintaining osmotic concentrations in body fluids. They are also necessary for enzyme reactions, nerve impulses, muscle contraction, and metabolism. In addition, some minerals contribute to the regulation of hormone production and strengthening of skeletal structures.

► TABLE 39-1

Electrolyte Concentration in Extracellular Fluid (Serum Levels)

Electrolyte	Extracellular Fluid Concentration (mmol/L)
Sodium (Na^+)	136–145
Potassium (K^+)	3.5–5.0
Calcium (Ca^{2+})	2.25–2.75
Bicarbonate (HCO_3^-)	22–26 (arterial), 24–30 (venous)
CO_2	23–30 (venous)
Chloride (Cl^-)	98–106
Magnesium (Mg^{2+})	0.65–1.05
Phosphate (PO_4^{3-})	0.97–1.45

Data from Pagana, K. D., & Pagana, T. (2010). *Mosby's Manual of Diagnostic and Laboratory Tests* (4th ed.). St Louis, MO: Mosby.

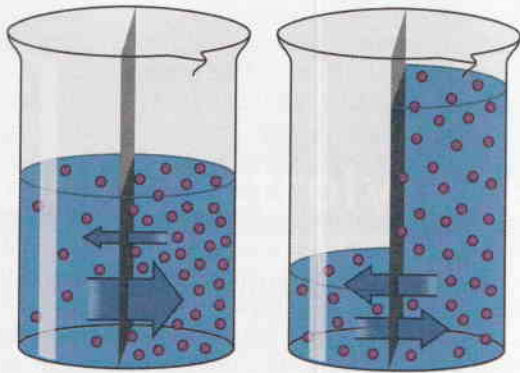


Figure 39-1 Osmosis: Water moving across a semipermeable membrane.

Movement of Body Fluids

Fluids and electrolytes constantly shift between compartments to facilitate body processes such as tissue oxygenation, acid–base balance, and urine formation. Because cell membranes separating the body fluid compartments are selectively permeable, water can pass through them easily. However, most ions and molecules pass through them more slowly. Fluids and solutes move across these membranes by four processes: osmosis, diffusion, filtration, and carrier-mediated transport.

Osmosis. Osmosis is the movement of water through a semipermeable membrane from an area of lesser solute concentration to an area of greater solute concentration in an attempt to equalize concentrations on both sides of the membrane (Figure 39-1). A semipermeable membrane allows water to pass through while remaining impermeable to most solutes. The rate of osmosis depends on the concentration of the solutes in the solution, temperature of the solution, electrical charges of the solutes, and differences between the osmotic pressures exerted by the solutions. The concentration of a solution is measured in osmols, which reflect the amount of a substance in solution in the form of molecules, ions, or both. One example of osmosis is the action of osmotic laxatives. These laxative salts are poorly absorbed through the intestinal lining and therefore draw water into the intestinal lumen, causing an accumulation of water and therefore softened stool. The swelling also stretches the intestine, stimulating peristalsis (Lehne, 2010).

Osmotic pressure is the pressure needed to counter the movement of water (solvent) across a semipermeable membrane from a low concentration to high concentration of solutes. A solution with a high solute concentration has a high osmotic pressure and draws water into itself. If the concentration of the solute is greater on one side of the semipermeable membrane, the rate of osmosis is faster, and solvent rapidly transfers across the membrane. This continues until equilibrium is reached.

Plasma proteins affect the blood's osmotic pressure. The three main classes of plasma proteins are albumins, globulins, and fibrinogen (Martini & Nath, 2009). Because albumin, produced in the liver, makes up the greatest proportion of plasma proteins, it exerts **colloid osmotic pressure** or oncotic pressure. This oncotic pressure tends to keep fluid in the intravascular compartment by pulling water from the interstitial space back into the capillaries.

Diffusion. Diffusion is the movement of ions and molecules in a solution across a semipermeable membrane from an

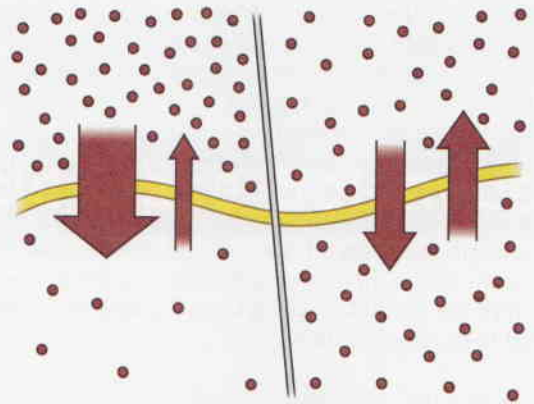


Figure 39-2 Diffusion: Particles moving across a semipermeable membrane from high concentration to lower concentration.

area of higher concentration to an area of lower concentration (Figure 39-2). The result is an even distribution of the solute in a solution. The rate of diffusion is affected by the molecule size, concentration, and temperature of a solution. The larger the molecule is and the cooler the solution is, the slower the rate of diffusion is. The difference between the two concentrations is known as a **concentration gradient**. Perfume permeating a room and a drop of food colouring moving through a glass of water are common examples of diffusion. A physiological example is the movement of oxygen (O_2) and carbon dioxide (CO_2) between the alveoli and blood vessels in the lungs.

Filtration. Filtration is the process by which water and diffusible substances move together in response to fluid pressure, moving from an area of higher pressure to one of lower pressure. This process is active in capillary beds, where **hydrostatic pressure** differences determine the movement of water (Figure 39-3). Problems occur when hydrostatic pressure is increased on the venous side of the capillary bed, as occurs in heart failure. The normal movement of water from the interstitial space into the intravascular space by filtration is then reversed. This results in an accumulation of excess fluid in the interstitial space, known as **edema**. Filtration is also very important for urine formation as water and solutes are carried across the wall of the glomerular capillaries by hydrostatic or blood pressure. Falling blood pressure affects this process.

Carrier-Mediated Transport. Carrier-mediated transport moves molecules across the plasma membrane. This process may be active or passive. **Facilitated diffusion** and **active transport** are two examples of carrier mediate transport. When insulin, a carrier protein, binds to glucose, it is able to carry it across the cell membrane. This is an example of facilitated diffusion. Active transport requires energy to move materials across cell membranes against a concentration gradient. The sodium-potassium pump is an example of active transport (Figure 39-4).

Regulation of Body Fluids

Body fluids are regulated by fluid intake, hormonal controls, and fluid output, in order to maintain **homeostasis**. Homeostasis, is essential for survival (Clancy & McVicar, 2007b). In health, the body is able to respond to changes in the ECF. The primary hormones that regulate fluid are antidiuretic hormone, aldosterone, and natriuretic peptides (Martini & Nath, 2010, p. 871).

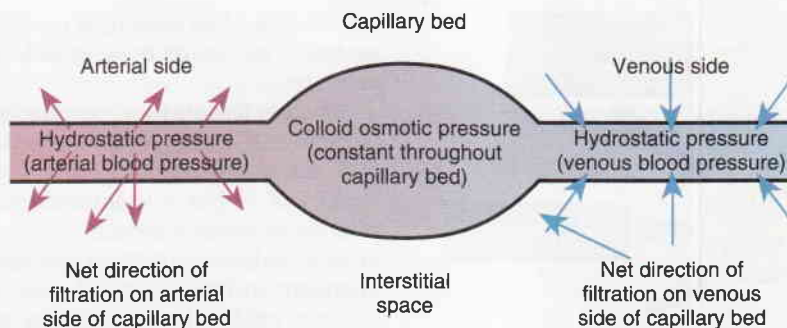


Figure 39-3 An example of filtration and hydrostatic pressure.

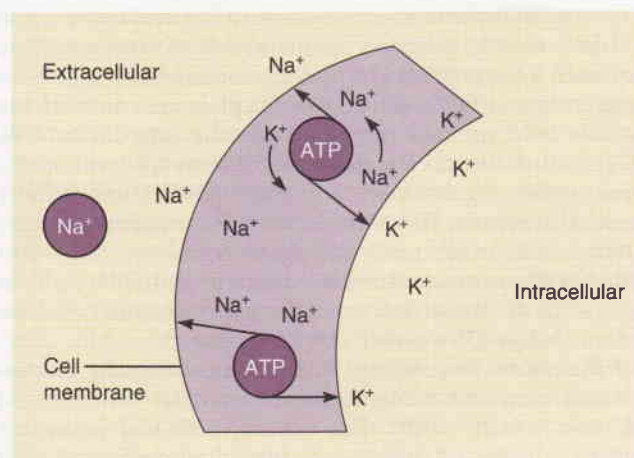


Figure 39-4 The sodium–potassium pump. As sodium diffuses into the cell and potassium is pumped out of the cell, active transport delivers sodium back to the extracellular compartment and potassium back to the intracellular compartment. *ATP*, adenosine triphosphate.

Source: Lewis, S. L., Heitkemper, M. M., Dirksen, S. R., O'Brien, P. G., & Bucher, L. (2007). *Medical-surgical nursing: Assessment and management of clinical problems* (7th ed., p. 317, Fig. 17-5). St Louis, MO: Mosby.

Fluid Output Regulation. Fluid output occurs through four organs of water loss: the kidneys, the skin, the lungs, and the gastrointestinal tract. The kidneys are the major regulatory organs of fluid balance. They receive approximately 180 L of plasma to filter each day and produce 1200 to 1500 mL of urine (Table 39-2).

Insensible water loss is continuous, gradual movement of water from the respiratory and skin epitheliums, amounting to about 20 to 25 mL/hour (Martini & Nath, 2009). The lungs expire about 400 mL of water daily, whereas insensible skin perspiration losses are approximately 600 mL/day. This insensible water loss may increase in response to changes in respiratory rate and depth. In addition, devices for giving oxygen can increase insensible water loss from the lungs.

Fever may increase insensible water loss. Visible or **sensible water loss** from the skin varies greatly depending on the sweat glands. Water loss from the skin is regulated by the sympathetic nervous system, which activates sweat glands.

The gastrointestinal tract plays a vital role in fluid regulation. Every day, approximately 8 L of fluid is moved into the gastrointestinal tract and then returns to the ECF (Day et al., 2010). Of the 3 to 6 L that the average adult loses each day, only

TABLE 39-2

Adult Average Daily Fluid Gains and Losses

Type of Fluid	Change (mL)
Fluid Gains	
Oral fluids	1100–1400
Solid foods	800–1000
Metabolism	300
Total gains	2200–2700
Fluid Losses	
Kidneys	1200–1500
Skin	500–600
Lungs	400
Gastrointestinal tract	100–200
Total losses	2200–2700

100 to 200 mL is lost through the feces, under normal conditions, because most of the fluid is reabsorbed in the small intestine. However, in the presence of a disease process, diarrhea for example, the gastrointestinal tract may become the site of a large amount of fluid loss. This loss may have a significant impact on maintaining normal fluid regulation.

Fluid Intake Regulation. Fluid intake is regulated primarily through the thirst mechanism. The thirst control centre is located within the brain's hypothalamus. Thirst is one of the major factors that determines fluid intake. **Osmoreceptors** continually monitor the serum osmotic pressure, and when **osmolality** increases, nerves cells in the subfornical organ (SFO) and hypothalamus are stimulated (Patton & Thibodeau, 2010). An increase in plasma sodium increases the osmotic pressure and stimulates the thirst mechanism. Increased plasma osmolality can occur with any condition that interferes with the oral ingestion of fluids or with the intake of hypertonic fluids. The thirst centre will also be stimulated when excess fluid is lost and **hypovolemia** occurs, as in excessive vomiting and hemorrhage. In addition, stimulation of the renin–angiotensin–aldosterone mechanism, potassium depletion, psychological factors, and oropharyngeal dryness initiate the sensation of thirst (Figure 39-5).

The average adult's fluid intake is about 2200 to 2700 mL per day; oral intake accounts for 1100 to 1400 mL, solid foods for about 800 to 1000 mL, and oxidative metabolism for 300 mL daily. Patients must be in an alert state to maintain their fluid intake independently. Infants, patients with neurological or psychological problems, and some older adults who are unable

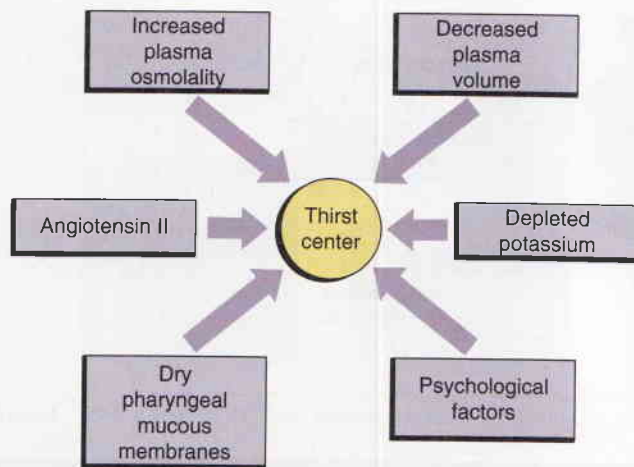


Figure 39-5 Stimuli affecting the thirst mechanism.

to perceive or respond to the thirst mechanism are at risk for dehydration.

Hormonal Regulation. Antidiuretic hormone (ADH) is stored in the posterior pituitary gland and is released in response to changes in blood osmolality. The osmoreceptors in the hypothalamus are stimulated to release ADH when the osmolality increases. ADH promotes water conservation by acting directly on the renal tubules and collecting ducts to make them more permeable to water. This, in turn, causes water to return to the systemic circulation, which dilutes the blood and decreases its osmolality. As the body attempts to compensate, the patient will experience a temporary decrease in urinary output. When the blood has been sufficiently diluted, the osmoreceptors stop the release of ADH and urinary output is restored. ADH also stimulates the thirst centre to promote fluid intake.

Aldosterone is released by the adrenal cortex in response to increased plasma potassium or falling sodium levels or as part of the renin–angiotensin–aldosterone system to counteract hypovolemia. To resolve hypovolemia, renin is released from the kidney in response to sympathetic nervous system stimulation and decreased renal blood flow, initiating a cascade of physiological and endocrine processes, one of which is the release of aldosterone. Aldosterone acts on the distal portion of the renal tubule to increase the reabsorption (saving) of sodium and the secretion and excretion of potassium and hydrogen.

Natriuretic peptides respond to increases in circulating blood volume. They are released from cardiac muscle cells and act on the peripheral vasculature, other hormones, and the kidney to facilitate diuresis. Natriuretic peptides increase sodium excretion and fluid loss while reducing thirst and blocking the release of ADH and aldosterone.

Regulation of Electrolytes

For normal cell function and human well-being, the body maintains a normal balance of electrolytes in the ECF and ICF in spite of changes in intake and loss. This is accomplished primarily through regulation of absorption in the gastrointestinal tract and of excretion through the kidneys. Although fluid and electrolyte balances are inextricably linked, it is important to explore electrolyte balance separately.

Cations. Major cations within the body fluids are sodium, potassium, calcium, and magnesium (Mg^{2+}). Cations

interchange when one cation leaves the cell and is replaced by another. This occurs because cells tend to maintain electrical neutrality.

Sodium Regulation. Sodium is the most abundant cation (90%) in ECF and therefore exerts the greatest influence on the ECF osmotic concentration and water balance. Normally, the intake and output of sodium is between 1.2 g and 3.3 g daily. With an increase in sodium intake, and therefore an increase in ECF sodium content, water enters the ECF by osmosis. Therefore, increased sodium intake results in increased blood volume rather than significant changes in ECF sodium concentration.

The body continually responds to small changes in sodium content. Excessive perspiration and oral intake of water, for example, result in high sodium loss. When this occurs, ADH is reduced in order to maintain homeostasis, and water excretion increases in order to maintain osmotic concentration. However, if the regulation of sodium concentration requires a large change in ECF volume, baroreceptors are stimulated to regulate fluid volumes and blood pressure (Martini & Nath, 2009). Sodium ions are also major contributors to nerve impulse transmission, regulation of acid–base balance, and cellular chemical reactions. The normal extracellular sodium concentration is 136 to 145 mmol/L (Pagana & Pagana, 2010). Sustained or severe problems with sodium concentration result in high sodium, above 145 mmol/L (hypernatremia), or low sodium, below 135 mmol/L (hyponatremia).

Potassium Regulation. Potassium is the major electrolyte and principal cation in the intracellular compartment (Martini & Nath, 2009). The majority (98%) of potassium content is in the ICF. Because the potassium concentration of ECF is relatively low, the cells expend energy to maintain the potassium content of ICF. Potassium is regulated by dietary intake and strongly affected by aldosterone. Extracellular potassium concentration is affected by many complex mechanisms, including those of dietary intake and renal excretion. Renal excretion is regulated by changes in potassium concentration, changes in the acidity or alkalinity of a fluid (pH measurements), sodium reabsorption, and aldosterone levels (Martini & Nath, 2009). The body conserves potassium poorly, so any condition that increases urine output decreases the serum potassium concentration.

Potassium regulates many metabolic activities and is necessary for glycogen deposits in the liver and skeletal muscle, transmission and conduction of nerve impulses, normal cardiac conduction, and skeletal and smooth muscle contraction. The normal range for serum potassium concentrations is 3.5 to 5 mmol/L.

Calcium Regulation. Calcium is stored in bone, plasma, and body cells. Ninety-nine percent of calcium is located in bone, and only 1% is located in ECF. Approximately 50% of calcium in the plasma is bound to protein, primarily albumin, and 40% is free ionized calcium. The remaining small percentage is combined with nonprotein anions such as phosphate (PO_4^{3-}), citrate, and carbonate (Martini & Nath, 2010). Normal serum ionized calcium is 1.0 to 1.2 mmol/L. Normal total calcium is 2.25 to 2.75 mmol/L. Calcium is necessary for bone and teeth formation, blood clotting, hormone secretion, cell membrane integrity, cardiac conduction, transmission of nerve impulses, and muscle contraction.

Magnesium Regulation. Magnesium, the second most abundant intracellular cation, is essential for many intracellular activities, such as enzyme reactions. Magnesium, with a

plasma concentration of 0.65 to 1.05 mmol/L, is important for bone structure and neuromuscular function, including skeletal and cardiac muscle excitability. Serum magnesium is regulated by dietary intake, renal mechanisms, and actions of the parathyroid hormone.

Anions. The three major anions of body fluids are chloride, bicarbonate, and phosphate ions.

Chloride Regulation. Chloride is the major anion in ECF. The transport of chloride follows sodium. Normal concentrations of chloride range from 97 to 107 mmol/L. Serum chloride is regulated by dietary intake and the kidneys. A person with normal renal function who has a high chloride intake will excrete a higher amount of urine chloride.

Bicarbonate Regulation. Bicarbonate is the major chemical base buffer within the body. The bicarbonate ion is found in ECF and ICF. The bicarbonate ion is an essential component of the carbonic acid–bicarbonate buffering system, which is essential to acid–base balance. The kidneys regulate bicarbonate. Normal arterial bicarbonate levels range between 22 and 26 mmol/L; venous bicarbonate is measured as carbon dioxide content, and the normal value is 24 to 30 mmol/L.

Phosphate Regulation. Phosphorus is the major anion in the ICF; however, nearly all the phosphorus in the body exists in the form of phosphate. Phosphate's most important role is within the ICF, where it assists in the formation of high-energy compounds, such as adenosine triphosphate (ATP) and nucleic acids, and in enzyme activity. Similar to magnesium and calcium, phosphate is used and stored in the skeleton. It also functions with calcium to develop and maintain teeth. Calcium and phosphate are inversely proportional; if one rises, the other falls. Phosphate also assists in acid–base regulation, promotes normal neuromuscular action, and participates in carbohydrate metabolism. Phosphate is normally absorbed through the gastrointestinal tract and is regulated by dietary intake, renal and intestinal excretion, and parathyroid hormone. The normal serum phosphorus level is 0.9 to 1.45 mmol/L.

Regulation of Acid-Base Balance

Acid–base balance exists when the rate at which the body produces and gains acids or bases, through cellular metabolism and gastrointestinal absorption, equals the rate at which acids or bases are excreted.

This balance results in a stable concentration of hydrogen ions (H^+) in body fluids that is expressed as the pH value. Hydrogen ions are primarily excreted by the kidneys. A normal hydrogen ion level is necessary to maintain cell membrane integrity and the speed of cellular enzymatic actions.

Arterial blood pH is inversely proportional to the hydrogen ion concentration (i.e., the greater the concentration, the more acidic the solution is and the lower the pH is; the lower the concentration, the more alkaline the solution is and the higher the pH is). The pH is also a reflection of the balance between carbon dioxide, which is regulated by the lungs, and bicarbonate, a base regulated by the kidneys. Normal pH is maintained by chemical buffers, and buffer systems and regulatory mechanisms in the kidneys and lungs. A **buffer** is a substance or group of substances that can absorb or release hydrogen ions to stabilize pH, such as bicarbonate, phosphate, and proteins. Whereas the chemical buffers act immediately, the response by the kidneys may take minutes, and the response in the lung much longer.

Buffers. Buffer systems are combinations of a weak acid and a weak base and are the short-term regulators of acid–base

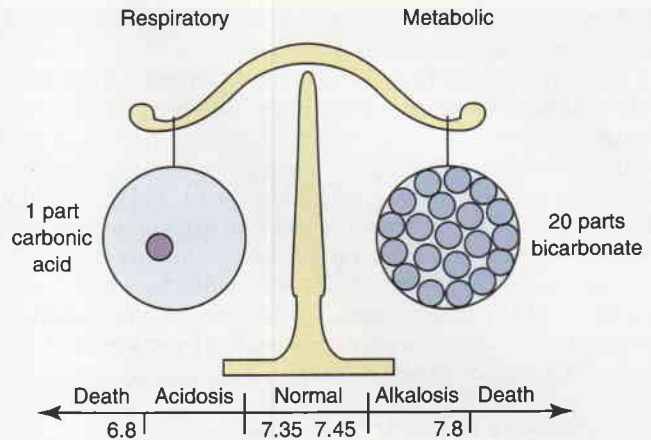
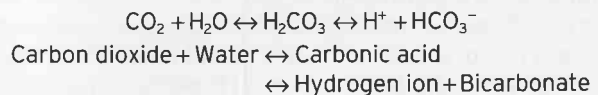


Figure 39-6 Carbonic acid-to-bicarbonate ratio and pH.

balance. The four main types of buffer systems are protein (amino acids, plasma proteins), hemoglobin (also a protein but unique in its buffering role), carbonic acid (H_2CO_3) and bicarbonate, and phosphate. Other types are the ammonia buffer system, a complex system that occurs in ICF, and the tubular system in the kidneys. All these buffers bind hydrogen ions until they can be permanently removed through the regulatory mechanisms in the lungs and the kidneys.

The carbonic acid–bicarbonate buffer system (Figure 39-6) is used to evaluate acid–base balance, using the arterial blood gas (ABG) test. This system can be expressed as the following:



The carbonic acid–bicarbonate buffer system is the principal buffering system to react to change in the pH of ECF, and it reacts within seconds. Whenever carbon dioxide increases, an increase in hydrogen ions results, and whenever hydrogen ions are produced, more carbon dioxide results (Clancy & McVicar, 2007a). The lungs control the excretion of carbon dioxide, and the kidneys control the excretion of hydrogen and bicarbonate ions.

Another buffer system is the hemoglobin–oxyhemoglobin system within red blood cells (RBCs). This buffer system can have an immediate effect on pH because carbon dioxide diffuses readily into the RBC and forms carbonic acid. The carbonic acid dissociates into hydrogen and bicarbonate ions, the latter of which diffuse into the plasma in exchange for chloride. The hydrogen ions attach to hemoglobin, whereas the carbon dioxide is carried to the lungs, where the reaction is reversed.

Regulatory Mechanisms. When the ability of buffer systems is exceeded, acid–base homeostasis is regulated by the lungs and the kidneys. The lungs adapt rapidly to an acid–base imbalance. Ordinarily, increased levels of hydrogen ions and carbon dioxide provide the stimulus for respiration. When the concentration of hydrogen ions is altered, the lungs react to correct the imbalance by altering the rate and depth of respiration. For example, when metabolic acidosis is present, respirations are increased, resulting in a greater amount of carbon dioxide being exhaled, which results in a decrease in the acidic level; when metabolic alkalosis is present, the lungs retain

carbon dioxide by decreasing the respirations, thereby increasing the acidic level (Martini & Nath, 2009).

The kidneys take from a few hours to several days to regulate acid–base imbalance. They regenerate or reabsorb bicarbonate in cases of acid excess and excrete it in cases of acid deficit. In addition, the kidneys use a phosphate ion to excrete hydrogen ions by forming phosphoric acid (H_3PO_4). Finally, the kidneys use the ammonia mechanism to regulate acid–base balance. In this mechanism, certain amino acids are chemically changed within the renal tubules into ammonia, which, in the presence of hydrogen ions, forms ammonium, which is excreted in the urine, thereby releasing hydrogen ions from the body (McCance & Huether, 2010).

Disturbances in Electrolyte, Fluid, and Acid-Base Balances

Disturbances in electrolyte, fluid, or acid–base balance seldom occur alone and can disrupt normal body processes. For example, when body fluids are lost because of burns, illness, or trauma, the patient is also at risk for electrolyte imbalances. In addition, some untreated electrolyte imbalances (e.g., potassium loss) contribute to acid–base disturbances.

Electrolyte Imbalances. Table 39-3 provides a list of the causes, signs, and symptoms of electrolyte imbalances.

Sodium Imbalances. **Hyponatremia** is a lower-than-normal concentration of sodium in the blood (serum), which can occur with a net sodium loss or net water excess (see Table 39-3). It occurs frequently in seriously ill patients and is the most common electrolyte disturbance among older adults (Soiza et al., 2008). Clinical indicators and treatment depend on the cause of hyponatremia and whether it is associated with a normal, decreased, or increased ECF volume. The usual situation is a loss of sodium without a loss of fluid, which results in a decrease in the osmolality of ECF. Sodium and chloride are not stored in the body; therefore, they must be consumed daily or provided through IV solutions in the ill.

Hypernatremia is a greater-than-normal concentration of sodium in ECF that can be caused by excess water loss or overall sodium excess (see Table 39-3). When hypernatremia occurs, the body attempts to conserve as much water as possible through renal reabsorption.

Potassium Imbalances. **Hypokalemia** is one of the most common electrolyte imbalances (see Table 39-3). Hypokalemia, with potassium levels less than 3.5 mmol/L, results in cardiac arrhythmias, fatigue, and altered muscle activity throughout the body (Day et al., 2010). Because the normal amount of serum potassium is so small, little tolerance for fluctuations exists. The most common cause of hypokalemia is the use of potassium-wasting diuretics such as thiazide and loop diuretics.

Hyperkalemia is a greater-than-normal amount of potassium in the blood. Lethal cardiac arrhythmias result from potassium levels over 5.0 mmol/L, as well as skeletal muscle weakness and paralysis (see Table 39-3). The primary cause of hyperkalemia is renal failure because any decrease in renal function diminishes the amount of potassium the kidney can excrete.

Calcium Imbalances. **Hypocalcemia** represents a drop in serum or ionized calcium. It can result from several illnesses, some of which directly affect the thyroid and parathyroid glands (see Table 39-3). Other causes include prolonged bed rest and renal insufficiency (in which the kidneys' inability to excrete phosphorus causes the phosphorus level to rise and the

calcium level to decline). Signs and symptoms can be related to diminished functioning of the neuromuscular, cardiac, and renal systems.

Hypercalcemia is an increase in the total serum concentration of calcium or ionized calcium. Hypercalcemia is frequently a symptom of an underlying disease, such as malignancy or hyperparathyroidism, resulting in excess bone reabsorption with release of calcium (McCance & Huether, 2010).

Magnesium Imbalances. Disturbances in magnesium levels are summarized in Table 39-3. Symptoms are the result of changes in neuromuscular excitability. **Hypomagnesemia**, a drop in serum magnesium below 0.65 mmol/L, occurs with malnutrition, malabsorption disorders, diarrhea, and alcohol withdrawal. This may cause neuromuscular symptoms, seizures, or cardiac arrhythmias. **Hypermagnesemia**, an increase in serum magnesium levels more than 1.05 mmol/L, depresses skeletal muscles and nerve function. Magnesium may inhibit acetylcholine, thereby causing a sedative effect.

Chloride Imbalances. **Hypochloremia** occurs when the serum chloride level falls below normal. Vomiting or prolonged and excessive nasogastric or fistula drainage can result in hypochloremia because of the loss of hydrochloric acid. The use of loop and thiazide diuretics also results in increased chloride loss as sodium is excreted. When serum chloride levels fall, metabolic alkalosis results as the body adapts by increasing reabsorption of the bicarbonate ion to maintain electrical neutrality.

Hyperchloremia occurs when the serum chloride level rises above normal, which usually occurs when the serum bicarbonate value falls or the sodium level rises. Hypochloremia and hyperchloremia rarely occur as single disease processes but are commonly associated with acid–base imbalance. No single set of symptoms is associated with these two alterations.

Fluid Disturbances. The basic types of fluid imbalances are isotonic and osmolar. Isotonic deficit and excess exist when water and electrolytes are gained or lost in equal proportion. In contrast, osmolar imbalances are losses or excesses of only water, so the concentration (osmolality) of the serum is affected. It is important to recognize that maintaining fluid homeostasis is primarily related to circulatory volume. Hemodynamics respond quickly to changes in the intravascular compartment, followed more slowly by sodium and water balance mechanisms (McCance & Huether, 2010). Table 39-4 lists the causes and signs and symptoms of common fluid disturbances.

Acid-Base Balance. **Arterial blood gas (ABG)** analysis is the best way to evaluate acid–base balance and is based on the carbonic acid–bicarbonate buffer system. Measurement of ABGs involves analysis of six components: pH, PaCO_2 , PaO_2 , oxygen saturation, base excess, and bicarbonate. Deviation from a normal value will indicate that the patient is experiencing an acid–base imbalance.

Measurements of Acidity or Alkalinity of Fluids. The pH reflects hydrogen ion concentration in the body fluids. Even a slight change can be potentially life-threatening. An increase in concentration of hydrogen ion makes a solution more acidic; a decrease makes the solution more alkaline. Normal pH value is 7.35 to 7.45; therefore, a pH value below 7.35 is acidic, and above 7.45 is alkalotic.

PaCO_2 . PaCO_2 is the partial pressure of carbon dioxide in arterial blood and is a reflection of the depth of pulmonary ventilation. The normal range is 35 to 45 mm Hg. A PaCO_2 less than 35 mm Hg is an indication that hyperventilation has occurred. As the rate and depth of respiration increase, more

► TABLE 39-3 Electrolyte Imbalances

Imbalance and Related Causes**Hyponatremia**

GI losses: vomiting, diarrhea, nasogastric suction
 Renal loss: kidney disease resulting in salt wasting; diuretics; adrenal insufficiency
 Skin loss: excessive perspiration; burns
 Psychogenic polydipsia
 Syndrome of inappropriate antidiuretic hormone (SIADH)

Signs and Symptoms

Physical examination: apprehension, personality change, postural hypotension, postural dizziness, abdominal cramping, nausea and vomiting, diarrhea, tachycardia, dry mucous membranes, convulsions, and coma
Laboratory findings: serum sodium level <135 mmol/L, serum osmolality <285 mmol/kg, and urine specific gravity <1.010 (if not caused by SIADH)

Hypernatremia

Excess salt intake: ingestion of large amounts of concentrated salt solutions; iatrogenic administration of hypertonic saline solution parenterally
 Excess aldosterone secretion
 Diabetes insipidus
 Increased sensible and insensible water losses
 Water deprivation

Physical examination: extreme thirst, dry and flushed skin, dry and sticky tongue and mucous membranes, postural hypotension, fever, agitation, convulsions, restlessness, and irritability
Laboratory findings: serum sodium levels >145 mmol/L, serum osmolality >300 mmol/kg, and urine specific gravity >1.030 (if not caused by diabetes insipidus)

Hypokalemia

Use of potassium-wasting diuretics
 Diarrhea, vomiting, or other GI losses
 Alkalosis
 Excess aldosterone secretion
 Polyuria
 Extreme sweating
 Excessive use of potassium-free intravenous solutions
 Treatment of diabetic ketoacidosis with insulin

Physical examination: weakness and fatigue, muscle weakness, nausea and vomiting, intestinal distension, decreased bowel sounds, decreased deep tendon reflexes, ventricular dysrhythmias, paraesthesias, and weak, irregular pulse
Laboratory findings: serum potassium level <3.5 mmol/L; ECG abnormalities (flattened T wave, ST segment depression, U wave); potentiated digoxin effects (e.g., ventricular dysrhythmias)*

Hyperkalemia

Renal failure
 Fluid volume deficit
 Massive cellular damage such as from burns and trauma
 Iatrogenic administration of large amounts of potassium intravenously
 Adrenal insufficiency
 Acidosis, especially diabetic ketoacidosis
 Rapid infusion of stored blood
 Use of potassium-sparing diuretics
 Ingestion of K⁺ salt substitutes

Physical examination: anxiety, dysrhythmias, paraesthesia, weakness, abdominal cramps, and diarrhea
Laboratory findings: serum potassium level >5.0 mmol/L; ECG abnormalities (peaked T wave and widened QRS complex [bradycardia, heart block, dysrhythmias]; eventually, QRS pattern widens and cardiac arrest occurs*)

Hypocalcemia

Rapid administration of blood transfusions containing citrate
 Hypoalbuminemia
 Hypoparathyroidism
 Vitamin D deficiency
 Pancreatitis
 Alkalosis
 Chronic renal failure
 Chronic alcoholism

Physical examination: numbness and tingling of fingers and circumoral (around mouth) region, hyperactive reflexes, positive Trousseau's sign (carpopedal spasm with hypoxia), positive Chvostek's sign (contraction of facial muscles when facial nerve is tapped), tetany, muscle cramps, and pathological fractures (chronic hypocalcemia)
Laboratory findings: serum ionized calcium level <1.05 mmol/L or total serum calcium level <2.25 mmol/L; ECG abnormalities (ventricular tachycardia)

Hypercalcemia

Hyperparathyroidism
 Osteometastasis
 Paget's disease
 Osteoporosis
 Prolonged immobilization
 Acidosis
 Thiazide diuretics

Physical examination: anorexia, nausea and vomiting, weakness, hypoactive reflexes, lethargy, flank pain (from kidney stones), decreased level of consciousness, personality changes, and cardiac arrest
Laboratory findings: serum ionized calcium level >1.30 mmol/L or total serum calcium level >2.75 mmol/L; abnormalities visible on X-ray examination (generalized osteoporosis, widespread bone cavitation, radiopaque urinary stones); elevated blood urea nitrogen level >7.1 mmol/L and elevated creatinine level >106 mmol/L, caused by fluid volume deficit or renal damage caused by urolithiasis; ECG abnormalities (heart block)

Continued

► **TABLE 39-3** Electrolyte Imbalances—cont'd**Imbalance and Related Causes****Hypomagnesemia**

Inadequate intake: malnutrition and alcoholism
 Inadequate absorption or loss: diarrhea, vomiting, nasogastric drainage, fistulas, diseases of small intestine
 Excessive loss resulting from thiazide diuretics
 Aldosterone excess
 Polyuria

Signs and Symptoms

Physical examination: muscular tremors, hyperactive deep tendon reflexes, confusion and disorientation, tachycardia, hypertension, dysrhythmias, and positive Chvostek's and Trousseau's signs
Laboratory findings: serum magnesium level <0.65 mmol/L

Hypermagnesemia

Renal failure
 Excess oral or parenteral intake of magnesium

Physical examination: acute elevations in magnesium levels: hypoactive deep tendon reflexes, decreased depth and rate of respirations, hypotension, and flushing
Laboratory findings: serum magnesium level >1.05 mmol/L; ECG abnormalities (prolonged QT interval, atrioventricular block)

ECG, Electrocardiogram; GI, gastrointestinal.

*Data from Heitz, U. E., & Horne, M. M. (2005). *Mosby's pocket guide series: Fluid, electrolyte, and acid-base balance* (5th ed.). St Louis, MO: Mosby.

► **TABLE 39-4** Fluid Disturbances**Imbalance and Related Causes****Isotonic Imbalances****Fluid Volume Deficit: Water and Electrolytes Lost in Equal or Isotonic Proportions**

GI losses such as diarrhea, vomiting, or drainage from fistulas or tubes
 Loss of plasma or whole blood, such as burns or hemorrhage
 Excessive perspiration
 Fever
 Decreased oral intake of fluids
 Confusion or depression
 Use of diuretics

Signs and Symptoms

Physical examination: postural hypotension, tachycardia, dry mucous membranes, poor skin turgor, thirst, confusion, rapid weight loss, slow vein filling, flat neck veins, lethargy, oliguria (<30 mL/hr), weak pulse
Laboratory findings: urine specific gravity >1.030, increased hematocrit level >50%, and increased BUN level >7.1 mmol/L (see Appendix B) (hemoconcentration)

Fluid Volume Excess: Water and Sodium Retained in Isotonic Proportions

Heart failure
 Renal failure
 Cirrhosis of the liver
 Increased serum aldosterone and steroid levels
 Excessive sodium intake or administration

Physical examination: rapid weight gain, edema (especially in dependent areas), hypertension, polyuria (if renal mechanisms are normal), neck vein distension, increased blood venous pressure, crackles in lungs, confusion
Laboratory findings: decreased hematocrit level <30% and decreased BUN level <3.6 mmol/L (hemodilution)

Osmolar Imbalances**Hyperosmolar Imbalance: Dehydration**

Diabetes insipidus
 Interruption of neurologically driven thirst drive
 Diabetic ketoacidosis
 Osmotic diuresis
 Administration of hypertonic parenteral fluids or tube-feeding formulas

Physical examination: dry and sticky mucous membranes, flushed and dry skin, thirst, elevated body temperature, irritability, convulsions, coma

Laboratory findings: increased serum sodium level >145 mmol/L and increased serum osmolality >300 mmol/kg

Hypo-osmolar Imbalance: Water Excess

Syndrome of inappropriate antidiuretic hormone (SIADH)
 Excess water intake

Physical examination: decreased level of consciousness, convulsions, coma

Laboratory findings: decreased serum sodium level <136 mmol/L and decreased serum osmolality <275 mmol/kg

BUN, Blood urea nitrogen; GI, gastrointestinal.

carbon dioxide is exhaled, and the carbon dioxide concentration decreases. When the PaCO_2 is more than 45 mm Hg, hypoventilation has occurred. As the rate and the depth of respiration decrease, less carbon dioxide is exhaled and more is retained, increasing the concentration of carbon dioxide.

PaO_2 . PaO_2 is the partial pressure of oxygen in arterial blood. It has no primary role in acid-base regulation if it is

within normal limits. A PaO_2 less than 60 mm Hg can lead to anaerobic metabolism, resulting in lactic acid production and metabolic acidosis. A reduction in vital capacity (Martini & Nath, 2009) may contribute to a reduction in PaO_2 in older adults. The normal range is 80 to 100 mm Hg.

Oxygen Saturation. Oxygen saturation is the point at which hemoglobin is saturated by oxygen. Decreasing PaO_2

causes an increase in oxygen dissociation from hemoglobin. Oxygen saturation can be affected by changes in temperature, pH, and PaCO_2 . The normal range is 95% to 99%.

Base Excess. Base excess refers to the buffering systems discussed previously, with a normal range of +2 to -2. Base excess reflects deviations from a serum pH of 7.4 (neutral). Higher values of **base excess** indicate alkalosis. Negative values of base excess indicate acidosis, usually the result of the elimination of too many bicarbonate ions.

Bicarbonate. Serum bicarbonate is excreted or retained by the kidneys to maintain a normal acid-base environment. It is also the principal buffer of the ECFs of the body. A normal pH is maintained with a bicarbonate ratio 20 times that of the fluid concentration of carbonic acid (McCance & Huether, 2010). The normal range is 22 to 26 mmol/L. Less than 22 mmol/L of bicarbonate usually indicates metabolic acidosis, whereas more than 26 mmol/L indicates metabolic alkalosis.

Types of Acid-Base Imbalances

The four primary types of acid-base imbalance are respiratory acidosis, respiratory alkalosis, metabolic acidosis, and metabolic alkalosis (Table 39-5).

Respiratory Acidosis. Respiratory acidosis is marked by an increased PaCO_2 , excess carbonic acid, and an increased hydrogen ion concentration (decreased pH). This occurs when respirations are not effective in excreting carbon dioxide, resulting in an increase in hydrogen concentration. With respiratory acidosis, carbon dioxide crosses the blood-brain barrier, causing neurological changes, such as headaches, irritability, and, ultimately, impaired consciousness. Hypoxemia occurs simultaneously because of respiratory depression, resulting in further neurological impairment. Electrolyte changes such as hyperkalemia and hypercalcemia may accompany the acidosis. The renal system compensates by increasing bicarbonate and eliminating hydrogen ion.

Example: Mr. Butler comes to the emergency department short of breath. The first set of ABGs shows the following: pH = 7.26, PaCO_2 = 55 mm Hg, and bicarbonate = 23 mmol/L. His body has not yet compensated for his respiratory insufficiency. A person with chronic lung disease may present with greater compensation and a pH that is closer to normal.

Respiratory Alkalosis. Respiratory alkalosis is marked by decreased PaCO_2 and increased pH. Respiratory alkalosis can begin outside the respiratory system (e.g., anxiety with hyperventilation) or within the respiratory system (e.g., the initial phase of an asthma attack). Usually, the respiratory system corrects imbalances before compensatory changes are required.

Example: Janet is hyperventilating when she comes into the emergency department. Her ABGs are as follows: pH = 7.52, PaCO_2 = 30 mm Hg, bicarbonate = 24 mmol/L, and base excess = 2.5 mmol/L. Her kidneys have not had time to compensate and lower the bicarbonate level.

Metabolic Acidosis. Metabolic acidosis results from a decrease in serum bicarbonate or the production of organic or fixed acids. An analysis of serum electrolytes to detect an anion gap may be helpful in attempting to identify the cause of the metabolic acidosis. An **anion gap** reflects unmeasurable anions present in plasma and is calculated by subtracting the sum of chloride and bicarbonate from the amount of plasma sodium concentration. Compensation for metabolic acidosis initially involves an increase in respiratory rate and depth to eliminate

carbon dioxide. If not quickly resolved, renal mechanisms are stimulated to increase hydrogen ion excretion, and to generate and release bicarbonate into the ECF.

Example: Ms. Jane Smith is admitted to hospital after having run her first marathon. Her electrolytes are as follows: sodium = 131 mmol/L, bicarbonate = 9 mmol/L, and chloride = 86 mmol/L. You would calculate the anion gap as follows: $\text{Na} - (\text{HCO}_3^- + \text{Cl}^-) = 131 - (9 + 86) = 36$ mmol/L. The normal anion gap is less than 16 mmol/L (so her anion gap is high). Ms. Smith receives a diagnosis of lactic acidosis related to tissue hypoxia.

Diabetic ketoacidosis (DKA) is characterized by hyperglycemia, high ketones, and metabolic acidosis. This diabetic emergency is caused by a total lack of insulin, in type 1 diabetes, causing severely elevated glucose levels. The body responds to the glucose deficit inside the cells by mobilizing fats, a process that results in increased ketone bodies. Together, these metabolic processes cause osmotic diuresis, acidosis, and hyperkalemia. Patients with type 2 diabetes are also at risk of developing metabolic acidosis from severe hyperglycemia, although the acidosis develops more slowly and is not associated with ketosis. You respond to these hyperglycemic emergencies by administering insulin and intravenous fluids beginning with 0.9% saline (Kisiel & Marsons, 2009, p. 1097). Frequent monitoring of electrolytes, fluid balance, glucose, and ABGs is important in the treatment of DKA.

Metabolic Alkalosis. Metabolic alkalosis is marked by the heavy loss of acid from the body or by increased levels of bicarbonate. The most common causes are vomiting and gastric suction, as well as potassium deficiency, hyperaldosteronism, and diuretic therapy (McCance & Huether, 2010). The body attempts to compensate by increasing the excretion of bicarbonate and decreasing the rate and the depth of respirations. Symptoms associated with metabolic alkalosis are depressed respirations and tingling of the fingers and dizziness related to secondary low calcium (Day et al., 2010). In serious metabolic alkalosis, cardiac arrhythmias can occur.

Example: Mr. Jones comes into the clinic with persistent vomiting. His ABGs are as follows: pH = 7.63, bicarbonate = 45 mmol/L, PaCO_2 = 48 mm Hg, and base excess = 16 mmol/L. He is in metabolic alkalosis.

Knowledge Base of Nursing Practice

The essential functions of fluid, electrolyte, and acid-base balances are important aspects of the scientific knowledge base of nursing practice. In all areas of nursing practice, nurses attend to the relationship between healthy water and human health (Davidhizar et al., 2004). Regardless of the area of practice, all nurses will be involved in assessment, planning, and interventions in relation to water, electrolytes, and factors that influence acid-base balance. Certain patients are particularly vulnerable to imbalances, including infants, older adults, and the severely ill. Patients who are disoriented or immobile are also vulnerable to imbalances because they cannot respond independently to early symptoms. If untreated, over time, the body can no longer maintain fluid and electrolyte or acid-base balances adequately, and the patient's health becomes compromised. Prolonged or severe compromises may lead to irreversible chronic health problems (Box 39-2). Good nursing care involves informed assessment in relation to fluid, electrolyte, and acid-base balances.

► TABLE 39-5 Acid-Base Imbalances

Imbalance and Related Causes**Respiratory Acidosis****Hypoventilation Resulting From Primary Respiratory Problems**

Atelectasis pneumonia
Cystic fibrosis
Respiratory failure
Airway obstruction
Chest wall injury

Hypoventilation Resulting From Factors Outside the Respiratory System

Drug overdose with a respiratory depressant
Paralysis of respiratory muscles caused by various neurological alterations
Head injury
Obesity

Signs and Symptoms

Physical examination: confusion, dizziness, lethargy, headache, ventricular dysrhythmias, warm and flushed skin, muscular twitching, convulsions, and coma

Laboratory findings: arterial blood gas alterations: pH <7.35, PaCO₂ >45 mm Hg, PaO₂ <80 mm Hg, and bicarbonate level normal (if uncompensated) or >26 mmol/L (if compensated)

Physical examination: confusion, dizziness, lethargy, headache, ventricular dysrhythmias, warm and flushed skin, muscular twitching, convulsions, and coma

Laboratory findings: arterial blood gas alterations: pH <7.35, PaCO₂ >45 mm Hg, PaO₂ <80 mm Hg, and bicarbonate level normal (if uncompensated) or >26 mmol/L (if compensated)

Respiratory Alkalosis**Hyperventilation Resulting From Primary Respiratory Problems**

Asthma
Pneumonia
Inappropriate mechanical ventilator settings

Physical examination: dizziness, confusion, dysrhythmias, tachypnea, numbness and tingling of extremities, convulsions, and coma

Laboratory findings: arterial blood gas alterations: pH >7.45, PaCO₂ <35 mm Hg, PaO₂ normal, and bicarbonate level normal (if short-lived or uncompensated) or <22 mmol/L (if compensated)

Hyperventilation Resulting From Factors Outside the Respiratory System

Anxiety
Hypermetabolic states (fever, exercise)
Disorders of the central nervous system (head injuries, infections)
Salicylate overdose

Physical examination: dizziness, confusion, dysrhythmias, tachypnea, numbness and tingling of extremities

Laboratory findings: arterial blood gas alterations: pH >7.45, PaCO₂ <35 mm Hg, PaO₂ normal, and bicarbonate level normal (if short-lived or uncompensated)

Metabolic Acidosis**High Anion Gap**

Starvation
Diabetic ketoacidosis
Renal failure
Lactic acidosis from heavy exercise
Use of drugs (e.g., methanol, ethanol, formic acid, paraldehyde, aspirin)

Physical examination: headache, lethargy, confusion, dysrhythmias, tachypnea with deep respirations, abdominal cramps, and flushed skin

Laboratory findings: arterial blood gas alterations: pH <7.35, PaCO₂ normal (if uncompensated) or <35 mm Hg (if compensated), PaO₂ normal or increased with rapid, deep respirations, bicarbonate level <22 mmol/L, and oxygen saturation normal

Normal Anion Gap

Renal tubular acidosis
Diarrhea

Physical examination: headache, lethargy, confusion, dysrhythmias, tachypnea with deep respirations, abdominal cramps, and flushed skin

Laboratory findings: arterial blood gas alterations: pH <7.35, PaCO₂ normal (if uncompensated) or <35 mm Hg (if compensated), PaO₂ normal or increased with rapid, deep respirations, anion gap (difference between positive ions and negative ions) of greater than 12 mmol/L

Metabolic Alkalosis

Excessive vomiting
Prolonged gastric suctioning
Hypokalemia or hypercalcemia
Excess aldosterone
Use of drugs (steroids, sodium bicarbonate, diuretics)

Physical examination: dizziness; dysrhythmias; numbness and tingling of fingers, toes, and circumoral region; muscle cramps; tetany

Laboratory findings: arterial blood gas alterations: pH >7.45, PaCO₂ normal (if uncompensated) or >45 mm Hg (if compensated), PaO₂ normal, and bicarbonate level >26 mmol/L

PaCO₂, Partial pressure of carbon dioxide in arterial blood; PaO₂, partial pressure of oxygen in arterial blood; pH, measurement of the acidity or alkalinity of a fluid.

► BOX 39-2

Risk Factors for Fluid, Electrolytes, and Acid-Base Imbalances**Age**

Very young
Very old

Gender

Women

Environment

Diet
Exercise
Hot weather and sweating

Chronic Diseases

Cancer
Cardiovascular disease, such as heart failure
Endocrine disease such as Cushing's disease and diabetes mellitus
Malnutrition
Chronic obstructive pulmonary disease
Renal disease

Trauma

Crush injuries
Head injuries
Burns

Therapies

Diuretics
Steroids
Intravenous therapy
Total parenteral nutrition (TPN)

Gastrointestinal Losses

Gastroenteritis
Nasogastric suctioning
Fistulas

Knowledge

- Physiology of fluid, electrolyte, and acid-base balances
- Disease and other alterations of fluid, electrolyte, and acid-base balances
- Role of developmental stage in fluid, electrolyte, and acid-base balances
- Role of medications in fluid balance
- Influence common risk factors have on fluid and electrolyte balances

Experience

- Caring for patients with impaired fluid balance
- Personal experience with dehydration secondary to high environmental temperature, prolonged physical activity, mild gastrointestinal upset

Assessment

- Identify recurring and present symptoms associated with the patient's fluid alteration
- Determine how the patient's underlying disease affects daily function
- Determine the patient's medication use
- Assess the patient's physical examination findings
- Assess the patient's laboratory results

Standards

- Apply intellectual standards of accuracy, relevancy, and significance to obtaining a health history of the patient with fluid alterations
- Apply Infusion Nurses Society (INS) standards for assessing fluid balance (INS, 2006)
- Consider laboratory standards for normal electrolyte values

Qualities

- Use discipline to obtain complete and correct assessment data regarding patient's fluid status
- Be responsible for collecting appropriate specimens for diagnostic and laboratory tests related to the patient's fluid balance

Critical Thinking

Successful critical thinking requires a synthesis of knowledge, experience, information gathered from patients, critical thinking qualities, and intellectual and professional standards. You must use clinical judgments to anticipate the information necessary, analyze the data, and make decisions regarding patient care. During assessment (Figure 39-7), you must consider all elements that contribute to making appropriate nursing diagnoses.

To understand how fluid, electrolyte, and acid-base imbalances affect the patient, you must integrate knowledge of physiology, pathophysiology, and pharmacology with previous experiences and information gathered from the patient. Professional standards provide valuable guidelines for comprehensive assessment and intelligent planning and intervention.

Nursing Process

◆ Assessment

Patient care begins with informed assessment, including the status of the patient's fluid, electrolyte, and acid-base balances. Assessment is informed by knowledge of risk factors, physiology, and developmental considerations. By gathering

data through a health history and physical examination, you will identify patients at risk and then identify all appropriate nursing diagnoses.

Health History

The nursing assessment begins with a nursing health history, which is designed to reveal any risk factors or preexisting conditions that may cause or contribute to a disturbance of fluid, electrolyte, and acid-base balances (Box 39-3).

Age. First, consider the patient's age. An infant's proportion of total body water, approximately 75%, is greater than that of children or adults. Infants are at a greater risk for **fluid volume deficit (FVD)** and hyperosmolar imbalance because body water loss is proportionately greater per kilogram of weight, and therefore, they have smaller reserves.

Children ages 2 through 12 years have less stable regulatory responses to imbalance and in childhood illnesses tend to have less tolerance for large changes. Children frequently respond to illnesses with fevers of higher temperatures and longer duration than those of adults, increasing their insensible water loss. Adolescents have increased metabolic processes and water production because of the major rapid changes that occur during puberty. Adolescent girls experience changes in

Figure 39-7 Critical thinking model for assessment of fluid, electrolyte, and acid-base balances.

► BOX 39-3 Nursing Assessment Questions

Nature of the Problem

- Are you currently under the care of a health care provider for management of any ongoing health problems, such as kidney or heart disease, diabetes, or blood pressure problems?
- Describe any new problems, such as vomiting, diarrhea, or a surgical procedure.
- Do you regularly take any medications, such as antacids, diuretics, or other blood pressure medication? Do you use salt substitutes or calcium or potassium supplements?

Signs and Symptoms

- In the past several weeks, have you lost or gained any weight?
- Do you feel thirsty, have a dry mouth or skin, or notice a lack of tears?
- Have you noticed a change in your urine output: decreased volume, dark colour, or concentrated appearance?
- Have you had any recent problems with vomiting or diarrhea? If so, for how long?
- Are you experiencing any problems with swelling of your hands, feet, ankles, or lower legs?
- Do you have problems breathing when you lie down at night?
- Have you noticed any dizziness, weakness, cramps, or unusual sensations, such as tingling?

Severity

- How many times a day do you urinate?
- Do you continue to feel thirsty no matter how much fluid you drink?
- Are you experiencing these symptoms more at night than in the morning?
- Are you having difficulty concentrating or do you feel confused?
- How does this compare with what is normal or usual for you?

Predisposing Factors

- How much do you usually drink every day? What type of fluids do you drink?
- Describe your normal diet. Do you frequently eat processed, canned, or frozen foods? Are you following a weight loss program?
- Have you had any recent changes in your appetite? Have you noticed any changes in the taste of your food?

Effect on the Patient

- How have these symptoms affected you?
- Are you losing sleep, feeling irritable, or having difficulty performing your usual daily tasks?

fluid balance with the hormonal changes associated with the menstrual cycle.

Because of the growing aging population, nurses need to be able to identify the risk factors for fluid and electrolyte imbalances and work to prevent them (Box 39-4). Aging has a significant impact on fluid, electrolyte, and acid-base balances and on compensatory mechanisms. Total body water proportion gradually declines with age; however, this varies significantly with gender, height, and weight (Wotton et al., 2008). With normal aging, the glomerular filtration rate is reduced, along with the number and functional capacity of nephrons. Changes in the skin and skeletal and muscle mass result in the need for a higher water intake, although older adults have a decreased thirst sensation. The reduction in taste may limit the

* BOX 39-4

EVIDENCE-INFORMED PRACTICE GUIDELINE

Preventing Dehydration in Older Adults



- Calculating fluid requirements should take into consideration individual characteristics including weight, gender, and co-morbidities, such as renal and cardiac disease.
- Identify risk factors for each older adult from the following: >70 years, female, high or low BMI, recent hospitalization, new admission to residential care, situations causing increased insensible loss, decreased access or ability to request fluids, and situations causing decreased intake, such as swallowing disorder, decreased sentence, in addition to many physiological factors. Previous malnutrition, dehydration, polypharmacy, and >3 medical conditions are significant risk factors.
- Maintain fluid intake with fluid monitoring by professional caregivers in residential care settings.
- Personal knowledge of older adults is key to early identification of risk factors and developing dehydration.
- Assessment of hydration status should include physiological measures (urine specific gravity, urine colour, blood pressure, pulse, and respiration), as well as observed intake patterns and treatments.
- Evaluate acute losses such as vomiting, medical issues such as diabetes or malnutrition, use of medications such as diuretics, cognitive level, and functional status.
- Acute management requires prompt response to prevent hypovolemia.
- Ongoing management consists of daily fluid goals, comparing current intake with physiological needs, and easy access to fluids. Balancing caffeinated and alcoholic beverages with other fluids is important.
- Documentation should include hydration, eating habits, weight, vital signs, and fluid preferences.

Adapted from Wotton, K., Crannitch, K., & Munt, R. (2008). Prevalence, risk factors and strategies to prevent dehydration in older adults. *Contemporary Nurse: A Journal for the Australian Nursing Profession*, 31(1), 44–56.

amount of oral fluids consumed. Older adults have a reduction in aldosterone, which increases sodium excretion and may result in hyponatremia. Because older adults are more susceptible to dehydration and have a higher rate of mortality from dehydration, early detection of infection and disorders in fluid balance is very important (Wotton et al., 2008).

Reduced respiratory lung capacity impairs the ability of older adults to compensate for acid-base imbalances and maintain oxygen requirements. With increased age, patients are at risk for disorders of other body systems, including the cardiovascular, renal, and endocrine systems. In addition, older adults have a decreased ability to excrete medications.

Environmental Factors. You should also include certain environmental factors in the health history. Patients who have participated in vigorous exercise or are exposed to temperature extremes may have clinical signs of fluid and electrolyte alterations. Exposure to environmental temperatures exceeding 28°C to 30°C results in excessive sweating with weight loss. A body weight loss over 7% decreases the ability of the cooling mechanism to conserve water. Loss of fluid from sweating varies and can reach up to 1 to 3 L/hour (McCance

& Huether, 2010). Inadequate fluid and electrolyte replacement can lead to imbalances.

Diet. A patient's current dietary history is an important component of nursing assessment. Dietary intake of fluids, salt, potassium, calcium, magnesium, carbohydrates, fats, and protein helps maintain normal fluid, electrolyte, and acid-base homeostasis. Recent changes in appetite or the ability to chew and swallow can affect nutritional status and hydration. When nutritional intake is inadequate, the body tries to preserve its protein stores by breaking down glycogen and fat stores. When excess free fatty acids are released, metabolic acidosis can occur because the liver converts free fatty acids to ketones, which are strong acids. With high-protein diets, ketosis can also occur. After fat and carbohydrate resources are depleted, the body begins to destroy protein stores. Hypoalbuminemia occurs with lack of amino acids in the diet and with liver dysfunction. In hypoalbuminemia, the serum colloid osmotic pressure is decreased, allowing fluid to shift from the circulating plasma to the interstitial fluid spaces.

Lifestyle. Lifestyle factors should also be included in the patient's health history. Preexisting medical risks, such as a history of smoking or alcohol consumption, can further impair the patient's ability to adapt to fluid, electrolyte, and acid-base alterations. For example, the excessive use of alcohol can ultimately cause respiratory depression, which can result in respiratory acidosis.

Medication. A final category to include in the nursing assessment is a history of prescription medication use (Box 39-5). If the assessment reveals a medication that is likely to cause an electrolyte or acid-base disorder, you will need to examine pertinent laboratory values closely. You will assess the patient's knowledge of side effects and adherence to medication schedules. You will also explore the use of over-the-counter medications and consider their influence on homeostasis.

Prior Medical History

Acute Illness. Recent surgery, head and chest trauma, sepsis, shock, and second- or third-degree burns are conditions

that place patients at high risk for fluid, electrolyte, and acid-base alterations. The patient continues to be at risk during the acute phase until the underlying process is resolved. For example, the stress response of surgery may cause fluid shifts postoperatively when aldosterone, glucocorticoids, and ADH are increasingly secreted, causing sodium and chloride retention, potassium excretion, and decreased urinary output.

Surgery. The more extensive the surgery and fluid loss are during the surgical procedure, the greater the body's response is to the surgical trauma. After surgery, patients can exhibit many acid-base changes. The patient who is reluctant to breathe deeply and cough may develop respiratory acidosis as a result of retained PaCO_2 . The patient with nasogastric suction may develop metabolic alkalosis as a result of the loss of gastric acid, fluids, and electrolytes.

Burns. The greater the body surface burned, the greater the fluid loss. The burned patient can lose body fluids by many routes. Plasma leaves the intravascular space and becomes trapped as edema. This is also called the plasma-to-interstitial fluid shift. It is accompanied by a loss of serum proteins. Plasma and interstitial fluids are also lost as burn exudate. Water vapour and heat are lost in proportion to the amount of skin that is burned away, increasing insensible losses. Blood leaks from damaged capillaries, adding to the loss of intravascular fluid volume. Sodium and water shift into the cells, further compromising ECF volume (Day et al., 2010).

Respiratory Disorders. Many alterations in respiratory function predispose the patient to respiratory acidosis. For example, pneumonia or sedative overdose interfere with the elimination of carbon dioxide due to hypoventilation. As the carbon dioxide continues to build up in the bloodstream, the body's compensatory mechanisms can no longer adapt, and the pH decreases. Likewise, hyperventilation that occurs with conditions such as fever or anxiety can cause respiratory alkalosis when too much carbon dioxide is expelled with the increased respiratory rate.

Gastrointestinal Disturbances. Gastroenteritis and nasogastric suctioning result in a loss of fluid, potassium, and chloride ions. Hydrogen ions are also lost, resulting in metabolic alkalosis. Timely education of infant and child caregivers is necessary to prevent dehydration when the infant or child is experiencing diarrhea. Gastrointestinal fistulas can also result in a loss of potassium, resulting in an increased risk for hypokalemia and acid-base imbalance.

Head Injury. Head injury can result in cerebral edema. Occasionally, this edema creates pressure on the pituitary gland, and, as a result, ADH secretion is changed. Diabetes insipidus occurs when too little ADH is secreted and the patient excretes large volumes of diluted urine with a low specific gravity. Syndrome of inappropriate antidiuretic hormone (SIADH) results in water intoxication characterized by fluid volume expansion and hyponatremia, as well as hypotonicity of fluids as a result of high urine osmolality and low serum osmolality (McCance & Huether, 2010).

Chronic Illness. Chronic disease (e.g., cancer, heart failure, or renal disease) can create fluid, electrolyte, and acid-base imbalances. The normal course of the patient's chronic disease is important in order to understand how fluid, electrolyte, and acid-base status may be affected.

Cancer. The types of fluid and electrolyte imbalances that are observed in a patient with cancer depend on the type and progression of the cancer. The potential electrolyte imbalances result from anatomical distortion and functional impairment

► BOX 39-5

Medications That Cause Fluid, Electrolyte, and Acid-Base Disturbances

- Diuretics: Metabolic alkalosis, hyperkalemia, and hypokalemia
- Steroids: Metabolic alkalosis
- Potassium supplements: Gastrointestinal disturbances, including intestinal and gastric ulcers and diarrhea
- Respiratory centre depressants (e.g., opioid analgesics): Decreased rate and depth of respirations, resulting in respiratory acidosis
- Antibiotics: Nephrotoxicity (e.g., vancomycin, methicillin, aminoglycosides); hyperkalemia or hyponatremia (e.g., azlocillin, carbenicillin, piperacillin, ticarcillin, ampicillin sodium-sulbactam sodium [Unasyn])
- Calcium carbonate (Tums): Mild metabolic alkalosis with nausea and vomiting
- Magnesium hydroxide (Milk of Magnesia): Hypokalemia
- Nonsteroidal anti-inflammatory drugs: Nephrotoxicity

Data from McKenry, L., Tessier, E., & Hogan, M. A. (2006). *Mosby's pharmacology in nursing* (22nd ed.). St Louis, MO: Mosby.

from tumour growth, or tumour-related metabolic and endocrine abnormalities. In addition, patients with cancer are at risk for fluid and electrolyte imbalances related to the side effects (e.g., diarrhea and anorexia; stomatitis) of their chemotherapeutic and radiological treatments.

Cardiovascular Disease. In the patient with cardiovascular disease, diminished cardiac output reduces kidney perfusion, causing the patient to experience a decrease in urinary output. The patient will retain sodium and water, resulting in circulatory overload, and is at risk of developing pulmonary edema. Fluid and electrolyte imbalances associated with heart disease can be controlled with medications and with fluid and sodium restrictions.

Renal Disorders. Kidney disease alters fluid and electrolyte balances by the abnormal retention of sodium, chloride, potassium, and water in the extracellular compartment. The plasma levels of metabolic waste products such as urea and creatinine are elevated because the kidneys are unable to filter and excrete the waste products of cellular metabolism. This elevation is toxic to cellular processes. Metabolic acidosis results when hydrogen ions are retained because of decreased renal function. Because of the renal disorder, the usual renal compensatory mechanisms, such as bicarbonate reabsorption, are not available; therefore, the body's ability to restore normal acid-base balance is limited.

The severity of fluid and electrolyte imbalance is proportional to the degree of renal failure. Acute renal failure is reversible. Although chronic kidney disease is progressive, the patient may be treated successfully with dietary control of protein and salt intake, diuretic medications, and fluid restrictions. In later stages, treatment with dialysis, transplantation, or both may be required.

Gastrointestinal Disorders. Chronic gastrointestinal (GI) disorders can have a serious impact on fluid, electrolyte, and acid-base balances. Inflammatory bowel diseases, such as ulcerative colitis, regional enteritis, and celiac disease, are relatively common (Day et al., 2010). Patients with liver failure may have a number of imbalances, including metabolic acidosis, ECF shifts in the case of ascites, and electrolyte disturbances. Key GI assessments include the length of the illness, the presence of exacerbations in the case of inflammatory bowel disease, and the type of treatment currently being administered. Determine whether the patient has a history of acute illnesses such as diarrhea or vomiting. Any condition that results in the loss of gastrointestinal fluids predisposes the patient to the development of dehydration and a variety of electrolyte disturbances.

Human Immunodeficiency Virus (HIV) and Acquired Immune Deficiency Syndrome (AIDS). The types of fluid and electrolyte imbalances that are observed in patients with HIV and AIDS depend on the stage of the disease and manifestations of the illness, complications (e.g., nephropathy, malignancy, and opportunistic infections), and the side effects of antiretroviral therapy. Electrolyte and acid-base imbalances can occur as a result of anorexia, nausea, vomiting, diarrhea, and malignancies. Treatment should focus on improving food and fluid intake, providing comfort measures, and addressing the cause of the imbalance.

Physical Assessment

A thorough physical examination (see Chapter 31) is necessary because fluid and electrolyte imbalances or acid-base disturbances can affect all body systems. When conducting a

physical examination, incorporate knowledge regarding the signs and symptoms of fluid, electrolyte, and acid-base imbalances; disease processes that may affect these balances; developmental considerations; and common risk factors. For example, an examination of the oral cavity may reveal signs of dehydration. Table 39-6 summarizes possible physical findings for patients with fluid, electrolyte, and acid-base imbalances.

Measuring Fluid Intake and Output. Assessing fluid balance involves knowledge of normal fluid requirements and accurate measurement techniques (Chapelhow & Crouch, 2007). Measuring and recording all intake and output during a 24-hour period is one key component of patient assessment. This is particularly important for patients after a procedure or if febrile, on restricted fluids, or receiving diuretic or intravenous therapy. Recognition of trends in intake and output is also important.

Daily weight is considered the most accurate means to evaluate fluid balance (Day et al., 2010). Weigh the patient at the same time each day with the same scale after the patient voids. Calibrate the scale routinely. The patient should wear the same clothes (or clothes that weigh the same); if you are using a bed scale, use the same number of sheets on the scale with each weighing.

Intake includes all liquids taken by mouth (e.g., gelatin, ice cream, soup, juice, and water) or through nasogastric or jejunostomy feeding tubes, intravenous fluids (including both continuous and intermittent intravenous fluids), and blood or its components. A patient receiving tube feedings may receive numerous liquid medications and water may be used to flush the tube. Over a 24-hour period, these liquids can amount to significant intake and should always be recorded on the intake and output record. Output includes urine, diarrhea, vomitus, gastric suction, and drainage from postsurgical wounds or other tubes (see Chapter 48). Daily intake should equal output plus 500 mL (to cover for insensible fluid losses).

To measure output, ambulatory patients are instructed to save their urine in a calibrated receptacle that attaches to the rim of the toilet bowl. When a patient has an in-dwelling Foley catheter, drainage tube, or suction, output is recorded at predetermined times depending on the patient's condition and physicians' orders. Patient and family cooperation is essential for accurate intake and output measurements. Teach the patient and the family the purpose of the measurements, including oral intake.

Recording intake and output is essential for obtaining an accurate database. This information helps maintain an ongoing evaluation of the patient's hydration status to prevent severe imbalances. In the hospital, forms for recording intake and output are attached to the bedside, chart, or room door (Figure 39-8). The 24-hour total is calculated as directed by agency policy. You may delegate intake and output recording to unregulated care providers with competent skills in measurement and calculation. Estimation is not acceptable.

Laboratory Studies. Review laboratory data, including serum and urinary electrolyte levels, hematocrit, blood creatinine level, blood urea nitrogen (BUN) levels, urine specific gravity, and ABG readings (Box 39-6). Serum electrolyte levels are measured to determine the hydration status, the electrolyte concentration of the blood plasma, and acid-base balance. The frequency with which these electrolyte levels are measured depends on the severity of the patient's illness. Serum electrolyte tests are routinely performed on any patient entering a hospital to screen for alterations and to serve as a baseline for

▶ TABLE 39-6

Physical and Behavioural Nursing Assessment for Fluid, Electrolyte, and Acid-Base Imbalances

Assessment**Weight Changes**

2%–5% loss
 5%–8% loss
 8%–15% loss
 >15% loss
 2% gain
 5%–8% gain

Imbalance

Mild FVD
 Moderate FVD
 Severe FVD
 Death
 Mild FVE
 Moderate to severe FVE

Head**History**

Headache
 Dizziness

Observation

Irritability

Lethargy

Confusion, disorientation

Eyes**History**

- Blurred vision

Inspection

- Sunken, dry conjunctivae, decreased or absent tearing
- Periorbital edema, papilledema

Throat and Mouth**Inspection**

- Sticky, dry mucosa, dry cracked lips, decreased salivation, longitudinal tongue furrows

FVD, * metabolic or respiratory acidosis, metabolic alkalosis
 FVD, respiratory acidosis or alkalosis, hyponatremia

Metabolic or respiratory alkalosis, hyperosmolar imbalance, hypernatremia, hypokalemia
 FVD, metabolic acidosis or alkalosis, respiratory acidosis, hypercalcemia
 FVD, hypomagnesemia, metabolic acidosis, hypokalemia

FVE

FVD

FVE

FVD, hypernatremia

Cardiovascular System**Inspection**

Flat neck veins

Distended neck veins

Dependent body parts: legs, sacrum back

Slow venous filling

Palpation

Edema: dependent body parts (legs, sacrum, back)

Dysrhythmias (also noted as ECG changes)

Increased pulse rate

Decreased pulse rate

Weak pulse

Decreased capillary filling

Bounding pulse

Auscultation

Blood pressure low or with orthostatic changes

Third heart sound (except in young children)

Hypertension

FVD

FVE

FVD

FVD

FVE

Metabolic acidosis, respiratory alkalosis and acidosis, potassium imbalance, hypomagnesemia

Metabolic alkalosis, respiratory acidosis, hyponatremia, FVD, FVE, hypomagnesemia

Metabolic alkalosis, hypokalemia

FVD, hypokalemia

FVD

FVE

FVD, hyponatremia, hyperkalemia, hypermagnesemia

FVE

FVE

Respiratory System**Inspection**

Increased rate

Dyspnea

FVE, respiratory alkalosis, metabolic acidosis

FVE

Continued

► TABLE 39-6

Physical and Behavioural Nursing Assessment for Fluid, Electrolyte, and Acid-Base Imbalances—cont'd

Assessment	Imbalance
Auscultation	
Crackles	FVE
Gastrointestinal System	
History	
Anorexia	Metabolic acidosis
Abdominal cramps	Metabolic acidosis
Inspection	
Sunken abdomen	FVD
Distended abdomen	Third-space syndrome
Vomiting	FVD, hypercalcemia, hyponatremia, hypochloremia, metabolic alkalosis
Diarrhea	Hyponatremia, metabolic acidosis
Auscultation	
Loud “growling” sounds from hyperperistalsis with diarrhea or no sounds from hypoperistalsis	FVD, hypokalemia
Renal System	
Inspection	
Oliguria or anuria	FVD, FVE
Diuresis (if kidneys are normal)	FVE
Increased urine specific gravity	FVD
Neuromuscular System	
Inspection	
Numbness, tingling	Metabolic alkalosis, hypocalcemia, potassium imbalance
Muscle cramps, tetany	Hypocalcemia, metabolic or respiratory alkalosis
Coma	Hyperosmolar or hypo-osmolar imbalances, hyponatremia
Tremors	Respiratory acidosis, hypomagnesemia
Palpation	
Hypotonicity	Hypokalemia, hypercalcemia
Hypertonicity	Hypocalcemia, hypomagnesemia, metabolic alkalosis
Skin	
Body Temperature	
Increased	Hypernatremia, hyperosmolar imbalance, metabolic acidosis
Decreased	FVD
Inspection	
Dry, flushed	FVD, hypernatremia, metabolic acidosis
Palpation	
Inelastic skin turgor, cold, clammy skin	FVD

ECG, Electrocardiogram; FVD, fluid volume deficit; FVE, fluid volume excess.

*Data from Heitz, U. E., & Horne, M. M. (2005). *Mosby's pocket guide series: Fluid, electrolyte, and acid-base balance* (5th ed.). St Louis, MO: Mosby.

future comparisons. Serum and urine osmolality are also used to assess fluid balance (Goertz, 2006). The normal range for serum osmolality is 285 to 295 mmol/kg. With dehydration, the serum osmolality will be higher than normal.

Arterial Blood Gases. To determine ABG levels, a sample of blood from an artery must be taken to assess the patient's acid-base status and the adequacy of ventilation and oxygenation. Arterial blood is drawn from a peripheral artery (usually the radial artery) or from an arterial line inserted by a physician. In some agencies, nurses are responsible for radial

artery punctures. You may also need to assist in the sampling process and care for the patient after the procedure. After the specimen is obtained, care is taken to prevent air from entering the syringe because this will affect the ABG analysis. The syringe should be transported to the laboratory immediately. In the event of a delay of more than 20 minutes, the syringe is submerged in crushed ice for transport to the laboratory to reduce the metabolism of cells. Apply pressure to the puncture site for at least five minutes to reduce the risk of hematoma formation. Reassess the pulse after pressure has been removed.



Fluid Balance Record

Date _____

Cumulative total on chest drainage system at 0700 _____ mL

Intake (mL)		Output (mL)						kg		Time	
Time	Intravenous	Total Hourly Cum	Fluid Balance	Total Hourly Cum	Urine	BM					
19											
cumulative											
20											
cumulative											
21											
cumulative											
22											
cumulative											
23											
cumulative											
24											
cumulative											
01											
cumulative											
02											
cumulative											
03											
cumulative											
04											
cumulative											
05											
cumulative											
06											
24h total											

Scale used _____

kg

Today's weight _____

Figure 39-8 Twenty-four-hour intake and output record. Source: Copyright © Alberta Health Services, 2007.

► BOX 39-6

Laboratory Data for Fluid, Electrolyte, and Acid-Base Imbalances**Fluid and Electrolytes**

Alterations in sodium, potassium, magnesium, calcium, phosphates, chloride, bicarbonate and venous carbon dioxide

Increase in hematocrit, BUN, sodium, and osmolality in serum (related to loss of ECF or gain of solutes)

Decrease in hematocrit, BUN, sodium, and osmolality in serum (related to gain of ECF or loss of solutes)

Concentrated urine demonstrated by urine specific gravity of 1.030

Dilute urine demonstrated by a specific gravity of 1.010

Metabolic Alkalosis

pH: 7.45

PaCO_2 : Normal or <45 mm Hg if lungs are compensating

PaO_2 : Normal

Oxygen saturation: Normal

Bicarbonate: 23–26 mmol/L

Potassium: 3.5 mmol/L

Metabolic Acidosis

pH: 7.35

PaCO_2 : Normal or <35 mm Hg if lungs are compensating

PaO_2 : Normal

Oxygen saturation: Normal

Bicarbonate: 22 mmol/L

Potassium: 5.0 mmol/L

Respiratory Alkalosis

pH: 7.45

PaCO_2 : 35 mm Hg

PaO_2 : Normal

Oxygen saturation: Normal

Bicarbonate: 22 mmol/L

Potassium: 3.5 mmol/L

Respiratory Acidosis

pH: 7.35

PaCO_2 : 45 mm Hg

PaO_2 : Normal or <80 mm Hg, depending on cause of acidosis

Oxygen saturation: Normal or 95%, depending on cause of acidosis

Bicarbonate: Normal if early respiratory acidosis or >26 mmol/L if kidneys are compensating

Potassium: 5.0 mmol/L

BUN, Blood urea nitrogen; *ECF*, extracellular fluid; PaCO_2 , partial pressure of carbon dioxide in arterial blood; PaO_2 , partial pressure of oxygen in arterial blood; *pH*, measurement of acidity or alkalinity of a fluid.

Patient Expectations

Often the patient's fluid, electrolyte, or acid-base disturbance is so serious that it prevents a review of patient expectations. However, if a patient is alert enough to discuss care, explore short-term needs (e.g., provision of comfort from nausea) and long-term needs (e.g., understanding how to prevent alterations from occurring in the future). You may also explore patient expectations with family and supportive friends. Strengthen the patient's trust through a competent response to sudden changes in condition and through communication with patients and/or family members.

► BOX 39-7

NURSING DIAGNOSTIC PROCESS**Deficient Fluid Volume****Assessment Activities**

Assess blood pressure and pulse
Obtain daily weight measurements
Observe volume of urine output and measure intake and specific gravity
Assess skin turgor
Ask if patient is thirsty or weak
Inspect mucous membranes for degree of moisture

Defining Characteristics

Patient is hypotensive, with increased heart rate
Patient experiences sudden weight loss
Decreased volume of output in comparison to intake; increased urine specific gravity is present
Inelastic skin turgor noted
Patient verbalizes thirst and weakness
Dry mucous membranes are noted

❖Nursing Diagnosis

When caring for patients with suspected fluid, electrolyte, and acid-base imbalances, it is particularly important to use critical thinking to formulate nursing diagnoses. The assessment data that establish the risk for or the actual presence of a nursing diagnosis in these areas may be subtle, and patterns and trends emerge only when you conscientiously assess for them. You must keep in mind that many body systems may be involved. Clustering of defining characteristics will lead you to select the appropriate diagnoses. For example, the nursing diagnosis *deficient fluid volume* is developed in Box 39-7.

An important part of formulating nursing diagnoses is identifying the relevant causative or related factor. The nursing interventions are chosen to treat or modify the related factor. *Deficient fluid volume related to loss of gastrointestinal fluids via vomiting* necessitates therapies different from those needed for *deficient fluid volume related to elevated body temperature*.

Possible nursing diagnoses for patients with fluid, electrolyte, and acid-base alterations are the following:

- *Actual or risk of deficient fluid volume*
- *Actual or risk of excess fluid volume*
- *Decreased cardiac output*
- *Impaired breathing pattern*
- *Impaired gas exchange*
- *Impaired tissue perfusion*
- *Acute confusion*
- *Impaired oral mucous membrane*
- *Actual or risk of impaired skin integrity*
- *Impaired mobility*
- *Ineffective therapeutic regimen management*
- *Impaired tissue integrity*
- *Deficient knowledge regarding disease management*

❖Planning

During the planning process, use critical thinking to synthesize information from multiple sources and to ensure that the patient's care plan integrates both scientific and nursing knowledge, your knowledge of the individual, and the patient's expectations (Figure 39-9).

Goals and Outcomes

Develop an individual care plan for the nursing diagnoses (see Box 39-7 and Box 39-8). Goals or expectations for care

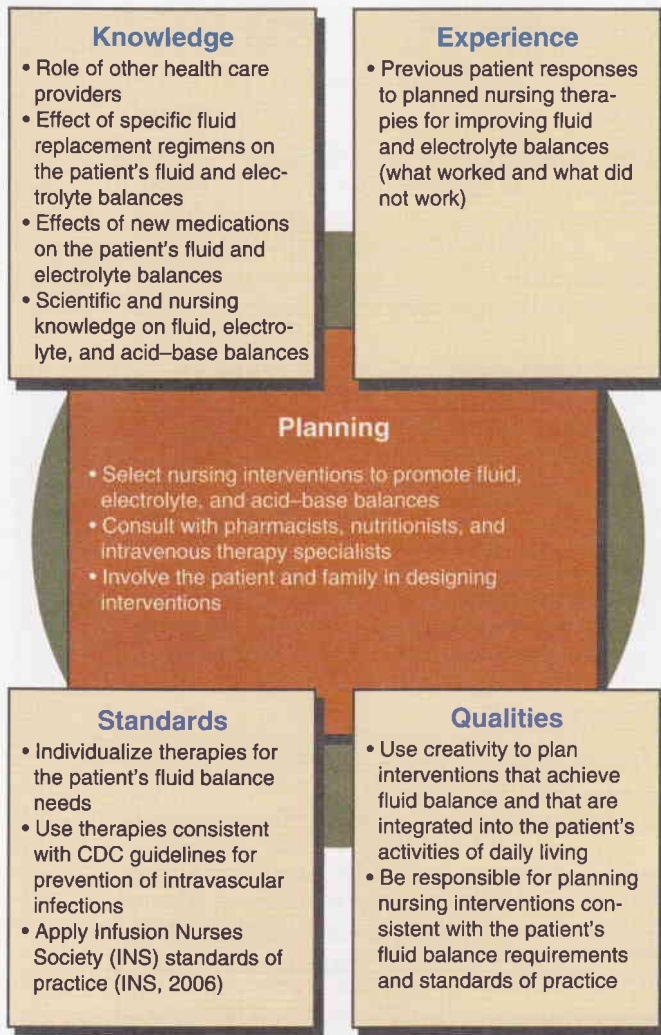


Figure 39-9 Critical thinking model for planning fluid, electrolyte, and acid-base balances.

set by you and the patient should be individualized and realistic, with measurable outcomes. For example, if the goal is to achieve and maintain homeostasis, the following related outcomes might be established: *The patient will have normal fluid and electrolyte balance at discharge:*

- The patient will be free of complications associated with the intravenous therapy.
- The patient will demonstrate fluid balance by moist, mucous membranes and good skin turgor.
- The patient will have serum electrolytes within the normal range within 48 hours.

Setting Priorities

The patient's clinical condition will determine which diagnosis takes the greatest priority. Many nursing diagnoses in the area of fluid, electrolyte, and acid-base balances are of highest priority because the consequences for the patient can be serious or even life-threatening. For example, in the concept map for the patient with gastroenteritis and dehydration (Figure 39-10), nausea and diarrhea have caused a fluid volume deficit and electrolyte imbalances. Without treating the cause, the fluid, electrolyte, and acid-base imbalances will progress.

Consultation with the patient's physician may assist in setting realistic time frames for the goals of care, particularly when the patient's physiological status is unstable. During planning, collaborate as much as possible with the patient, family, and other members of the health care team. The family can be particularly helpful in identifying subtle changes in a patient's behaviour associated with imbalances (e.g., anxiety, confusion, or irritability).

Continuity of Care

For patients with acute disturbances, discharge planning must begin early. You must ensure that care can continue in the home or long-term care setting with few disruptions. For example, when a patient is discharged on intravenous therapy, you must determine the knowledge and skills of the person who is to assume caregiving responsibilities and make a referral for home intravenous therapy as soon as possible. You must also collaborate closely with other members of the health care team, such as the dietitian, pharmacist, and physician. In consultation with a dietitian, you can recommend foods to increase intake of certain electrolytes or reduce intake as necessary (see Chapter 42). The pharmacist can help identify medications likely to cause electrolyte or acid-base disturbances and describe possible side effects of the patient's prescribed drugs. The physician directs the treatment of any fluid, electrolyte, or acid-base alteration.

Implementation

Health Promotion

Health promotion activities in the area of fluid, electrolyte, and acid-base imbalances include patient education regarding fluid and electrolyte requirements, promotion of healthy environments affecting hydration, and advocating for secure access to safe water as a universal need and human right (International Council of Nurses [ICN], 2008).

Patients and caregivers need to recognize risk factors for imbalances and implement appropriate preventive measures. For example, parents of infants need to understand that gastrointestinal losses can quickly lead to serious imbalances. When an infant is vomiting or has diarrhea, the parent must recognize the risk and promptly seek health care to restore normal balance. Even a healthy adult is at risk for developing imbalances when subjected to high temperatures. Advise patients to increase water intake, maintain adequate ventilation, and refrain from excessive activity during heat waves. Refer to Box 39-4 for guidelines for preventing dehydration in older adults.

All patients with a chronic health alteration are at risk for developing changes in their fluid, electrolyte, and acid-base balances. They need to understand their own risk factors and the measures to be taken to avoid imbalances. For example, patients with renal failure must avoid excess intake of fluid, sodium, potassium, and phosphorus. Through diet education, these patients learn the types of foods to avoid and the suitable volume of fluid they are permitted daily (Box 39-9; see Chapter 42). Patients with chronic health conditions need to be made aware of early signs and symptoms of fluid, electrolyte, and acid-base imbalances. A patient with heart disease should be instructed to obtain an accurate body weight each day at approximately the same time and to inform the health care provider of significant changes in weight from one day to another. Increase in weight, shortness of breath,

► BOX 39-8 NURSING CARE PLAN

Fluid Volume Deficit

Assessment

Mrs. Hilda Topping is a 72-year-old who presented to her health care provider this morning concerned about two days of vomiting and diarrhea. She initially thought that she had food poisoning, but the symptoms have not abated, and she now feels very weak and dizzy and has a headache. After an initial assessment, Mrs. Topping's physician admits her to a medical unit with a diagnosis of dehydration secondary to gastroenteritis. She had baseline blood work and an abdominal X-ray to rule out bowel obstruction. The significant findings are an elevated hematocrit at 56%, elevated hemoglobin (160 g/L), hypernatremia (sodium 146 mmol/L), hypokalemia (potassium 3.2 mmol/L), and elevated blood urea nitrogen (BUN) (10 mmol/L) and creatinine (90 mmol/L). Mrs. Topping's vital signs on admission were as follows: B/P 80/66, P 110, R 18/min, T 37.8, O₂ saturation 95% on room air.

Assessment Activities

Ask Mrs. Topping to describe her activities before onset of her symptoms, including any recent travel.

Findings and Defining Characteristics

Mrs. Topping states that she has been caring for her great-grandchildren for the past week during their school break. She is aware that one of the children had a "tummy upset." In addition, she reports that she had taken them to a fast-food restaurant for a treat. She has not been travelling.

Have Mrs. Topping describe her symptoms, including the frequency and quality of her bowel movements and emesis.

Mrs. Topping describes up to 10 liquid stools per day, accompanied by waves of nausea. With nausea, she often vomits bile-coloured liquid in very small amounts. She had taken a cup of tea twice over the previous day but was "unable to keep [it] down." She describes acute cramping pain.

Assess her vital signs, bowel sounds, skin turgor, and the characteristics of her urine and output every four hours.

She has increased bowel sounds throughout her abdomen. Her mucous membranes are dry, her tongue is coated, and her lips are cracked. Her urine is dark amber, and she voided only 100 mL on request for a sample.

Evaluate her ABGs.

ABG results show metabolic alkalosis. Her pH = 7.5, bicarbonate = 45 mmol/L, PaCO₂ = 48 mm Hg, and base excess = 11 mmol/L.

Nursing Diagnosis: FVD from excessive loss of fluid and electrolytes through increased gastrointestinal loss.

Planning

Goals (Nursing Outcomes Classification)*

The patient will maintain fluid balance as evidenced by balanced intake and output, maintenance of adequate hydration, and absence of manifestations of fluid volume deficit.

Expected Outcomes

Electrolyte and Acid-Base Balances

Patient's vital signs will return to normal and remain stable. No orthostatic blood pressure evident.

ABG levels will be within normal limits in 24 hours.

Electrolyte values and any other abnormal blood work values will return to normal within 24 hours.

Fluid Balance

Urinary output will increase to 1300–1500 mL over the next 23 hours.

Patient's fluid volume will return to normal and remain within normal limits throughout hospital stay.

Mucous membranes will remain moist.

The patient will not develop late signs of hypovolemia.

Renal damage will be prevented and the patient will not develop signs acute renal failure or shock (cyanosis, cold clammy skin, weak thready pulse, confusion, and oliguria).

Abdominal Pain

The patient will report relief of abdominal pain.

Patient will have a reduction in abdominal cramping within two hours.

Interventions (Nursing Interventions Classification)*

Fluid, Electrolyte, and Acid-Base Management

Initiate and administer intravenous solution per physician's order.

Rationale

Administering parenteral fluids is an effective way to restore fluid balance when oral ingestion of fluid is contraindicated.

Provide ice chips and lip cream to relieve symptoms of mouth dryness.

Oral fluids in small, frequent amounts stabilize the digestive system. Hypotonic glucose-electrolyte solutions increase the net fluid absorption (Ackley & Ladwig, 2011).

BOX 39-8 NURSING CARE PLAN—cont'd

Interventions (Nursing Interventions Classification)*

Increase fluid intake when gastrointestinal symptoms have resolved, beginning with clear fluids and advancing to full fluids and light meals.

Prepare the patient for the diagnostic tests and possible antibiotic therapy.

Pain Management

Administer antiemetics and analgesics for the first 24 hours and re-evaluate.

Place a warm blanket on the patient's abdomen.

Rationale

When symptoms have resolved, beginning with clear fluids prevents recurrence of distress and minimizes gastrointestinal pain.

Pharmacotherapy is important for treating nausea, emesis, and pain.

Other comfort measures, such as using warm blankets, are important complementary pain management strategies.

Evaluation

Nursing Actions

Monitor ABG levels, vital signs, intake and output, daily weight, and bowel sounds.

Assess mucous membranes.

Patient Response and Finding

ABG analysis: pH = 7.36, PaO₂ = 95, bicarbonate = 35, PaCO₂ = 38.

Mucous membranes are moist.

Achievement of Outcome

Mrs. Topping's acid-base balance returns to normal. Her intake and output measurements are balanced. Her daily weight remains stable.

She is able to take clear fluids, and her intravenous rate is reduced.

*Outcome classification and intervention classification labels from Ackley, B. J., & Ladwig, G. B. (2011). *Nursing diagnosis handbook: An evidence-based guide to planning* (9th ed.). St Louis, MO: Mosby Elsevier.

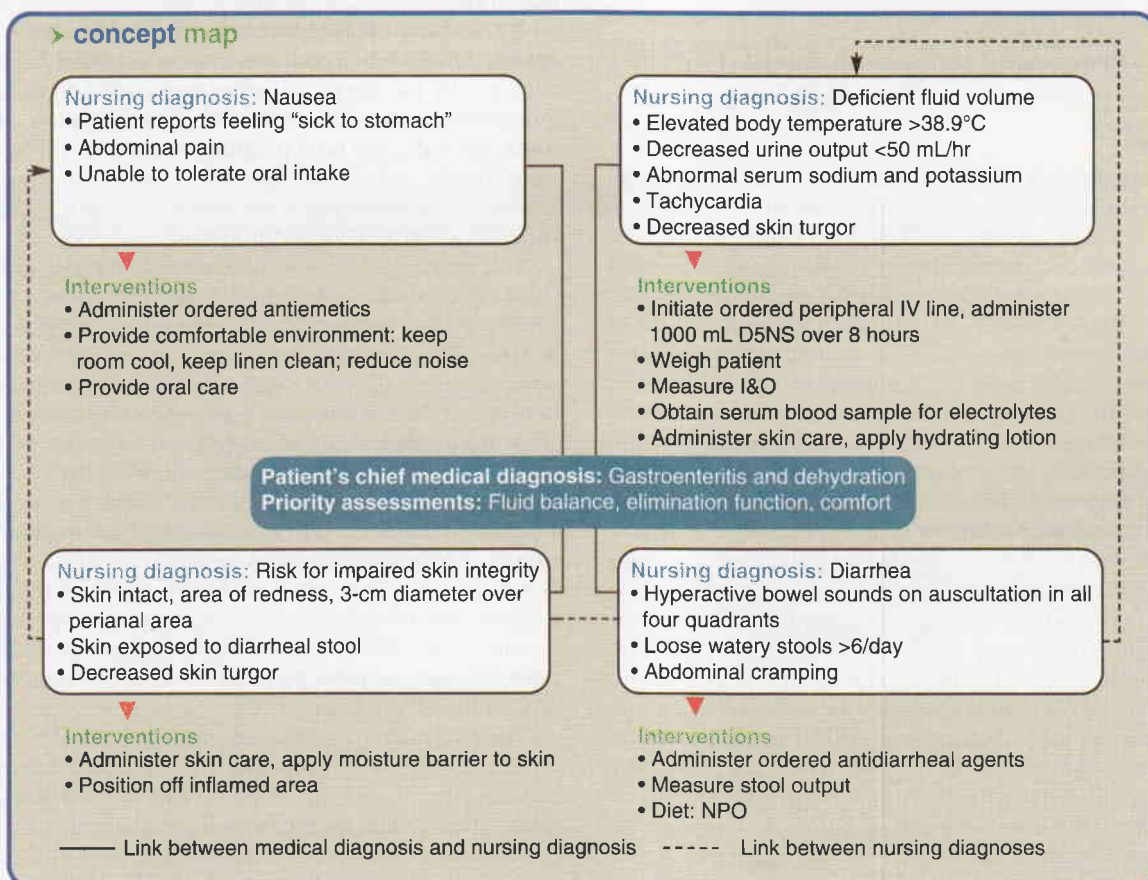


Figure 39-10 Concept map for a patient with gastroenteritis and dehydration. D5NS, Dextrose 5% in 0.9% sodium chloride; I&O, intake and output; NPO, nothing by mouth.

* BOX 39-9 PATIENT TEACHING

Primary Health Care and Patient Teaching: Preventing and Managing Chronic Kidney Disease



Chronic kidney disease is a major burden for both individuals and the health care system to carry. The accumulation of waste products and the fluid, electrolyte, and acid-base imbalances associated with this disease have many negative results. Primary health care for patients with chronic kidney disease can alleviate some of the morbidity, early mortality, and psychosocial and financial challenges for patients and their families. Cardiovascular disease is a major cause of death of people with chronic kidney disease. Patients should be taught that the progression of kidney disease can be slowed and cardiovascular risk reduced through the following measures:

- Smoking cessation
- Control of blood pressure
- Control of blood sugar for patients with diabetes
- Control of lipids, antiplatelet therapy
- Renin-angiotensin system antagonism
- Management of anemia
- Control of calcium and phosphate levels

Data from Barrett, B. J. (2003). Applying multiple interventions in chronic kidney disease. *Seminars in Dialysis*, 16, 157–164; and Curtis, B. M., Levin A., & Parfrey, P. S. (2005). Multiple risk factor intervention in chronic kidney disease: Management of cardiac disease in chronic kidney disease patients. *Medical Clinics of North America*, 89, 511–523.

orthopnea, and dependent edema are all associated with fluid retention.

Acute Care

Fluid, electrolyte, and acid-base imbalances can occur in all settings, although many patients are cared for in acute care settings. Today, management of the patient's complex medical care is completed in a shorter span of time at the same as there are expectations to perform more difficult technological skills.

Enteral Replacement of Fluids. Oral replacement of fluids and electrolytes is appropriate as long as the patient is not so physiologically compromised that oral fluids cannot be replaced rapidly. Patients unable to tolerate solid foods may still be able to ingest fluids. Oral rehydration solutions (ORS) have had a very positive impact on mortality related to diarrhea around the world. ORS are either glucose-electrolyte solutions or polymer-based solutions (e.g., made from rice, wheat, or maize). Recent evidence suggests that polymer-based solutions may be more effective in rehydration (Gregorio et al., 2009). You may also use strategies to encourage fluid intake such as frequently offering small sips of fluid, ice pops, and ice chips. Ice chips should be included in the intake and output measurements, at one-half the volume of the chips (i.e., 250 mL of ice chips = 125 mL). Hartling et al. (2006) conducted a systematic review and concluded that oral hydration is effective and safe in treating dehydration in children with gastroenteritis, particularly with low-osmolality solutions, in keeping with World Health Organization (WHO) recommendations. A key nursing role is to encourage children and their caregivers regarding oral rehydration.

Oral replacement of fluids is contraindicated if the patient has a mechanical obstruction of the gastrointestinal tract, is at

risk for aspiration, or has impaired swallowing. A feeding tube may be necessary such as when the patient's gastrointestinal tract is healthy, but the patient cannot ingest fluids (e.g., with impaired swallowing). Fluids can also be replaced through a gastrostomy or jejunostomy feeding tube or administered via a small-bore nasogastric feeding tube.

Restriction of Fluids. Patients who retain fluids and have **fluid volume excess (FVE)** require restricted fluid intake. Fluid restriction is often difficult for patients, particularly if they take medications that dry the oral mucous membranes, or if they breathe through the mouth. You should provide the rationale for fluid restrictions and the amount permitted. The patient and family need to understand that ice chips, gelatin, and ice cream are considered fluid. The patient should be involved in decisions regarding the amount of fluid and the distribution of fluids over the day. Patients on fluid restriction can swallow a number of pills with as little as 30 mL of liquid. Patients on fluid restriction require mouth care frequently to moisten mucous membranes, decrease the chance of mucosal drying and cracking, and maintain comfort.

Interventions for Acid-Base Imbalances. Nursing interventions to promote acid-base balance support prescribed medical therapies and are aimed at reversing the acid-base imbalance. Such imbalances can be life-threatening and require rapid correction. In collaboration with the physician, you must maintain a functional intravenous line and provide prescribed medications, such as insulin or sodium bicarbonate, and fluid and electrolyte replacement promptly. Patients with acid-base disturbances usually require repeated ABG analysis and close monitoring.

Parenteral Replacement of Fluids and Electrolytes. Fluid and electrolytes may be replaced through infusion directly into the blood rather than via the digestive system. Parenteral replacement includes administration of **crystalloids, colloids, and total parenteral nutrition (TPN)**. TPN is a nutritionally adequate hypertonic solution consisting of glucose, other nutrients, and electrolytes. See Chapter 42 for a full discussion of TPN and nutritional support.

The goal of intravenous fluid administration is to maintain fluid, electrolyte, and energy demands when patients are limited in their intake and to correct or prevent fluid and electrolyte disturbances from excess losses. Intravenous fluid administration allows for direct access to the vascular system, permitting the continuous infusion of fluids over a period of time. Intravenous fluid therapy must be continuously regulated to assess for changes in the patient's fluid and electrolyte balances. Knowledge of the correct ordered solution, the equipment needed, the procedures required to initiate an infusion, how to regulate the infusion rate and maintain the system, how to identify and correct problems, and how to discontinue the infusion is necessary for safe and appropriate therapy. Because of the risk of transmission of infectious diseases, standard precautions must be followed when administering parenteral fluids (see Chapter 32).

The two main categories of intravenous fluids are crystalloids and colloids. Crystalloids are used most commonly and include glucose, sodium chloride, and lactated Ringer's solutions. These solutions contain solutes that mix, dissolve, and cross semipermeable membranes. They vary in their tonicity. Colloids contain protein or starch (Phillips, 2005), which does not cross semipermeable membranes and therefore remains suspended and distributed in the extracellular space, primarily the intravascular space, for up to several days. Colloids

have been used to increase the osmotic pressure in the intravascular space to increase vascular volume in critical situations. Colloids are either semi-synthetic, such as dextran, pentastarch, or hetastarch, or human plasma derivatives, such as albumin, plasma proteins, or blood. Recent evidence suggests that crystalloids are as effective as colloids and are less costly (Gonzales, 2008; Perel, 2011).

Vascular Access Devices. Vascular access devices (VADs) are catheters, cannulas, or infusion ports designed for repeated access to the vascular system. These devices include peripheral vascular access devices (PVADs) and central vascular access devices (CVADs) and allow for parenteral fluid and electrolyte replacement, parenteral nutrition, and administration of medications. Peripheral cannulas are selected for short-term use, while central venous catheters (CVCs), midline catheters, peripherally inserted central catheters (PICCs), tunneled catheters (e.g., Hickman), and implanted ports (Figure 39-11) are for long-term use or for administration of medications or solutions that are irritating to veins. Other reasons for use of CVADs are limited or poor peripheral veins, the need for good access to administer large volumes of fluid, and the need for reliable measurement of fluids (Kelly, 2009). CVADs have become an essential tool in contemporary nursing practice in acute care and community settings (Casey & Elliot, 2010, p. 78). The Registered Nurses' Association of Ontario (RNAO) (2005, 2008a) suggests that you play an important role in the education of patients and family in relation to VADs and decisions regarding device selection. You also play a role in continually evaluating the need and appropriateness of a VAD (Lavery & Smith, 2007). The recommendations and discussion that follows are general guidelines; however, you should be aware of, and follow, specific institutional and manufacturers policy.

Peripheral Vascular Access Devices: Nursing Considerations. Comprehensive assessment is the first step in initiating any intravenous therapy (Hamilton, 2006; Lavery & Smith, 2007) (see Skill 39-1, Steps 2 to 6). Many factors are involved in device selection, including safety concerns, treatment goals and duration, access to services such as home intravenous programs, and physical limitations. Effective communication,

Text continued on p. 970

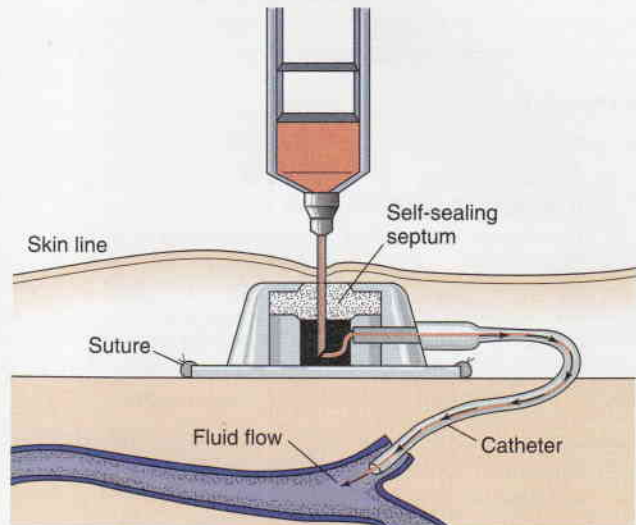


Figure 39-11 Cross-section of implantable port showing access of the port. **Source:** Perry, A. G., & Potter, P. A. (2010). *Clinical nursing skills and techniques* (7th ed., p. 772, Fig. 28-8,A). St Louis, MO: Mosby.

► SKILL 39-1 Initiating a Peripheral Intravenous Infusion

video

Delegation Considerations

In many provinces, monitoring intravenous therapy is included within the scope of practice for licensed and registered practical nurses. However, the delegating nurse is ultimately responsible for assessment and monitoring of the intravenous device. *The skill of initiating intravenous therapy should not be delegated to unregulated care providers (UCPs).* Other aspects of the patient's care may be delegated to UCPs. Instruct the UCP about the following:

- To inform the nurse if the patient complains of burning sensation, bleeding, swelling, or coolness at the catheter insertion site
- The prescribed flow rate and to report if the rate has slowed or increased
- To inform the nurse if the intravenous dressing becomes wet or if an electronic infusion device (EID) sounds
- To inform the nurse if the volume of fluid in the intravenous bag is low

Equipment

- Correct intravenous solution
- Proper catheter for venipuncture (the gauge will vary with the patient's body size and the reason for intravenous fluid administration). Select the smallest gauge and shortest length possible.
- Intravenous start kit (if available): may contain a sterile drape to place under the patient's arm, a tourniquet, cleansing and antiseptic preparations, dressings, and a small roll of sterile tape
- Local anaesthetic (optional)

For Intravenous Fluid Infusion

- Administration set (the choice depends on the type of solution and the rate of administration; infants and children, patients with cardiac or renal disease, and certain medications require microdrip tubing, which provides 60 gtt/mL)
- 0.22- μ m filter (if required by agency policy or if particulate matter is likely; the size appropriate to the type of solution)
- Extension tubing (used when a longer intravenous line is necessary or to avoid manipulation of the catheter insertion site with frequent tubing changes)
- Antiseptic swabs or sticks (chlorhexidine, povidone-iodine, alcohol)
- Disposable gloves

Continued

► SKILL 39-1 Initiating a Peripheral Intravenous Infusion—cont'd



- Tourniquet (Determine the type of tourniquet on the basis of the patient assessment, e.g., a blood pressure [BP] cuff [older adult] or a rubber band [infants]. Tourniquets can be a source of contamination; use a single-use product.)
- Nonallergenic tape and sterile tape (for use under the dressing)
- Waterproof pad (to place under patient's hand or arm)
- Intravenous pole
- Special patient gown with snaps at shoulder seams if available (makes removal with intravenous tubing easier)
- Needle disposal container (also called sharps container)
- Intravenous site protection device (optional)

For Normal Saline Lock

- Injection cap (also called intravenous plug, adapter)
- Intravenous loop or short piece of extension tubing
- 1 to 3 mL of sterile normal saline
- Needleless access device, or syringes and 25-gauge needles

Gauze Dressing Only

- 2 × 2 (5 cm × 5 cm) or 4 × 4 (10 cm × 10 cm) sterile gauze sponge
- Sterile tape

Transparent Dressing Only

- Transparent dressing

Procedure

STEPS

1. Review physician's order for type and amount of intravenous fluid, rate of fluid administration, and purpose of infusion. Follow seven rights for administration of medications (see Chapter 33).

RATIONALE

- An order requesting the initiation of a peripheral intravenous access and administration of an intravenous solution must be made by a physician before implementation of this procedure. Nurses assist in decision making for selection of appropriate access device.

Critical Decision Point: Health care providers do not write orders to "initiate peripheral access" or "perform venipuncture." "Start IV" may be written, followed by the exact intravenous therapy order. The order to perform venipuncture is implied. If the order is confusing or in question, clarify it with the health care provider before proceeding.

2. Observe for signs and symptoms indicating fluid or electrolyte imbalances that may be affected by intravenous fluid administration:

A. Peripheral edema

B. Greater than 20% change in body weight

C. Dry skin and mucous membranes

D. Distended neck veins

E. BP changes

F. Irregular pulse rhythm; tachycardia

G. Auscultation of abnormal lung sounds

H. Decreased skin turgor. Skin fails to return to normal position in three seconds after pinching.

- Provides baseline data for later evaluation of change in fluid and electrolyte status.
- Indicates expanded interstitial fluid volume, evident in dependent body parts (e.g., feet and ankles). Excess intravenous fluids will worsen this condition.
- Daily weights assist in documenting fluid retention or loss. Change in body weight of 1 kg corresponds to 1 L of fluid retention or loss.
- Frequently associated with FVD.
- Frequently associated with FVE or cardiovascular alterations.
- Elevations in BP may indicate volume excess, and decreased pressure may indicate FVD. These changes can be more sudden and pronounced in those patients with underlying cardiopulmonary disease.
- Rate and rhythm change can occur with changes in intravascular volume, as well as changes in potassium, calcium, or magnesium. Tachycardia may indicate cardiac compensation for reduced circulating volume, whereas irregular pulse may indicate arrhythmias secondary to electrolyte imbalance.
- With FVE, the cardiovascular system is unable to compensate for this excess and fluid builds up in the lungs, creating abnormal lung sounds, such as crackles.
- With decreased fluid volume, the skin when pinched remains in that state for several seconds. This is called "tenting."

Critical Decision Point: Changes in skin turgor are a less reliable indicator for older adult patients because of the natural loss in skin elasticity caused by the normal aging process.

I. Thirst

J. Anorexia, nausea, and vomiting

K. Decreased urine output

L. Behavioural changes

- Symptomatic of FVD. Very young, confused, and severely debilitated patients may not be able to indicate their thirst.
- May be present with FVE or FVD. These symptoms may also be present with the patient's underlying disease.
- During dehydration, the kidneys attempt to restore fluid balance by reducing urine production.
- May occur with FVD and acid-base imbalance. In addition, behavioural changes may be due to fever, the underlying condition, or preexisting disease.

► SKILL 39-1 Initiating a Peripheral Intravenous Infusion—cont'd

video

3. Assess patient's previous or perceived experience with intravenous therapy and arm placement preference (Lavery & Smith, 2007).
 4. Determine whether patient is to undergo any planned surgeries or is to receive blood infusion later.
 5. Assess laboratory data and patient's history of allergies.
 6. Assess for the following risk factors: child or older adult, presence of heart failure or renal failure, or low platelet count.
 7. Prepare patient and family by explaining the procedure, its purpose, and what is expected of the patient.
 8. Perform hand hygiene.
 9. Assist patient to comfortable sitting or supine position.
 10. Organize equipment on clean, clutter-free bedside stand or overbed table.
 11. Change patient's gown to the more easily removed gown with snaps at the shoulder, if available.
 12. Check intravenous solution, using the rights of drug administration (see Chapter 33). Make sure prescribed additives, such as potassium and vitamins, have been added. Check solution for colour, clarity, and expiration date. Check bag for leaks, which is best if done before reaching the bedside.
 13. Open sterile packages using sterile aseptic technique.
 14. Open the infusion set, maintaining sterility of both ends of tubing. Many sets allow for priming of tubing without removal of end cap.
 15. Place roller clamp about 2 to 5 cm below drip chamber and move roller clamp to closed position (see Step 15 illustrations).
- Determines level of emotional support and instruction necessary. If hypersensitive to venipunctures, a local anaesthetic may be indicated. The local anaesthetic needs to be applied 5–10 minutes prior to insertion (Lehne, 2010).
 - Allows nurse to select catheter gauge, and avoids placement in an area that will interfere with medical procedures.
 - May reveal information that affects insertion of devices, such as FVD, anemia, or allergy to iodine, adhesive, or latex.
 - Fluid imbalances develop more rapidly in extremely young patients (infants) and older patients because such patients have proportionately larger ECF volume, patients with heart failure may require fluid restriction and cannot adapt to sudden increases in vascular volume, and patients with renal failure cannot eliminate excess ECF. A low platelet count predisposes patients to bleeding at intravenous site.
 - Decreases anxiety and promotes cooperation.
 - Reduces transmission of microorganisms.
 - Enables patient to extend arm.
 - Reduces risk of contamination and accidents.
 - Use of a special intravenous gown facilitates safe removal of the gown.
 - Intravenous solutions are medications and should be carefully checked to reduce the risk of error. Solutions that are discoloured, contain particles, or are expired are not to be used. (Some solutions may have slight discolouration [e.g., be pink-tinged] and still be suitable for use.) Leaky bags present an opportunity for infection and must not be used.
 - Maintains sterility of equipment and reduces spread of microorganisms.
 - Prevents bacteria from entering infusion equipment and bloodstream.
 - Close proximity of roller clamp to drip chamber allows more accurate regulation of flow rate. Moving clamp to closed position prevents accidental spillage of fluid.



Step 15 A, Roller clamp in open position. B, Roller clamp in closed position.

Continued

► SKILL 39-1 Initiating a Peripheral Intravenous Infusion—cont'd

video

16. Remove protective sheath over intravenous bag port (see Step 16 illustration). For bottled intravenous solution, remove metal cap and metal and rubber discs beneath cap. Use caution to avoid touching exposed opening.
 17. Insert infusion set into fluid bag or bottle by removing protector cap from tubing insertion spike (keeping spike sterile) and inserting spike into opening of intravenous bag (see Step 17 illustration). Cleanse rubber stopper on glass-bottled solution with antiseptic and insert spike into black rubber stopper of intravenous bottle. Hang solution container on intravenous pole at a minimum height of 90 cm above planned insertion site.
- Provides access for insertion of infusion tubing into solution.
 - Prevents contamination of solution from contaminated insertion spike.
 - Container heights of approximately 1 m are usually sufficient to overcome venous pressure and other resistance from tubing and catheter.



Step 16 Removing protective sheath from intravenous bag port.

Source: Perry, A. G., & Potter, P. A. (2010). *Clinical nursing skills and techniques* (7th ed., p. 747, Skill 28-1, Step 7d). St Louis, MO: Mosby.



Step 17 Inserting spike into intravenous bag. **Source:** Perry, A. G., & Potter, P. A. (2010). *Clinical nursing skills and techniques* (7th ed., p. 747, Skill 28-1, Step 7e). St Louis, MO: Mosby.

18. Compress drip chamber and release, allowing it to fill one-third to one-half full (see Step 18 illustration). Open clamp and prime infusion tubing by filling with intravenous solution, carefully inverting valves and ports in sequence as the solution moves through the tubing.
 19. Remove tubing protector cap (some tubing can be primed without removal) and slowly release roller clamp to allow fluid to travel from drip chamber through tubing to needle adapter. Return roller clamp to closed position after tubing is primed (filled with intravenous fluid).
- Creates vacuum effects; fluid enters drip chamber to prevent air from entering tubing. By inverting valves and ports, you allow them to fill with fluid, minimizing air bubbles.
 - Slow filling of tubing decreases turbulence and chance of bubble formation. Removes air from tubing and permits tubing to fill with solution. Closing the clamp prevents accidental loss of fluid.

► SKILL 39-1 Initiating a Peripheral Intravenous Infusion—cont'd



20. Be certain tubing is clear of air and air bubbles. To remove small air bubbles, firmly tap intravenous tubing where air bubbles are located. Check entire length of tubing to ensure that all air bubbles are removed (see Step 20 illustration).

- Large air bubbles can act as emboli. Air bubbles may contribute to anxiety related to intravenous therapy and may cause EID to alarm increasing anxiety further.



Step 18 Squeezing drip chamber to fill with fluid. **Source:** Perry, A. G., & Potter, P. A. (2010). *Clinical nursing skills and techniques* (7th ed., p. 747, Skill 28-1, Step 7f). St Louis, MO: Mosby.



Step 20 Removing air bubbles from tubing. **Source:** Perry, A. G., & Potter, P. A. (2010). *Clinical nursing skills and techniques* (7th ed., p. 747, Skill 28-1, Step 7h). St Louis, MO: Mosby.

Critical Decision Point: Do not touch spike. It is sterile. If contamination occurs (e.g., spike is accidentally dropped on the floor), then discard intravenous tubing and obtain a new one.

Critical Decision Point: Extra extension tubing may be added to intravenous tubing to allow for more length, which will enable the patient to move more freely while still keeping the intravenous line stable. But remember, adding extensions increases risk for infection.

21. Replace tubing cap protector on end of tubing.
22. *Optional:* Prepare normal saline lock for infusion. If a loop or short extension tubing is needed, use sterile technique to connect the intravenous plug to the loop or short extension tubing. Inject 1 to 3 mL normal saline through the plug and through the loop or short extension tubing.
23. Apply disposable gloves. Eye protection and mask may be worn (see agency policy) if splash or spray of blood is possible. *Note:* Gloves can be left off to locate vein but must be applied before preparing site.

- Maintains system sterility.
- Priming the extension tubing and plug prevents introduction of air into the vein.
- Reduces transmission of microorganisms. Decreases exposure to HIV, hepatitis, and other bloodborne organisms (Infusion Nurses Society [INS], 2006).

Critical Decision Point: Do not shave area with a razor. Shaving may cause microabrasions and predispose patient to infection. Clipping excess hair is appropriate (RNAO, 2008b).

24. Identify accessible vein for intravenous placement. Apply tourniquet 10 to 15 cm above the proposed insertion site (see Step 24 illustration). Position tourniquet so that ends are away from proposed venipuncture site. Check for presence of radial pulse. *Option:* Apply BP cuff instead of tourniquet. Inflate to a level just below patient's normal diastolic pressure. Maintain inflation at that pressure until venipuncture is completed.

- Tourniquet should be tight enough to impede venous return but not occlude arterial flow.

Continued

► SKILL 39-1 Initiating a Peripheral Intravenous Infusion—cont'd

video

25. Select the vein. Common intravenous sites for the adult include cephalic, basilic, and median cubital veins (see Figure 39-13).
- Use the most distal site in the nondominant arm, if possible.
 - Avoid areas that are painful to palpation.
 - Select a vein large enough for catheter placement.
 - Choose a site that will not interfere with patient's activities of daily living or planned procedures.
 - Use the fingertips to palpate the vein by pressing downward and noting the resilient, soft, bouncy feeling as the pressure is released (see Step 25E illustration).

- Venipuncture should be performed distal to proximal, which increases the availability of other sites for future intravenous therapy.
- May indicate inflamed vein.
- Prevents interruption of venous flow while allowing adequate blood flow around the catheter.
- Selection of an appropriate site will minimize risk of injury and loss of the IV.
- Fingertips are more sensitive and are better to assess vein condition.



Step 24 Apply tourniquet. **Source:** Perry, A. G., & Potter, P. A. (2010). *Clinical nursing skills and techniques* (7th ed., p. 748, Skill 28-1, Step 10). St Louis, MO: Mosby.



Step 25E Palpate vein for resilience.

- Promote venous distension by instructing the patient to open and close the fist several times, lowering the patient's arm in a dependent position, applying warmth to the arm for several minutes, and rubbing or stroking the patient's arm from distal to proximal below proposed site.

- These activities increase blood flow to the area of insertion. When these techniques are properly used, they foster venous dilation and access to the vein.

Critical Decision Point: Avoid vigorous rubbing and multiple tapping of patient's veins. These techniques may cause injury to the vein, such as a hematoma, or cause venous constriction.

- Avoid sites distal to previous venipuncture site, sclerosed or hardened cordlike veins, infiltrated site or phlebotic vessels, bruised areas, and areas of venous valves or bifurcation. Avoid veins in antecubital fossa and ventral surface of the wrist.
 - Avoid fragile dorsal veins in older adults and vessels in an extremity with compromised circulation (e.g., in cases of mastectomy, dialysis graft, or paralysis).
26. Release tourniquet temporarily and carefully. Clip arm hair with scissors (if necessary). Do not shave area.
- Such sites increase the risk of infiltration of newly placed intravenous line and excessive vessel damage.
 - Veins in the antecubital fossa are used for blood draws, and placement in this area limits mobility. Inner wrist contains numerous tendons that could be damaged.
 - Venous alterations can increase risk of complications (e.g., infiltration and decreased catheter dwelling time).
 - Hair impedes venipuncture and adherence of dressing. Shaving can cause microabrasions and predispose patient to infection.

► SKILL 39-1 Initiating a Peripheral Intravenous Infusion—cont'd

27. (If area of insertion appears to need cleansing, use soap and water first.) Cleanse insertion site using firm, circular motion (centre to outward) in concentric circles 5–7.5 cm from insertion site. Use antiseptic preparation as a single agent or in combination, according to agency policy. Two percent chlorhexidine gluconate is the antiseptic cleansing agent of choice. Povidone-iodine is a topical anti-infective agent that reduces skin surface bacteria; 70% alcohol is another antiseptic cleansing agent. Povidone-iodine must dry to be effective in reducing microbial counts. Avoid touching the cleansed site. Allow the site to dry for at least two minutes (see Step 27 illustration). If skin is touched after cleansing, repeat cleansing procedure (Lavery & Ingram, 2006).



Step 27 Cleanse site chosen for insertion. **Source:** Perry, A. G., & Potter, P. A. (2010). *Clinical nursing skills and techniques* (7th ed., p. 750, Skill 28-1, Step 16). St Louis, MO: Mosby.

28. Reapply tourniquet or BP cuff.

Critical Decision Point: Do not use povidone-iodine if the patient is allergic to iodine; use an alternative cleansing agent.

29. Perform venipuncture. Anchor vein by placing thumb over vein beneath insertion site and by stretching the skin against the direction of insertion 5 to 7.5 cm distal to the site (see Step 29 illustration). Warn patient of a sharp stick. Puncture skin and vein, holding catheter at 10- to 30-degree angle with the bevel pointed upward.

- A. Butterfly needle:** Hold needle at 10- to 30-degree angle with bevel up slightly distal to actual site of venipuncture.
B. Needleless safety device: Insert device (see Step 29B illustration) with bevel up at 10- to 30-degree angle slightly distal to actual site of venipuncture in the direction of the vein.



Step 29 Stabilize vein below insertion site with skin taut. **Source:** Perry, A. G., & Potter, P. A. (2010). *Clinical nursing skills and techniques* (7th ed., p. 750, Skill 28-1, Step 18). St Louis, MO: Mosby.

- Air-drying prevents chemical reactions between agents and allows time for maximum microbicidal activity of agents (INS, 2006).
- Touching the cleansed area would introduce organisms from nurse's hand to the site.

- The vascular access device selected should be the smallest gauge and shortest length that will accommodate the therapy (INS, 2006).
- Places needle parallel to vein. When vein is punctured, risk of puncturing posterior vein wall is reduced.
- Superficial veins require a smaller angle; deeper veins require a greater angle.



Step 29B Puncture skin with catheter and enter the vein. **Source:** Perry, A. G., & Potter, P. A. (2010). *Clinical nursing skills and techniques* (7th ed., p. 750, Skill 28-1, Step 18a). St Louis, MO: Mosby.

Continued

► SKILL 39-1 Initiating a Peripheral Intravenous Infusion—cont'd

video

Critical Decision Point: No more than two attempts at inserting an intravenous line should be made by a single nurse (INS, 2006).

30. Look for blood return through tubing of butterfly needle or flashback chamber of ONC, indicating that needle has entered vein (see Step 30 illustration, part A). Lower catheter or needle until almost flush with skin. Advance butterfly needle or loosen stylet and advance ONC until hub is near the insertion site (see Step 30 illustration, part B). Do not reinsert the stylet once it is loosened.

- Increased venous pressure from tourniquet increases backflow of blood into catheter or tubing.
- Lowering the angle and advancing the cannula slightly allow for full penetration of vein wall, placement of catheter within vein's inner lumen, and easy advancement of catheter off stylet.
- Threading catheter up to hub reduces the risk of introduction of infectious organisms along the catheter length. Reinsertion of the stylet can cause catheter damage and potential catheter embolization.
- Techniques for retracting stylet vary with each IV device.



Step 30 A, Blood return in flashback chamber, catheter lowered flush with skin. B, Advance catheter into vein; use safety device push-tab. **Source:** Perry, A. G., & Potter, P. A. (2010). *Clinical nursing skills and techniques* (7th ed., p. 751, Skill 28-1, Step 19b). St Louis, MO: Mosby.

31. Stabilize the catheter. Apply gentle but firm pressure with the index finger of nondominant hand 3 cm above insertion site. Release tourniquet or BP cuff with dominant hand and retract stylet from ONC. Do not recap the stylet. For a safety device, slide the catheter off the stylet while gliding the protective guard over the stylet. A click indicates the device is locked over the stylet.
32. Quickly connect adapter of primed fluid administration set or saline lock to hub of ONC or butterfly tubing. Be sure connection is secure. Do not touch point of entry of adapter.
- 33A. Release roller clamp slowly to begin infusion at a rate to maintain patency of intravenous line.
- 33B. **Intermittent infusion:** Continue to stabilize catheter with nondominant hand and attach injection cap of adapter. Insert prefilled flush solution into injection cap. Flush slowly (see Step 33B illustration). Maintain thumb pressure on syringe during withdrawal or close clamp on extension tubing of injection cap while still flushing last 0.2–0.4 mL of flush solution.

- Permits venous flow, reduces backflow of blood, and prevents accidental withdrawal or dislodgement.
- Prompt connection of infusion set maintains patency of vein.
- Maintains sterility.
- Permits venous flow and prevents clotting of vein and obstruction of flow of intravenous solution.
- Positive pressure in the catheter prevents reflux of blood into the catheter lumen (Phillips, 2005).



Step 33B Flush injection cap slowly. **Source:** Perry, A. G., & Potter, P. A. (2010). *Clinical nursing skills and techniques* (7th ed., p. 752, Skill 28-1, Step 22). St Louis, MO: Mosby.

SKILL 39-1 Initiating a Peripheral Intravenous Infusion—cont'd



Critical Decision Point: Be sure to calculate rate so as not to infuse intravenous solution too rapidly or too slowly.

34. Tape or secure catheter (see Step 34 illustration).

A. If applying transparent dressing, secure catheter with nondominant hand while preparing to apply dressing. Tape over catheter hub (see Step 34A illustration).



Step 34 Catheter stabilization device. **Source:** Courtesy of C. R. Bard, Inc. From Perry, A. G., & Potter, P. A. (2010). *Clinical nursing skills and techniques* (7th ed., p. 752, Skill 28-1, Step 23a). St Louis, MO: Mosby.

B. If applying a gauze dressing:

- (1) Tape the intravenous catheter as with Step 34A. Avoid applying tape around the extremity.

36. Observe site for swelling.

37. Apply sterile dressing over site.

A. Transparent dressing

- (1) Carefully remove adherent backing. Apply one edge of dressing and then gently smooth remaining dressing over site, leaving connection between IV tubing and the end of catheter hub uncovered (see Step 37A[1] illustration).
- (2) Tape with a 2.5 cm width tape over IV tubing or extension set. Do not apply tape over transparent dressing (see Step 37A2 illustration).



Step 37A(1) Apply transparent dressing. **Source:** Perry, A. G., & Potter, P. A. (2010). *Clinical nursing skills and techniques* (7th ed., p. 753, Skill 28-1, Step 25a[1]). St Louis, MO: Mosby.

- Securing the catheter and tubing prevents movement and tension on the device, reducing mechanical irritation and possible phlebitis or infection. Procedures for taping and securing catheter vary with devices and with agency policy. Catheter stabilization device, transparent dressing or tape, and gauze are three common options. Manufacturer provided catheter stabilization devices reduce the risk of complications from PVAD (Rosenthal, 2007).



Step 34A Tape over catheter hub. **Source:** Perry, A. G., & Potter, P. A. (2010). *Clinical nursing skills and techniques* (7th ed., p. 752, Skill 28-1, Step 23c). St Louis, MO: Mosby.

- Tape placed underneath the dressing should be sterile; nonsterile tape is a potential source of pathogenic bacteria.
- Taping around extremity could result in a “tourniquet effect” and impede venous return.
- Any swelling suggests the catheter has been dislodged or was unsuccessfully inserted and must be removed.

- Transparent dressings are occlusive to moisture and microorganisms. Transparent dressings allow continuous inspection of the intravenous site, are more comfortable, and permit patients to bathe and shower without saturating the dressing.



Step 37A(2) Place tape over transparent dressing. **Source:** Perry, A. G., & Potter, P. A. (2010). *Clinical nursing skills and techniques* (7th ed., p. 753, Skill 28-1, Step 25a[2]). St Louis, MO: Mosby.

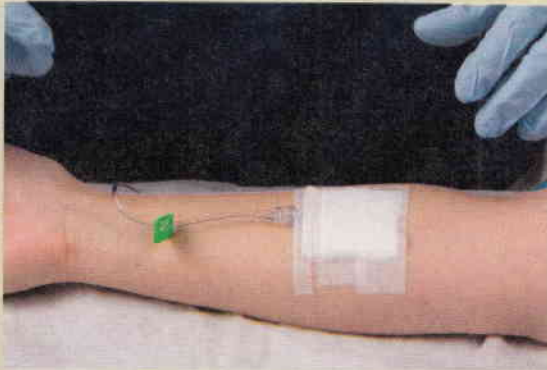
Continued

► SKILL 39-1 Initiating a Peripheral Intravenous Infusion—cont'd

video

B. Sterile gauze dressing

- (1) Fold a $2 \times 3 \times 2$ gauze in half and cover with a 2.5 cm wide piece of sterile tape extending about 2.5 cm from each side. Place it under the tubing–catheter hub junction (see Step 37B[1] illustration).
- (2) Curl a loop of tubing alongside the arm and place a second piece of tape directly over the padded 2×2 gauze, securing tubing in two places (see Step 37B[2] illustrations).



Step 37B(1) Place 2×2 gauze over insertion site and catheter hub.

Source: Perry, A. G., & Potter, P. A. (2010). *Clinical nursing skills and techniques* (7th ed., p. 753, Skill 28-1, Step 25b[1]). St Louis, MO: Mosby.

- Tape on top of tape makes it easier to access hub–tubing junction. Securing loop of tubing reduces risk of dislodging catheter from accidental pull.
- Gauze is less expensive than transparent dressing and may also be useful for bleeding or excessive moisture at the site.



Step 37B(2) Apply 2×2 gauze dressing under tubing junction.

Source: Perry, A. G., & Potter, P. A. (2010). *Clinical nursing skills and techniques* (7th ed., p. 753, Skill 28-1, Step 25b[2]). St Louis, MO: Mosby.

38. Secure tubing. Curl a loop of tubing along the arm and place a second piece of 2.5 cm tape over the tubing to secure (see Step 38 illustration).

39. Prepare the equipment according to expected frequency of use.

A. For intravenous fluid administration: Adjust flow rate to correct drops per minute or connect to EID (see Skill 39-2, Steps 9 to 15).

B. For intermittent use: Saline lock. Flush with 3 mL of sterile normal saline at prescribed frequency or agency policy.

40. Label dressing with date, time, gauge size and length of catheter, and your initials (see Step 40 illustration).



Step 38 Loop and secure tubing. **Source:** Perry, A. G., & Potter, P. A. (2010). *Clinical nursing skills and techniques* (7th ed., p. 754, Skill 28-1, Step 26). St Louis, MO: Mosby.

- Maintains correct rate of flow for intravenous solution. Flow can fluctuate; therefore, it must be checked at intervals.
- Maintains patency of intravenous catheter. While some authors recommend heparin lock, the RNAO (2008b recommends use of saline for flushing and locking peripheral short catheters, after each use and daily if not in use.
- Allows for easy recognition of type of device and time interval for site rotation.



Step 40 Label IV dressing. **Source:** Perry, A. G., & Potter, P. A. (2010). *Clinical nursing skills and techniques* (7th ed., p. 754, Skill 28-1, Step 28). St Louis, MO: Mosby.

41. Dispose of used needles in appropriate sharps container. Discard supplies. Remove gloves and perform hand hygiene.

- Reduces transmission of microorganisms and protects staff from injury.

► SKILL 39-1 Initiating a Peripheral Intravenous Infusion—cont'd



42. Observe patient every hour to determine whether fluid is infusing correctly:
 - A. Check whether correct amount of solution is infused as prescribed by looking at time tape.
 - B. Count flow rate or check rate on infusion pump.
 - C. Check patency of intravenous catheter or needle.
 - D. Observe patient for signs of discomfort.
 - E. Inspect insertion site for absence of phlebitis (see Table 39-7), infiltration (see Table 39-8), or inflammation.
 43. Document IV insertion including date, time, device selected (size, type, length, brand), site, number of attempts, name, and professional designation. A special parenteral therapy flow sheet may be used. Record patient's response to intravenous fluid, amount infused, and integrity and patency of system every four hours or according to agency policy.
 44. Observe patient every hour to determine response to therapy (i.e., measure vital signs, conduct postprocedure assessments).
- Correct administration of fluid volume prevents fluid imbalance.
 - Accurate monitoring of rate further ensures correct volume administration.
 - Precise description of insertion site is important for future consideration of sites.
 - Evaluation of parenteral therapy is an important part of the nursing process.
 - Provides continuous evaluation of type and amount of fluid delivered to patient. Hourly inspection prevents accidental fluid overload or inadequate infusion rate and identifies early incidence of vein inflammation or tissue damage. Intravenous fluids and additives are given to maintain or restore fluid and electrolyte balance. They can also cause unexpected effects, which can be serious.

Unexpected Outcomes

FVD, as manifested by decreased urine output, dry mucous membranes, hypotension, and tachycardia

FVE, as manifested by crackles in lungs, shortness of breath, and edema

Electrolyte imbalances, as manifested by abnormal serum electrolyte levels; changes in mental status, neuromuscular function, and vital signs; and other signs and symptoms

Infiltration, as indicated by swelling and possible pitting edema, pallor, coolness, pain at insertion site, and possible decrease in flow rate

Phlebitis, as indicated by pain, increased skin temperature, and erythema along path of vein

Bleeding at venipuncture site

Related Interventions

- Notify physician; may require readjustment of infusion rate.
- Reduce intravenous flow rate if symptoms appear and notify physician.
- Notify physician. Additives in intravenous or type of intravenous fluid may be adjusted.
- Stop infusion and discontinue intravenous therapy. Elevate affected extremity. Restart new intravenous line if continued therapy is necessary.
- Stop infusion and discontinue intravenous therapy. Restart new intravenous line if continued therapy is necessary.
- Place moist, warm compress over area of phlebitis.
- Bleeding from vein is usually slow, continuous seepage. Common in patients who have received heparin or have a bleeding disorder or if the intravenous site is over bend in arm or hand.
- If bleeding occurs around venipuncture site and catheter is within vein, gauze dressing may be applied over site. Eventually, intravenous therapy may need to be discontinued.
- Blood on the dressing can result when the administration set becomes disconnected from the catheter's hub. When blood appears on the dressing, verify that the system is intact and change the dressing.

Reporting

- Report the following to oncoming nursing staff: type of fluid, flow rate, status of venipuncture site, amount of fluid remaining in present solution, expected time to hang next intravenous bag or bottle, and any side effects.

Home Care Considerations

- Teach patient and family about hand hygiene and aseptic technique for all care related to the intravenous site and equipment.
- Teach caregiver to apply pressure with sterile gauze if catheter falls out and, if patient is on anticoagulant therapy, to tape several pieces of sterile gauze in place for at least 20 minutes with pressure or until bleeding stops.
- Teach patient and caregiver to perform tub bath without getting intravenous tubing wet and to unplug pump first if one is used. For showering, the patient must protect the intravenous site and dressing from getting wet by covering them completely with plastic.
- Teach patient and family to monitor intake and output using measuring devices.
- Teach patient and family to dispose of open and sheathed needles into sharps container. All sharps containers must be stored in safe area away from children.

► TABLE 39-7 Phlebitis Scale

Grade	Clinical Criteria
0	No symptoms
1	Erythema at access site with or without pain
3	Pain at access site with erythema, edema, or both Streak formation Palpable venous cord
4	Pain at access site with erythema, edema, or both Streak formation Palpable venous cord 2 cm in length Purulent drainage

Source: Infusion Nurses Society. (2006). Infusion nursing standards of practice. *Journal of Infusion Nursing*, 29(1 Suppl.), S59.

► TABLE 39-8 Infiltration Scale

Grade	Clinical Criteria
0	No symptoms
1	Skin blanched Edema, 2.5 cm in any direction Cool to touch With or without pain
2	Skin blanched Edema 2.5–15.2 cm in any direction Cool to touch With or without pain
3	Skin blanched, translucent Gross edema 15.2 cm in any direction Cool to touch Mild to moderate pain Possible numbness
4	Skin blanched, translucent Skin tight, leaking Skin discoloured, bruised, swollen Gross edema 15.2 cm in any direction Deep pitting tissue edema Circulatory impairment Moderate to severe pain Infiltration of any amount of blood product, irritant, or vesicant

Source: Infusion Nurses Society. (2006). Infusion nursing standards of practice. *Journal of Infusion Nursing*, 29(1 Suppl.), S60.

allowing time for questions, and education regarding the signs of complications are important to preventing and managing risks (Lavery & Smith, 2007).

Insertion and management of a PVAD is now considered a routine nursing responsibility and skill. The management of PVADs requires careful monitoring of the site, patency, and dressing. The site should be assessed for infiltration and phlebitis (Groll et al., 2010) (Table 39-7 and 39-8). Most treatments requiring intravenous access for more than one week are best suited to midline, PICC, or implanted ports (RNAO, 2008b). Scales to assess for phlebitis and infiltration are important tools for nurses initiating and managing PVADs (Box 39-10).

Central Vascular Access Devices: Nursing Considerations. A CVAD is a venous access device with a tip that terminates in a great vessel, preferably in the lower third of the

* BOX 39-10 RESEARCH HIGHLIGHT

Using Phlebitis and Infiltration Scales for Assessing PVAD

Research Focus

Phlebitis and infiltration are common complications related to IV therapy. Two scales, developed by the Infusion Nurses Society (INS), are used to assess the extent of these complications. A study was done by a team of Canadian researchers to evaluate the scales to evaluate the scales' reliability, validity, and ease of use.

Research Abstract

The study used observation in a hospital setting and with a home nursing agency, for a total of 182 participants and 416 observations. Each participant was observed up to four times by two observers. The participants' charts were also audited. The research nurses used a data collection tool and observation form for each participant. The study evaluated the phlebitis and infiltration scales for four properties: acceptability, feasibility, reliability, and validity. The researchers concluded that the scales are easy to use and did not take long to complete. The scales were reliable and valid in both settings. The researchers also found that nurses who used the tools identified more cases of phlebitis and infiltration than was recorded in the participants' charts. These findings support the use of the INS Phlebitis and Infiltration Scales in a variety of settings.

Evidence-Informed Practice

Nurses in all settings are positioned to assess for complications related to PVADs.

Scales to assess for phlebitis and infiltration are important tools for nurses initiating and managing PVADs.

Reference: Groll, D., Davies, B., Mac Donald, J., Nelson, S., & Virani, T. (2010). Evaluation of the psychometric properties of the phlebitis and infiltration scales for the assessment of complications of peripheral vascular access devices. *Journal of Infusion Nursing*, 33(6), 385–390.

superior vena cava; however, the upper right atrium is currently an acceptable site (Hadaway, 2008, p. 35). The catheters are available in a variety of lengths, sizes, and numbers of lumens and are often made of silicone or polyurethane. The most common insertion sites are the internal jugular and subclavian veins; the right internal jugular vein is considered the best option (Casey & Elliot, 2010, p. 80). Skin-tunnelled catheters (STC) are tunnelled from the entry site, subcutaneously, to the preferred vein, where the catheter is inserted and advanced into the superior vena cava (Green, 2008, p. 44). PICCs are inserted through a peripheral vein, such as the basilic, median cubital, or cephalic vein and terminate in the superior vena cava (Hamilton, 2006).

You need to be able to recognize the following complications: pneumothorax, arterial puncture, hemorrhage, cardiac tamponade, air embolus, hemothorax, nerve injury, hydrothorax, infection, catheter occlusion, and phlebitis. You also need to be aware of strategies to prevent these complications when caring for patients with a CVAD. Evidence-informed and vigilant nursing care is important on insertion and in the maintenance of all CVADs. Aseptic technique and diligent hand hygiene are essential for all aspects of care. Prior to insertion, chlorhexidine gluconate 2% in 70% isopropyl alcohol should be applied properly and allowed to dry. Maximal barrier precautions (including gown, mask, cap, and full drape) and ultrasound guided procedure are key recommendations for



insertion (Casey & Elliot, 2010, p. 82). Nurses must ensure that the tip placement or location has been verified and documented before the CVAD is used (Hadaway, 2008, p. 35). Finally, the date of insertion must be documented.

Maintenance recommendations are aimed at maintaining patency and preventing complications, specifically *catheter-related bloodstream infection* (CR-BSI). The manufacturer's stabilization device is preferred for PICCs and CVCs, although sterile tape or surgical strips can be used (Hadaway, 2008, p. 37). Sterile, transparent, semipermeable membrane dressings are recommended (Hadaway, 2008, p. 37). Sterile gauze and tape is accepted; however, it does not have the same advantages as transparent, semi-occlusive dressings, which allow for inspection and prevention of infection. Dressings are assessed daily or when they become wet, soiled, or loose. The new dressing will be labelled with the site, type of CVAD, length, date, time, and your initials. Gauze dressing may be changed as often as every 48 hours, and transparent dressing may be left intact for up to five to seven days. In the case of an STC, no dressing is required once the wound has healed unless the patient prefers one (Green, 2008, p. 45).

The external catheter should be measured and documented daily to ensure the catheter remains in the correct placement. The insertion site should be assessed daily for tenderness, signs of infection, erythema, warmth, and edema and should include palpation. The chest and neck should be accessed for engorged veins and for difficulty with movement. You would also assess for signs of systemic infection, such as fever, chills, and hypotension (Casey & Elliot, 2010, p. 78).

Prior to accessing a CVAD, Casey and Elliot (2010) recommend a 15-second rub with chlorhexidine. New antimicrobial devices and approaches to preventing CR-BSI are being developed and include antimicrobial catheters, needleless access devices, dressings, and lock solutions (Casey & Elliot, p. 84). To prevent occlusion of the CVAD, the device is flushed and assessed for patency according to institutional policy. The use of heparin for flushing and locking is currently an area for further study and future recommendations (e.g., Mitchell et al., 2009; RNAO, 2008a). Totally implantable ports, used for long-term treatment such as chemotherapy, are inserted surgically and are accessed by inserting a needle through the skin into the device. They can be used up to 2000 times (Kelly, 2009, p. s11) and have the lowest incidence of infection (Casey & Elliot, 2010, p. 80).

Patient and family education is required for all patients with a CVAD. Care requirements and restrictions should be included.

Administration of Intravenous Therapy

Types of Solutions. Many prepared intravenous solutions are available for use (Table 39-9). Solutions are classified as **hypertonic**, **isotonic**, or **hypotonic**. **Osmolarity**, reflecting the osmolar concentration in 1 L of solution (mOsm/L), is most often used to describe fluids outside the body (Hannon et al., 2010). A solution with the same osmolarity as blood plasma is called isotonic. A hypertonic solution, with a higher osmotic pressure, such as 3% sodium chloride, pulls fluid from cells, causing them to shrink. An isotonic solution, with the same osmotic pressure as plasma, such as 0.9% sodium chloride, expands the body's fluid volume without causing a fluid shift from one compartment to another. A hypotonic solution, with an osmotic pressure lower than plasma, such as 0.45% sodium chloride, moves fluid into the cells, causing them to enlarge. Each of these actions occurs through osmosis.

► TABLE 39-9 Intravenous Solutions

Solution	Concentration	Other Names
Dextrose in Water Solutions		
Dextrose 5% in water*	Isotonic	D5W
Dextrose 10% in water	Hypertonic	D10W
Saline Solutions		
0.45% sodium chloride (half normal saline)	Hypotonic	1.2 NS 0.45% NS
0.33% sodium chloride (one-third normal saline)	Hypotonic	1.3 NS
0.9% sodium chloride† (normal saline)	Isotonic	NS 0.9% NS 0.9% NaCl
3%–5% sodium chloride	Hypertonic	3%–5% NS 3%–5% NaCl
Dextrose in Saline Solutions		
Dextrose 5% in 0.9% sodium chloride	Hypertonic	D50.9% NaCl D50.9% NS D5NS
Dextrose 5% in 0.45% NaCl sodium chloride	Hypertonic	D50.45% NaCl D50.45% NS D51.2 NS
Multiple Electrolyte Solutions		
Lactated Ringer's solution‡	Isotonic	LR
Dextrose 5% in lactated Ringer's solution	Hypertonic	D5LR

*Dextrose is quickly metabolized, leaving free water to be distributed evenly in all fluid compartments (Heitz & Horne, 2005).

†Although it is isotonic because the total concentration of electrolytes equals plasma concentration, sodium chloride contains 154 mmol of both sodium and chloride, which is a higher concentration of these electrolytes than is found in the plasma, which can cause fluid volume excess (Heitz & Horne, 2005).

‡Contains sodium, potassium, calcium, chloride, and lactate.

In general, isotonic fluids are used most commonly for extracellular volume replacement (e.g., FVD after prolonged vomiting). The decision to use a hypotonic or a hypertonic solution is based on the specific fluid and electrolyte imbalances. For example, the patient with a hypertonic fluid imbalance will in general receive a hypotonic intravenous solution to dilute the ECF and rehydrate the cells. All intravenous fluids should be given carefully, especially hypertonic solutions, because these pull fluid into the vascular space by osmosis, resulting in an increased vascular volume that can lead to pulmonary edema, particularly in patients with heart or renal failure. Certain additives, most commonly vitamins and potassium chloride, are frequently added to intravenous solutions.

safety alert Under no circumstances should potassium chloride (KCl) be given by intravenous push. Direct intravenous infusion of KCl may cause death. If an intravenous fluid requires additives, a physician's order must specify the required additives: for example, "1000 mL D51/2 NS with 20 mmol/L KCl at 125 mL/hour."

Patients with normal renal function who are receiving nothing by mouth should have potassium added to intravenous solutions. The body cannot conserve potassium, and even when the serum level falls, the kidneys continue to excrete potassium. Without oral or parenteral potassium intake, hypokalemia can develop quickly. Conversely, you should verify that the patient has adequate renal function before administering an intravenous solution containing potassium because hyperkalemia can develop quickly.

Equipment. Correct selection and preparation of intravenous equipment are necessary for safe and quick placement of an intravenous line (Figure 39-12). Because fluids are instilled

into the bloodstream, sterile technique is necessary; have all equipment organized for efficient insertion (Skill 39-1). Intravenous cannulas are available in a variety of gauges. The larger the gauge, the smaller the diameter of the cannula is. These cannulas are plastic tubing threaded over a needle. Once the cannula is inserted into the vein, the needle is withdrawn, leaving the cannula in place. Intravenous tubing or an intermittent infusion device, such as a needleless port, is then connected. An electronic infusion pump as well as hourly visual monitoring of the cannulation site is recommended to prevent risks associated with peripheral venous access (Lavery & Smith, 2007, p. 1378).

safety alert Intravenous pumps or volume control devices ensure a prescribed rate of infusion. A prescribed rate of infusion is vital for children, patients with renal or cardiac failure, and critically ill patients. Electronic infusion devices must be used for medications that require precise rates of administration.

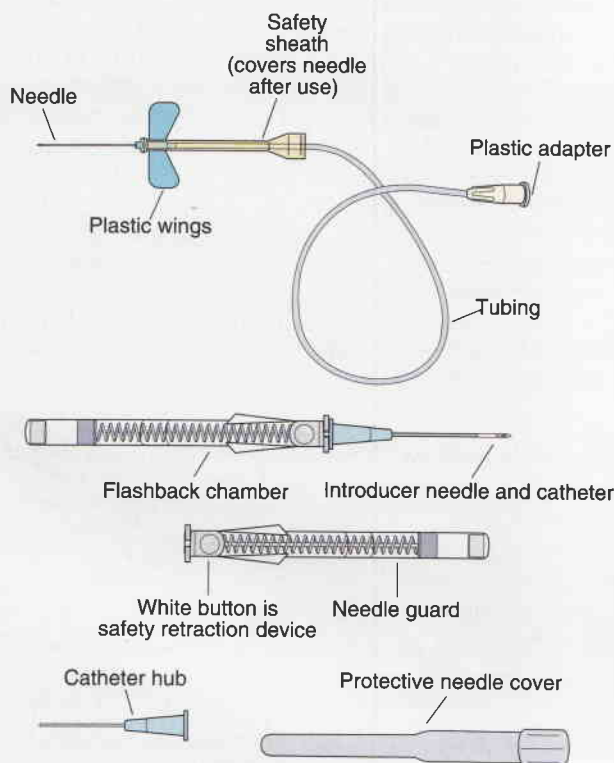


Figure 39-12 Options for intravenous access device.

Initiating an Intravenous Line. A venipuncture is a technique in which a vein is punctured through the skin by a sharp rigid stylet (e.g., butterfly needle or metal needle), a partially covered plastic catheter (over-the-needle catheter), or a needle attached to a syringe. When veins are fragile or collapse, venipuncture may become extremely difficult. For these difficult cases, venipuncture should be performed by an experienced, skilled practitioner. Skill 39-1 describes venipuncture for intravenous fluid infusion.

Venipuncture Site. After the equipment is collected at the bedside, prepare to place the intravenous line by assessing the patient for a venipuncture site (see Skill 39-1, Step 25A). Common intravenous puncture sites are the hand and the arm (Figure 39-13). The use of the foot for an intravenous site is common with children but is avoided in the adult because of the danger of thrombophlebitis (INS, 2006). Recent review of the literature does not currently support replacing a PVAD every 72 hours and instead supports this when clinically indicated; however, you will follow agency policy (Webster et al., 2010).

When assessing the patient for potential venipuncture sites for intravenous infusion, you should consider conditions and contraindications that exclude certain sites. Because children

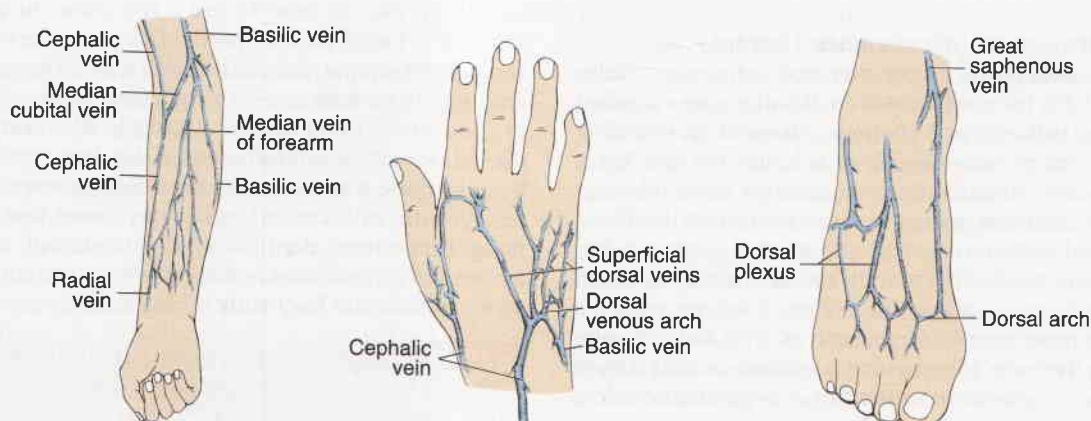


Figure 39-13 Common intravenous sites.

* BOX 39-11 FOCUS ON OLDER ADULTS

Protection of Skin and Veins

- Use the smallest gauge cannula or needle possible (e.g., 22 to 24 gauge). Veins are very fragile, and a smaller gauge allows better blood flow to provide increased hemodilution of the intravenous fluids or medications.
- Avoid the back of the hand, which may compromise the patient's need for independence and mobility.
- Impaired skin integrity may lead to susceptibility for tearing, venous sclerosis, and difficulty detecting complications.
- Avoid placement of an intravenous line in veins that are easily bumped because less subcutaneous support tissue is present.
- If the patient has fragile skin and veins, use minimal or no tourniquet pressure.
- After applying a tourniquet, venous pressure rises rapidly, the vein is overstretched, and puncture with even a thin needle can rupture the wall of the vein.
- If using a tourniquet, place it over the patient's sleeve to decrease shearing of fragile skin.
- With loss of supportive tissue, veins tend to lie more superficially; lower the insertion angle for venipuncture to 5 to 15 degrees (Coulter, 2004; INS, 2006; Rosenthal, 2005).
- If the patient has lost subcutaneous tissue, the veins lose stability and will roll away from the needle. To stabilize the vein, apply traction to the skin below the projected insertion site.
- Secure the device with mesh dressing or a securement device for protection (Coulter, 2004).
- Nutritional deficiencies promote fluid to migrate into tissues surrounding vessels, making intravenous access more difficult.
- Multiple medication usage (e.g., anticoagulants, antibiotics, and steroids) increases the likelihood of fragile, transparent skin that bruises and bleeds easily.
- Dehydration related to a lower percentage of body weight as water and diminished thirst mechanism contribute to difficult intravenous access (Rosenthal, 2005).



and older adults have fragile veins, you should avoid sites that are easily moved or bumped, such as those on the dorsal surface of the hand. Venipuncture is contraindicated in a site that has signs of infection, infiltration, or thrombosis. An infected site is red, tender, swollen, and possibly warm to the touch, and exudate may be present. An infected site is not used because of the danger of introducing bacteria from the skin surface into the bloodstream. Arms on the side of a mastectomy and extremities with an arteriovenous graft or fistula for dialysis should be avoided. It is important to place intravenous devices at the most distal point when possible as this allows for the use of proximal sites later if the patient needs a venipuncture site change. See Box 39-11 for guidelines related to the older adult.

Regulating the Infusion Flow Rate. After the intravenous infusion is secured and the line is patent, you must regulate the rate of infusion according to the prescriber's orders (Skill 39-2). An infusion rate that is too slow can lead to further cardiovascular and circulatory collapse in a critically ill patient. An intravenous fluid that is running too slowly can also clot

more easily. An infusion rate that is too rapid can result in FVE. Fluids that run by gravity are adjusted through use of a flow control or regulator clamp. Fluids infused by an electronic infusion device or rate controller are regulated by a mechanical mechanism set at the prescribed rate. Regardless of the device in use, the patient requires close monitoring to verify the correct infusion of the intravenous solution and to detect the occurrence of any complication.

Electronic infusion devices (EIDs) or infusion pumps are necessary when administering low hourly volumes (e.g., less than 20 mL/hour) and for patients who are at risk for volume overload, such as neonatal, pediatric, and geriatric patients. In addition, when infusing high volumes of intravenous fluids (more than 150 mL/hour) to patients with impaired renal clearance, older adults, or children, or when infusing drugs or intravenous fluids that require specific hourly volumes, electronic infusion devices permit accurate infusion. Electronic infusion devices deliver the infusion via positive pressure and have become standard in most settings. Recent advances in infusion technology have resulted in a variety of devices available for use to ensure accurate delivery.

Many devices have operating and programming capabilities that allow for single- and multiple-solution infusions at different rates. A variety of detectors and alarms respond to air in intravenous lines, completion of infusion, high and low pressure, low battery power, occlusion, and the inability to deliver at a preset rate.

safety alert An anti-free-flow safeguard (preventing bolus infusion in the event of machine malfunction) is an important element of an electronic infusion device and is required. The manufacturer's recommendations for specific device features should always be checked.

Patency of the intravenous needle or catheter means that the tip of the needle or catheter has no clots and that the catheter or needle tip is not against the vein wall. A blocked catheter or needle can affect the rate of infusion of the intravenous fluids. Intravenous flow rates can also be affected by infiltration, a knot or kink in the tubing, the height of the solution, a restrictive intravenous dressing, and the position of the patient's extremity. One way to assess patency is by lowering the intravenous bag below the level of the intravenous insertion site and observing for a blood return; however, this method does not confirm patency. If no blood return occurs and fluid does not flow easily from the drip chamber when the roller clamp is opened, you should assess potential causes: a clot may be occluding the cannula of the intravenous catheter, the catheter tip may be occluded against the wall of the vein, or the intravenous dressing may be too tight, thereby impeding the flow. The tubing and area around the insertion site should be inspected for anything that could obstruct the flow of intravenous fluids. A knot or kink in the tubing can decrease the flow rate. Occasionally, the tubing is kinked under a dressing; remove the dressing to locate the problem. The patient may also occlude the tubing by lying or sitting on it. The flow rate frequently resumes after the tubing is straightened. The height of the intravenous bag can also affect flow rates. Raising the bag usually increases the rate because of increased hydrostatic pressure.

The position of the extremity, particularly at the wrist or elbow, can decrease flow rates. Occasionally, the use of an arm

► SKILL 39-2 Regulating Intravenous Flow Rates**Delegation Considerations**

In many provinces, regulating and monitoring intravenous therapy is included within the scope of practice for licensed and registered practical nurses. The skill of regulating intravenous therapy should not be delegated to unregulated care providers (UCPs). Refer to Skill 39-1 for important information to instruct the UCP.

Procedure**STEPS**

1. Check patient's medical record for correct solution, additives, and time of infusion. Usual order includes solution for 24 hours, usually divided into 2 or 3 L. Occasionally, intravenous order contains only 1 L to keep vein open (KVO). Order also indicates time over which each litre is to infuse.

Critical Decision Point: It is common for health care providers to write an abbreviated intravenous order such as "D5W with 20 mmol KCl 125 mL/hr continuous." This order implies that the intravenous fluid should be maintained at this rate until order has been written for intravenous line to be discontinued.

2. Perform hand hygiene. Observe for patency of intravenous line and needle or catheter.
 - A. Open drip regulator and observe for rapid flow of fluid from solution into drip chamber and then close drip regulator to prescribed rate.
3. Check patient's knowledge of how positioning of the intravenous site affects flow rate.
4. Verify with patient how venipuncture site feels (e.g., determine whether the patient is experiencing pain or burning sensation).
5. Have paper and pencil or calculator to calculate flow rate or use calculator.
6. Know calibration (drop factor) in drops per millilitre (gtt/mL) of infusion set:
 - A. **Microdrip:** 60 gtt/mL
 - B. **Macrodrop:** 15 gtt/mL or 10 gtt/mL depending on manufacturer (will state on package)

Equipment

- Watch or clock with a second hand
- Paper and pencil or calculator
- Intravenous electronic infusion controller or pump (optional)
- Volume control device (optional)
- Time indicator tape for gravity infusions

RATIONALE

- Use principles of drug administration to ensure correct fluids are given to correct patient.

- For fluid to infuse at proper rate, intravenous line and needle must be free of kinks, knots, and clots.
- Rapid flow of fluid into drip chamber indicates patency of intravenous line. Closing drip chamber to prescribed rate prevents fluid overload.
- Fosters patient participation in maintaining most effective position of arm with intravenous equipment.
- Includes patient in decision making. Pain or burning sensation may be early indication of phlebitis.
- The beginning student is unfamiliar with intravenous fluid rates and should use mathematical calculations to obtain correct rate.
- Microdrip tubing, also called pediatric tubing, universally delivers 60 gtt/mL and is used when small or very precise volumes are to be infused. However, different commercial parenteral administration sets for macrodrip tubing are available. Macrodrop tubing should be used when large quantities or fast rates are necessary.

Critical Decision Point: Know which company's infusion set your agency uses.

7. Calculate flow rate (hourly volume) of prescribed infusion. Flow rate mL/hr = total infusion (volume in mL)/hours of infusion (time to be infused).
Example: 1000 mL/8 hr = 125 mL/1 hr
 8. Read physician's orders and follow seven rights for correct solution and proper additives.
 9. Intravenous fluids are usually ordered by rate, such as 100 mL/hr. However, occasionally, intravenous fluids are ordered over a period of time, such as 1000 mL D5W with 20 mmol KCl over 8 hr.
- Once hourly rate has been determined, these formulas give correct flow rate.
 - Intravenous fluids are medications; following seven rights decreases chance of medication error.
 - Determines volume of fluid that should infuse hourly.

► SKILL 39-2 Regulating Intravenous Flow Rates—cont'd



10. Place adhesive or fluid indicator tape on intravenous bottle or bag next to volume markings (see Step 10 illustration).

- Time taping intravenous bag gives visual cue as to whether fluids are being administered over correct period of time. Time tapes may be required for all intravenous infusions, including those on therapies infused via electronic infusion devices (EIDs). Check agency policy.

Critical Decision Point: Do not use felt-tipped pens or permanent markers on intravenous bags made of polyvinyl chloride because ink could contaminate the solution (Millam & Hadaway, 2003).

11. Select one of the following formulas to calculate minute flow rate (drops/min) on the basis of the drop factor of infusion set:

A. $\text{mL/hr} / 60 \text{ min} = \text{mL/min}$ and $\text{Drop factor} \times \text{mL/min} = \text{drops/min}$

B. Alternative: $\text{mL/hr} \times \text{drop factor} / 60 \text{ min} = \text{drops/min}$
Using formula B above, calculate minute flow rate for bottle 1: 1000 mL with 20 mmol KCl

Microdrip:

$$125 \text{ mL/hr} \times 60 \text{ gtt/mL} = 7500 \text{ gtt/hr}$$

$$7500 \text{ gtt} \div 60 \text{ minutes} = 125 \text{ gtt/min}$$

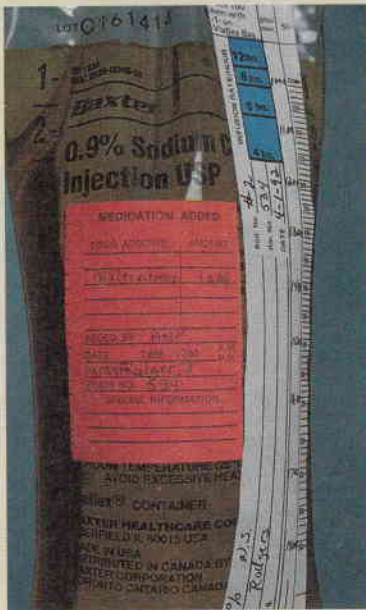
Macrodrop:

$$125 \text{ mL/hr} \times 15 \text{ gtt/mL} = 1875 \text{ gtt/hr}$$

$$1875 \text{ gtt} \div 60 \text{ minutes} = 31 \text{ gtt/min}$$

12. Establish flow rate by counting drops in drip chamber for one minute by watch; then adjust roller clamp to increase or decrease rate of infusion (see Step 12 illustration).

- Formulas compute correct flow rate over a minute.
- Total volume $\times$ drop factor / infusion time in minutes
- Volume is multiplied by drop factor, and the product is divided by time (in minutes).
- When using microdrip, mL/hr always equals gtt/min.
- Determines whether fluids are administered too slowly or too quickly.



Step 10 Intravenous fluid bag with time tape.



Step 12 Counting intravenous drip rate.

13. Follow manufacturer's procedure for electronic infusion devices (EID).

- Infusion devices are recommended for minimizing risks associated with VAD (Lavery & Smith, 2007).

Continued

► SKILL 39-2 Regulating Intravenous Flow Rates—cont'd

video

Most pumps require you to begin by placing the intravenous infusion tubing within ridges of control box in direction of flow (i.e., portion of tubing nearest intravenous bag at top and portion of tubing nearest patient at bottom) (see Step 13B illustrations). Required drops per minute or volume per hour and volume to be infused are selected. Open rate control clamp and press start button.

- Infusion pumps move fluid by compressing and milking intravenous tubing, thus propelling fluid through tubing.
- Rate control clamp should be open completely while infusion controller or pump is in use.



Step 13 A, Place infusion tubing within ridges of pump. B, Press start button to begin infusion.

Critical Decision Point: Special infusion tubing is required for some pumps (check manufacturer's directions).

- A. Monitor infusion rates and intravenous site for complications according to agency policy.
 - B. Assess patency and integrity of system when alarm sounds.
14. Follow this procedure for volume control device:
 - A. Place volume control device (see Step 14A illustration) between intravenous bag and insertion spike of infusion set using sterile technique.
- Infusion controllers or pumps are not infallible and do not replace frequent, accurate nursing assessments. Infusion pumps may continue to infuse intravenous fluids after an infiltration has begun. All EIDs must have free-flow protector device.
 - Alarm indicates that electronic eye has not noted precise number of drops from drip chamber, the solution bag or bottle is empty, or flow is obstructed (e.g., kink in tubing, closed drip regulator, infiltrated or clotted needle, or air in the tubing).
 - Reduces risk of sudden increase in fluid volume.



Step 14A Volume control device.

► SKILL 39-2 Regulating Intravenous Flow Rates—cont'd



- B.** Place two hours of fluid allotment into chamber device.
- C.** Assess system at least hourly; add fluid to volume control device. Regulate flow rate.
15. Record name of solution, rate of infusion, drops/minute, and mL/hour in nurses' notes or flow sheet every four hours or according to patient's condition and to agency policy. Immediately record in nurses' notes or flow sheet any new intravenous fluid rates. Document use of any EID or controlling device and number on that device.
 16. Observe patient for response to therapy. Refer to Skill 39-1, Steps 42 and 44.
 17. Evaluate infusion site for signs of infiltration, inflammation, clot in catheter, or kink or knot in infusion tubing.
- Prevents intravenous line from running dry if nurse does not return in exactly 60 minutes. In addition, if an accidental increase in flow rate occurs, patient receives at most only a two-hour allotment of fluid.
 - Maintains patency of system.
 - Prompt and accurate documentation informs interdisciplinary collaboration.
 - Signs and symptoms of dehydration or overhydration warrant changing rate of fluid infused.
 - Prevents decrease in or cessation of flow rate.

Unexpected Outcomes

Sudden infusion of large volume of solution, with symptoms of dyspnea, crackles in lungs, and increased urine output, indicating fluid overload

Intravenous fluid bag runs empty, with subsequent loss of intravenous line patency

Related Interventions

- Slow infusion to KVO rate and notify physician immediately. New intravenous orders will be required. Patient may require diuretics.
- Intravenous therapy will be restarted.
- The intravenous infusion is slower than ordered.
- Check patient for positional change that might affect infusion rate, height of intravenous bag, kinking of tubing.
- An infiltration may be developing at intravenous site. Check condition of site.
- If volume infused is deficient, consult physician for new order to provide necessary fluid volume.

Reporting

- At change of shift or when leaving on break, report rate of infusion to nurse in charge or next nurse assigned to care for patient.

Home Care Considerations

- Ensure that patient is able and willing to operate the EID (if applicable) and administer intravenous therapy or that a reliable caregiver or nursing support personnel is at home to provide this intravenous therapy care.
- Teach patient and primary caregiver to time drops per minute using watch with second hand.
- Ensure proper EID function and that electrical outlets are functioning properly and grounded and infusion device has backup power, if required by type of infusate.
- Teach patient and caregiver alarms and how to troubleshoot them.
- Provide patient and caregiver with a phone number that can be accessed 24 hours a day.

board helps keep the joint extended (Figure 39-14). The arm board also provides some protection to the intravenous site and tubing. Most often it is preferred to have an IV catheter inserted in a new site rather than relying on a site that causes problems. However, before discontinuing the infusion hampered by an extremity position, you should start the infusion in another site to verify that the patient has other accessible veins.

Sudden increases can occur accidentally. For example, a restless patient may loosen the roller clamp with a sudden movement and increase the flow rate, or the flow rate may be accidentally increased if the patient ambulates. Some IV catheters are positional in the patient's vein. A sudden increase in the intravenous infusion rate causes a rapid increase in vascular volume, which can make the patient critically ill or even cause death. EID and volume control devices are designed to prevent sudden changes in infusion rate.



Figure 39-14 Intravenous arm board.

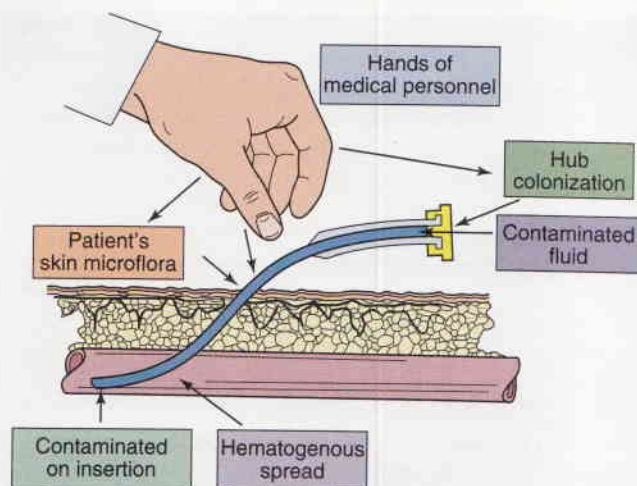


Figure 39-15 Potential sites for contamination of an intravenous device.

Maintaining the System. After the intravenous line is in place and the flow rate is regulated, you must maintain the system. Observe agency policy regarding the maintenance of intravenous lines. Line maintenance is achieved by (1) keeping the system sterile; (2) changing solutions, tubing, and site dressings; and (3) assisting the patient with self-care activities so as not to disrupt the system.

You play an important role in maintaining the integrity of an intravenous line to prevent infection from developing. Knowledge of potential sites for contamination informs your practice (Figure 39-15). This begins with thorough hand hygiene before and after handling any component of the intravenous system.

The integrity of the intravenous system must always be maintained. Never disconnect tubing because it becomes

tangled or because it might be more convenient in positioning or moving a patient or applying a gown. If a patient needs more room to manoeuvre, extension tubing can be added to an intravenous line. However, the use of extension tubing should be kept to a minimum as each connection of tubing provides an opportunity for contamination. Stopcocks for connecting more than one solution to a single intravenous site are sources of contamination and should be avoided (INS, 2006). Whenever an intravenous line is disconnected from a stopcock, the port should be plugged with a sterile cap. A port should never remain exposed to air because of the risk of contamination. A new administration set should be exchanged with the subsequent fluid change.

Intravenous tubing also contains injection ports through which adapters can be inserted for medication injections. Gillies et al. (2008) recommend that intravenous tubing may be used for up to 96 hours without increasing chance of infection if it does not contain lipids, blood, or blood products. Needleless injection ports reduce the risk of needle-stick injury and reduce contamination, thereby promoting patient safety when connecting, accessing, or removing intravenous equipment (Casey & Elliot, 2007a, 2007b). This risk is further minimized by using alcohol-chlorhexidine gluconate solution or povidone-iodine for cleansing the port both before and after use (Casey & Elliott, 2007b). Kaler and Chinn (2007) recommend using pressure and friction with a cleansing swab for 15 seconds for preparation of a needleless port. Patients receiving intravenous therapy over several days will require a change of solutions. It is important to organize tasks so that this can be done in plenty of time before the solution empties and the cannula becomes clotted. Many agencies have policies regarding the “hang time” of intravenous fluids. Rickard et al. (2009) found no need to routinely replace IV fluid containers and recommend further research to establish set time points for replacing IV fluid containers. Skill 39-3 reviews steps for changing intravenous solutions.

Text continued on p. 983

► SKILL 39-3 Maintenance of Intravenous System

Delegation Considerations

In many provinces, this skill is included within the scope of practice for licensed and registered practical nurses. The skill of changing intravenous solutions and tubing should not be delegated to unregulated care providers (UCPs). UCPs may be delegated the tasks of collecting supplies, assisting with comfort measures, and distracting the patient during the procedure.

Equipment

Intravenous Infusion

- Bottle or bag of intravenous solution as ordered by physician
- Time tape
- Infusion tubing and tubing label
- Filter (size appropriate to solution) and extension tubing (if necessary)

Intermittent Saline Lock

- Injection cap, loop, or short extension tubing (if necessary)

Normal Saline Flush

- Syringe filled with normal saline
- 2 sterile 2 × 2 (5 cm × 5 cm) gauze pads
- Tape
- Disposable gloves

Discontinuation of Intravenous Line

- Disposable gloves
- Alcohol swabs
- Sterile 2 × 2 (5 cm × 5 cm) gauze
- Tape

► SKILL 39-3 Maintenance of Intravenous System—cont'd**Procedure****STEPS****Changing Intravenous Solution**

1. Check physician's orders.
2. If order is written for keep-vein-open (KVO) or to keep open (TKO), contact physician for clarification of the rate of the infusion. Note date and time when solution was last changed.
3. Determine the compatibility of all intravenous fluids and additives by consulting appropriate literature or the pharmacy.
4. Determine patient's understanding of need for continued intravenous therapy.
5. Assess patency of current intravenous access site.
6. Have next solution prepared and accessible at least one hour before needed. Check that solution is correct and properly labelled. Check solution expiration date and for presence of precipitate and discolouration.
7. Prepare to change solution when less than 50 mL of fluid remains in bottle or bag or when a new type of solution is ordered.
8. Prepare patient and family by explaining the procedure, its purpose, and what is expected of patient.
9. Be sure drip chamber is at least half full.
10. Perform hand hygiene.
11. Prepare new solution for changing. If using plastic bag, remove protective cover from intravenous tubing port. If using glass bottle, remove metal cap and metal and rubber discs.
12. Move roller clamp to stop flow rate.
13. Remove old intravenous fluid container from intravenous pole.
14. Quickly remove spike from old solution bag or bottle and, without touching tip, insert spike into new bag or bottle.

RATIONALE

- Ensures that correct solution will be used. Intravenous therapy requires the seven rights of medication administration.
- Orders for KVO do not provide complete information and can result in fluid overload or deficit and electrolyte imbalance. A KVO order should contain a specific infusion rate (INS, 2006). Refer to agency policy. Intravenous tubing and solution should be changed at the same time.
- Incompatibilities may lead to precipitate formation and can cause physical, chemical, and therapeutic patient changes. Precipitation may occlude patency of catheter.
- Reveals need for patient instruction.
- If patency is occluded, a new intravenous access site may be needed. Notify physician.
- Adequate planning reduces risk of clot formation in vein caused by empty intravenous bag. Checking prevents medication error.
- Prevents air from entering tubing and vein from clotting from lack of flow.
- Decreases anxiety and promotes cooperation.
- Provides fluid to vein while bag is changed.
- Reduces transmission of microorganisms.
- Permits quick, smooth, and organized change from old to new solution.
- Prevents solution remaining in drip chamber from emptying while changing solutions.
- Brings work to nurse's eye level.
- Reduces risk of solution in drip chamber running dry and maintains sterility.

Critical Decision Point: If spike is contaminated, a new intravenous tubing set is required.

15. Hang new bag or bottle of solution on intravenous pole.
 16. Check for air in tubing. If bubbles form, they can be removed by closing the roller clamp, stretching the tubing downward, and tapping the tubing with the finger (the bubbles rise in the fluid to the drip chamber; see Step 16 illustration). For larger amounts of air, swab injection port below the air with alcohol and allow to dry. Connect a syringe to this port and aspirate the air into the syringe. Reduce air in tubing by priming slowly instead of allowing a wide-open flow.
- Gravity assists with delivery of fluid into drip chamber.
 - Reduces risk of air embolus. Use of an air-eliminating filter also reduces this risk.

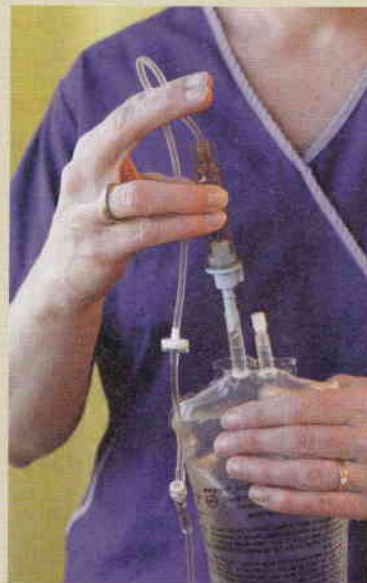
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► SKILL 39-3 Maintenance of Intravenous System—cont'd

17. Make sure drip chamber is one-third to one-half full. If the drip chamber is too full, pinch off tubing below the drip chamber, invert the container, squeeze the drip chamber (see Step 17 illustration), hang up the bag, and release the tubing.



Step 16 Tap tubing to cause air bubbles to rise up to drip chamber.



Step 17 Pinch tubing, invert chamber, and squeeze drip chamber to remove a portion of fluid. **Source:** Courtesy Darlaine Jantzen.

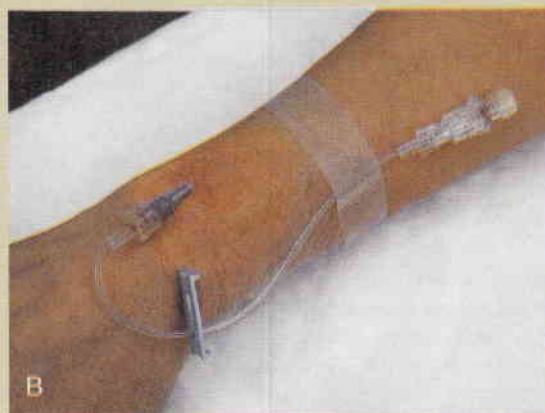
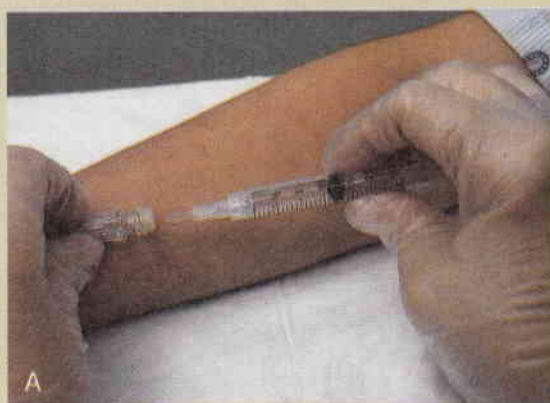
18. Regulate flow to prescribed rate.
19. Mark time on label tape and place on bag. Do not use felt-tipped pens or permanent markers on intravenous bags.
20. Observe patient for signs of overhydration or dehydration to determine response to intravenous fluid therapy.
21. Observe intravenous system for patency and development of complications (e.g., infiltration or phlebitis).

Changing Intravenous Tubing

22. Determine when new infusion set is needed:
- A. Agency policy will indicate frequency of routine change for intravenous administration sets and saline flush tubing.
 - B. Puncture of infusion tubing requires immediate change.
 - C. Contamination of tubing requires immediate change.
 - D. Occlusions in existing tubing can occur after infusion of packed red blood cells, whole blood, albumin, or other blood components.
23. Prepare patient and family by explaining the procedure, its purpose, and what is expected of patient.
24. Perform hand hygiene.
25. Open new infusion set, keeping protective coverings over infusion spike and distal adapter. Secure all junctions with Luer-Loks, clamping devices, or threaded devices.
26. Apply nonsterile, disposable gloves.
- Reduces risk of air entering tubing.
 - Maintains measures to restore fluid balance and deliver intravenous fluid as ordered.
 - Ink from markers may leach through polyvinyl chloride containers.
 - Provides ongoing evaluation of patient's fluid and electrolyte status.
 - Provides ongoing evaluation of intravenous system.
 - Note that usually the tubing and the bag, and even the site, are changed at the same time. (Refer to Steps 13–22, 33, and 34, to change bag and tubing.)
 - Recent evidence (Gillies et al., 2008) recommends up to 96 hours for tubing changes.
 - Punctured tubing results in fluid leakage and bacterial contamination.
 - Contamination of tubing allows entry of bacteria into patient's bloodstream.
 - Whole blood or blood component product can occlude or partially occlude tubing because viscous solutions adhere to walls of tubing and decrease the size of the lumen.
 - Decreases anxiety, promotes cooperation, and prevents sudden movement of extremity, which could dislodge intravenous needle or catheter.
 - Reduces transmission of microorganisms.
 - Provides nurse with ready access to new infusion set and maintains sterility of infusion set.
 - Reduces risk of exposure to HIV, hepatitis, and other bloodborne pathogens.

SKILL 39-3 Maintenance of Intravenous System—cont'd

27. If catheter hub is not visible, remove intravenous dressing while maintaining stability of catheter. If transparent dressing has to be removed, place small piece of sterile tape across hub temporarily to anchor catheter during disconnection. Do not remove tape securing catheter to skin with gauze dressing.
 28. For intravenous continuous infusion:
 - A. Move roller clamp on new intravenous tubing to closed position.
 - B. Slow rate of infusion by regulating drip rate on old tubing. Be sure rate is at KVO rate.
 - C. Compress and fill drip chamber of old tubing.
 - D. Remove intravenous container from pole, invert container, and remove old tubing from container. Carefully hold container while hanging or taping drip chamber on intravenous pole 1 m above intravenous site.
 - E. Place insertion spike of new tubing into old solution bag opening and hang solution bag on intravenous pole.
 - F. Compress and release drip chamber on new tubing; fill drip chamber one-third to one-half full.
 - G. Slowly open roller clamp, remove protective cap from needle adapter (if necessary), and flush new tubing with solution. Replace cap.
 - H. Turn roller clamp on old tubing to closed position.
 29. To connect to a saline lock:
 - A. If a loop or short extension tubing is needed because of an awkward intravenous site placement, use sterile technique to connect the new injection cap to the loop or tubing.
 - B. Swab injection cap with recommended solution for 15 seconds. Insert syringe with 1 to 3 mL saline and inject through the injection cap into the loop or short extension tubing (see Step 29B illustrations). Connect tubing to injection cap.
- Hub must be accessible to provide smooth transition when removing old and inserting new tubing.
 - Prevents spillage of solution after bag or bottle is spiked.
 - Prevents complete infusion of solution that remains in tubing, which can increase risk of occlusion of intravenous catheter or needle.
 - Provides surplus of fluid in drip chamber so enough fluid is available to maintain intravenous patency while changing tubing.
 - Fluid in drip chamber will run slowly to keep catheter patent.
 - Permits flow of fluid from solution into new infusion tubing.
 - Allows drip chamber to fill and promotes rapid, smooth flow of solution through new tubing.
 - Removes air from tubing and replaces it with fluid.
 - Prevents spillage of fluid as tubing is removed from needle hub.
 - Removes air to prevent introduction into the vein.



Step 29B A, Inject saline into injection cap. B, Connect to saline lock extension tube.

30. To change (continuous or extension set) tubing at the hub, stabilize hub of catheter and apply pressure over vein just above catheter tip at least 3 cm above insertion site. Gently disconnect old tubing from catheter hub. Maintain stability of hub and quickly insert adapter of new tubing or saline lock into hub.
 31. Open roller clamp on new tubing. Allow solution to run rapidly for 30 to 60 seconds.
 32. Regulate intravenous drip according to physician's orders and monitor rate hourly.
- It is important to maintain asepsis at the catheter hub; therefore, place an alcohol swab or sterile gauze beneath the hub.
 - Prevents accidental displacement of catheter or needle.
 - Prevents clot formation in catheter or needle and backflow of blood.
 - Permits intravenous solution to enter catheter to prevent catheter occlusion.
 - Maintains infusion flow at prescribed rate.

Continued

► SKILL 39-3 Maintenance of Intravenous System—cont'd

33. Apply new dressing, if needed.
34. Discard old tubing in proper container.
35. Remove and dispose of gloves. Perform hand hygiene.
36. Evaluate flow rate and observe connection site for leakage.

Discontinuing Peripheral Intravenous Access

37. Check physician's order for discontinuation of intravenous therapy.
 38. Explain procedure to patient. Explain that affected extremity must be held still and how long procedure will take.
 39. Perform hand hygiene and apply disposable gloves.
 40. Turn intravenous tubing roller clamp to closed position. Remove tape securing tubing.
 41. Remove intravenous site dressing and tape while stabilizing catheter.
 42. With dry gauze or alcohol swab held over site, apply light pressure and withdraw the catheter, using a slow steady movement, keeping the hub parallel to the skin (see Step 42 illustration).
- Reduces risk of bacterial infection from skin.
 - Reduces accidental transmission of microorganisms.
 - Reduces transmission of microorganisms.
 - Maintains prescribed rate of flow of intravenous fluid and determines if fit is secure.
 - Order is required for discontinuation of fluids or medication.
 - Minimizes patient's anxiety and discomfort.
 - Reduces transmission of microorganisms.
 - Movement of catheter will cause discomfort.
 - Changing the angle of the catheter inside the vein could cause additional vein irritation, increasing the risk of postinfusion phlebitis.



Step 42 Remove catheter slowly, keeping it parallel to the vein.

Critical Decision Point: If patient has received anticoagulants (e.g., low-dose aspirin, warfarin sodium [Coumadin], heparin) or has a low platelet count, apply steady pressure for 5 to 10 minutes and assess bleeding.

43. Apply pressure to the site for two to three minutes, or until no further bleeding is noted, using the dry, sterile gauze pad. Secure with tape.
 44. Inspect the catheter for intactness, noting tip integrity and length.
 45. Discard used supplies.
 46. Remove and discard gloves and perform hand hygiene.
 47. Instruct patient to report any redness, pain, drainage, or swelling that may occur after catheter removal.
- Dry pad causes less irritation to the puncture site. Subcutaneous hematoma is a common complication. When needle is removed, vein wall contracts to stop bleeding.
 - Tips of catheter can break off, causing an embolus, an emergency situation. Notify physician if tip is broken.
 - Postinfusion phlebitis may occur within 48 to 96 hours after catheter removal.

Unexpected Outcomes

Incorrect flow rate; patient receives too little or too much fluid

Decreased or absent flow of intravenous fluid

Related Interventions

- Readjust infusion rate to ordered rate; evaluate patient for adverse effects; notify physician.
- Assess intravenous infusion system for patency.
- Recalibrate drip rate on new tubing.
- Assess intravenous site for infiltration.

Recording and Reporting

- Record changing of tubing and solution on patient's record. A special parenteral therapy flow sheet may be used.
- Place a piece of tape or preprinted label with the date and time of tubing change and attach to tubing below the level of drip chamber.

Home Care Considerations

- Emphasize to patient and family the importance of changing solutions when intravenous tubing still contains fluid.

The dressings over intravenous sites are applied to reduce the entrance of bacteria into the insertion site. The two forms of dressings are transparent and gauze. Transparent dressings reliably secure the intravenous device, allow continuous visual inspection of the intravenous site, become less easily soiled or moistened, and require less frequent changes than standard gauze. Intravenous dressings should be routinely changed as per agency policy (Skill 39-4).

To prevent the accidental disruption of an intravenous system, you may need to assist the patient with hygiene, comfort measures, meals, and ambulation. Using a gown specifically made with snaps along the top sleeve seam helps facilitate changing the gown without disturbing the venipuncture site. Regular gowns are changed as follows:

1. Remove the sleeve of the gown from the arm without the intravenous line, maintaining the patient's privacy.
2. Remove the sleeve of the gown from the arm with the intravenous line.
3. Remove the intravenous solution container from its stand and pass it and the tubing through the sleeve. (If this involves removing the tubing from an intravenous electronic infusion device, use the roller clamp to slow the infusion to prevent the accidental infusion of a large volume of solution or medication.)
4. Place the intravenous solution container and tubing through the sleeve of the clean gown and hang it on its stand. (If the intravenous line is connected to an electronic infusion device, open the roller clamp. Turn on the pump.)

► SKILL 39-4 Changing a Peripheral Intravenous Dressing

Delegation Considerations

In many provinces, the skill of changing a peripheral intravenous dressing is included within the scope of practice for licensed and registered practical nurses. This skill should not be delegated to unregulated care providers (UCPs). UCPs may be delegated the tasks of collecting supplies, assisting with comfort measures, and distracting the patient during the procedure.

Equipment

- Antiseptic swab stick (chlorhexidine, povidone-iodine, or 70% alcohol, as recommended by the agency)
- Adhesive remover (if needed)
- Strips of nonallergenic sterile tape for use underneath the dressing
- Disposable gloves
- *For gauze dressing:*
 - Sterile 2 × 2 (5 cm × 5 cm) gauze pad OR
 - Sterile 4 × 4 (10 cm × 10 cm) gauze pad
- *For transparent dressing:*
 - Sterile transparent dressing

Procedure

STEPS

1. Determine when dressing was last changed. Many institutions require that the nurse records the date and time on the dressing when the device is first placed.
2. Perform hand hygiene. Observe present dressing for moisture and intactness.
3. Observe intravenous system for proper functioning or complications: kinks in infusion tubing or intravenous catheter. Palpate the catheter site through the intact dressing for inflammation or subjective complaints of pain or burning sensation.
4. Inspect exposed catheter site for swelling or blanching and other signs of infiltration.
5. Assess patient's understanding of need for continued intravenous infusion.
6. Explain procedure and purpose to patient and family. Explain that affected extremity must be held still and how long procedure will take.
7. Apply disposable gloves.
8. Remove tape, gauze, or transparent dressing from old dressing one layer at a time, leaving tape (if present) that secures intravenous catheter in place. Be cautious if catheter tubing becomes tangled or attached to dressing. When removing transparent dressing, hold catheter hub and tubing with nondominant hand.
9. Observe insertion site for signs and symptoms of infection (redness, swelling, and exudate). If present, remove catheter and insert a new intravenous line in another site.

RATIONALE

- Provides information regarding length of time present dressing has been in place. The Centers for Disease Control recommends that, whenever possible, peripheral intravenous dressings should be scheduled when intravenous system is changed.
- Moisture is a medium for bacterial growth and renders dressing contaminated.
- Unexplained decrease in flow rate requires investigation of placement and patency of the intravenous catheter. Pain can be associated with both phlebitis and infiltration.
- Indicates fluid infusing into surrounding tissues. Will require removal of intravenous catheter.
- Determines need for patient instruction.
- Decreases anxiety, promotes cooperation, and gives patient time frame around which personal activities can be planned.
- Reduces transmission of microorganisms.
- Prevents accidental displacement of catheter or needle.
- Presence of infection or complication indicates need to remove VAD at current site.

Continued

► SKILL 39-4 Changing a Peripheral Intravenous Dressing

10. If infiltration, phlebitis, or clot occurs or if ordered by physician, stop infusion and discontinue intravenous therapy. Restart new intravenous line if continued therapy is necessary. Place moist, warm compress over area of phlebitis.
 11. If intravenous fluid is infusing properly, gently remove any tape securing catheter. Stabilize needle or catheter with one hand. Use adhesive remover to cleanse skin and remove adhesive residue, if needed.
 12. Stabilize catheter at all times with one finger over catheter until tape or dressing is replaced.
 13. Using circular motion, cleanse peripheral intravenous insertion site with antiseptic swab starting at insertion site and working outward, creating concentric circles (see Step 13 illustration). Allow swab solution to air-dry completely.
- Exposes venipuncture site. Stabilization prevents accidental displacement of catheter or needle. Adhesive residue decreases ability of new dressing to adhere tightly to skin.
 - Prevents decannulation from vein.
 - Circular motion prevents cross-contamination from skin bacteria near venipuncture site. Antiseptics may include chlorhexidine, povidone-iodine, and alcohol. RNAO (2005) recommends 2% chlorhexidine-based solution. If antiseptic agents are used in combination, allow each to dry separately.



Step 13 Cleanse peripheral insertion site.

Critical Decision Point: Do not tape over connection of access tubing or port to intravenous catheter.

14. Apply new transparent or gauze dressing (see Skill 39-1, Step 34A or 34B).
 15. Remove and discard gloves.
 16. Anchor intravenous tubing with additional pieces of tape. When using transparent polyurethane dressing, minimize the tape placed over dressing.
 17. Place insertion date, date and time of dressing change, size and gauge of catheter, and your initials directly on dressing. Apply arm board, commercial housing device, or both if site is affected by joint motion.
 18. Discard used equipment and perform hand hygiene.
 19. Observe functioning and patency of intravenous system in response to changing dressing.
 20. Monitor patient's body temperature.
- Ensures protection of intravenous site and reduces chance of infection.
 - Prevents accidental displacement of intravenous needle or catheter or separation of intravenous tubing from needle adapter.
 - Documents dressing change.
 - Reduces transmission of microorganisms.
 - Validates that intravenous line is patent and functioning correctly.
 - Elevated temperature indicates an infection that may be associated with bacterial contamination of the venipuncture site.

Unexpected Outcomes

Infiltration of intravenous catheter, as evidenced by decreased flow rate or edema, pallor, or decreased temperature around insertion site

Accidental removal of intravenous catheter or needle
Elevated body temperature

Red, edematous, or painful insertion site or presence of exudates, indicating infection at venipuncture site

Related Interventions

- Stop infusion and discontinue intravenous therapy. Restart new intravenous line in other extremity if continued therapy is necessary.
- Elevate affected extremity.
- Restart intravenous infusion if continued therapy is needed.
- Notify physician. Intravenous line may be removed and restarted. Patient will be evaluated for source of infection.
- Discontinue intravenous infusion. Antibiotic therapy may begin.
- Apply warm, moist compress to area of inflammation.

Recording and Reporting

- Record appearance of intravenous site, type of dressing, and status of intravenous fluid infusion.
- A special parenteral fluid flow sheet may be used for recording.



Figure 39-16 IV House protective device. **Source:** Courtesy IV House, St Louis, MO.

5. Place the arm with the intravenous line through the gown sleeve.
6. Place the arm without the intravenous line through the gown sleeve. (Breaking the integrity of an intravenous line to change a gown leads to contamination.)

Protective devices designed to prevent accidental dislodgement of an intravenous catheter (Figure 39-16) are now available. The device fits comfortably around a patient's hand or arm and provides a plastic shield to cover the intravenous device. Protective devices extend the time a catheter remains in the vein and minimize repeated venipuncture (Rosenthal, 2005).

The patient with an arm or a hand infusion is able to walk, unless contraindicated. A portable intravenous pole (a standard intravenous pole with wheels) is needed. Help the patient get out of bed and place the pole next to the involved arm. The patient is instructed to hold on to the pole and push it while walking. Assess the equipment to make sure that the intravenous bag is at the proper height, that the tubing is not tense, that the flow rate is correct, and that the tubing does not get contaminated. Instruct the patient to report any blood in the tubing, a stoppage in the flow, or increased discomfort. Intravenous medications, especially antibiotics and potassium, can cause discomfort and burning sensations at the intravenous site. Although discomfort may be relieved by repositioning the extremity, the source of discomfort must always be carefully evaluated and may necessitate starting a new intravenous line in a larger vein.

Complications of Intravenous Therapy. An **infiltration** occurs when intravenous fluids enter the surrounding space around the venipuncture site (see Table 39-8). This is manifested as swelling (from increased tissue fluid) and pallor and coolness (caused by decreased circulation) around the venipuncture site. Fluid may be flowing through the intravenous line at a decreased rate or may have stopped flowing. Pain may also be present and usually results from edema. This pain increases proportionately as the infiltration continues.

When infiltration occurs, the infusion must be discontinued, and if intravenous therapy is still necessary, a new catheter is inserted into a vein in another extremity. To reduce discomfort

and edema, raise the extremity, which promotes venous drainage. Wrapping the extremity in a warm, moist towel for 20 minutes while keeping it elevated on a pillow also promotes venous return, increases circulation, and reduces pain and edema. This can be repeated three to four times per day until resolved. Infiltration of medications that cause extravasation require specific care, outlined by institutional policy.

Phlebitis is inflammation of the vein. Selected risk factors for phlebitis include the type of catheter material, chemical irritation of additives and drugs given intravenously (e.g., antibiotics), the rate of the medication administration, the skill of the individual inserting the catheter, and the anatomical position of the catheter. Signs and symptoms may include pain, edema, erythema, increased skin temperature over the vein, and, in some instances, redness travelling along the path of the vein (INS, 2006). Dehydration may also be a contributing factor because of the increase in blood viscosity.

When phlebitis develops, the intravenous line must be discontinued and a new line inserted in another vein. Warm, moist heat on the site of phlebitis can offer some relief to the patient. Phlebitis can be dangerous because blood clots (thrombophlebitis) can occur and in some cases may result in emboli. This may result in permanent damage to veins and in prolonging the patient's hospitalization.

Bleeding can occur around the venipuncture site during the infusion or through the catheter needle or tubing if these become inadvertently disconnected. Bleeding is common in patients who have received heparin or who have a bleeding disorder (e.g., leukemia or thrombocytopenia). If bleeding occurs around the venipuncture site and the catheter is within the vein, a pressure dressing may be applied over the site to control the bleeding. Bleeding from a vein is usually a slow, continuous seepage and is not serious.

Discontinuing Intravenous Infusions. Discontinuing an infusion is necessary after the prescribed amount of fluid has been infused, when an infiltration occurs, if phlebitis is present, or if the infusion catheter or needle develops a clot at its tip. Refer to Skill 39-3, Steps 38 to 48.

Blood Replacement. Blood replacement or transfusion is the intravenous administration of whole blood or a component such as plasma, packed red blood cells (RBCs), or platelets. The objectives for blood transfusions include the following: (1) to increase circulating blood volume after surgery, trauma, or hemorrhage; (2) to increase the number of RBCs and to maintain hemoglobin levels in patients with severe anemia; and (3) to provide selected cellular components as replacement therapy (e.g., clotting factors, platelets, albumin).

Blood Groups and Types. The most important grouping for transfusion purposes is the ABO system, which includes A, B, O, and AB blood types. The determination of blood groups is based on the presence or absence of A and B RBC antigens. Individuals with A antigens, B antigens, or no antigens belong to groups A, B, and O, respectively. The person with A and B antigens has AB blood. Individuals with type A blood naturally produce anti-B antibodies in their plasma. Similarly, individuals with type B blood naturally produce anti-A antibodies. An individual with type O blood has neither type A nor type B antigen and thus is considered a universal blood donor. Individuals with type AB blood produce neither antibody, which is why they can be universal recipients and receive any type of blood (Table 39-10). If blood that is mismatched with the patient's blood is transfused, a **transfusion reaction** occurs. The transfusion reaction is an antigen-antibody reaction and

► TABLE 39-10 Blood Groups and Compatibility

Blood Type	Antigens of Red Blood Cell	Able to Donate	Serum (Plasma) Antibodies	Able to Receive From
A	A	A, AB	Anti-B	A, O
B	B	B, AB	Anti-A	B, O
AB	A and B	AB	None	A, B, AB, O
O	None	A, B, AB, O	Anti-A and anti-B	O

can range from a mild response (e.g., faintness, dizziness) to severe anaphylactic shock, which can be life-threatening (Davis et al., 2005–2006).

Another consideration when matching for blood transfusions is the Rh factor, which is an antigenic substance in the erythrocytes. A person with the factor is Rh positive, and a person without it is Rh negative. Blood must be matched for Rh factor as well as ABO grouping. Rh negative people must receive only Rh negative blood, whereas Rh positive people can receive either Rh negative or Rh positive blood.

Autologous Transfusion. Autologous transfusion or auto-transfusion is the collection of a patient's own blood. The blood for an autologous transfusion can be obtained by preoperative donation up to five weeks before the planned surgery (e.g., heart, orthopedic, plastic, or gynecological). Patients can donate one to five units of their own blood, depending on the type of surgery and the ability of the patient to maintain an acceptable hematocrit. The blood will be tested for HIV and hepatitis B virus. Another way to collect blood for an autologous transfusion is during perioperative blood salvage (e.g., during vascular and orthopedic surgery, organ transplant surgery, and traumatic injuries). The blood that has been salvaged is then reinfused during the surgery. Blood can also be salvaged postoperatively from mediastinal and chest tube drainage and after joint and spinal surgery. Autologous transfusions decrease the risk of complications such as mismatched blood and exposure to bloodborne infectious agents.

Blood Transfusions. When transfusing blood or blood components, assessment is required before, during, and after the transfusion and for regulation of the transfusion because of the risk of allergic reactions. If the patient has an intravenous line in place, assess the venipuncture site for signs of infection or infiltration and patency. Determine the appropriate gauge of the intravenous catheter. A large catheter, such as 18 to 20 gauge, is recommended because blood is thicker and stickier than intravenous fluids. Blood administration tubing has an in-line filter (Figure 39-17). When priming blood administration tubing, 0.9% normal saline should be used to prevent hemolysis, or breakdown of RBCs.

Pretransfusion assessment also includes obtaining information from the patient. Ask whether the patient knows the reason for the blood transfusion and whether the patient has ever had a previous transfusion or transfusion reaction. A patient who has had a transfusion reaction is usually at no greater risk for a reaction with a subsequent transfusion. However, the patient may be anxious about the transfusion. Before giving a transfusion, explain the procedure and instruct the patient to report any side effects (e.g., chills, dizziness, or fever) once the transfusion begins. Check to be sure the patient has signed an informed consent form. Patients with certain cultural backgrounds may abstain from blood transfusions (Box 39-12).

Because of the danger of transfusion reactions, it is very important to use specific precautions in administering blood



Figure 39-17 Blood administration tubing.

* BOX 39-12 CULTURAL ASPECTS OF CARE

Preinfusion Assessments

When a patient's natural skin contains more melanin, it becomes more difficult to identify colour changes. Intravenous complications such as phlebitis and infiltration may not be easily detected. Patients with some cultural backgrounds have fear related to the donor process for blood. Patients with certain religious or personal beliefs may abstain from receiving blood transfusions or medications.



Implications for Practice

- Establish communication. Understand the values of family elders and know whom to speak with about intravenous procedures.
- Assess patients individually to determine their acceptance of or abstinence from therapeutic regimens.
- Appreciate patients' choice related to their therapy.
- Although some patients will abstain from receiving whole blood or packed RBCs, they will accept other blood products or alternatives.

Adapted from Rudnicke, C. (2003). Transfusion alternatives. *Journal of Infusion Nursing*, 26(3), 29.

or blood products. Obtain the patient's baseline vital signs before the transfusion begins. This allows you to determine when changes in vital signs occur, which can indicate that a transfusion reaction is developing. A thorough check of the blood product, the patient, and the compatibility of the blood

and the patient ensures that the patient receives the correct type of blood or blood product. Although you are not involved in the blood labelling process, you are responsible for determining that the blood delivered to the patient corresponds to the blood type listed in the patient's medical record. Two registered nurses or one registered nurse and a licensed practical nurse (see agency policy) must together check the label on the blood product against the patient's identification number, blood group, and complete name. If even a minor discrepancy exists, the blood should not be given and the blood bank should be notified immediately.

Initiation of a transfusion begins slowly to allow for the early detection of a transfusion reaction. Maintain the infusion rate, monitor for side effects, assess vital signs, and promptly record all findings. Stay with the patient during the first 15 minutes, the time when a reaction is most likely to occur. Continue to monitor the patient and obtain vital signs periodically during the transfusion as directed by agency policy.

The rate of transfusion is usually specified in the health care provider's orders. Ideally, a unit of whole blood or packed RBCs is transfused in two hours. This time can be lengthened to four hours if the patient is at risk for FVE. Beyond four hours, bacterial contamination of the blood is a risk (Davis et al., 2005–2006). When patients have a severe blood loss, such as with hemorrhage, they may receive rapid transfusions through a CVC. A blood-warming device is often necessary because the tip of the CVC lies in the superior vena cava, above the right atrium. Rapid administration of cold blood can result in cardiac dysrhythmia (Burgess, 2006).

The administration tubing used for RBCs should be discarded at four hours or after two units and should be discarded immediately following fractionated products, such as IVIG, clotting factors, and albumin (RNAO, 2005).

Transfusion Reactions. A transfusion reaction is a systemic response by the body to incompatible blood. Causes include RBC incompatibility or allergic sensitivity to the components of the transfused blood or to the potassium or citrate preservative in the blood. Several types of acute reactions can result from blood transfusions (Table 39-11). If a transfusion reaction is anticipated or suspected, monitor vital signs more frequently (see Table 39-11).

A second category of transfusion reactions includes diseases transmitted by infected blood donors who are asymptomatic. Diseases transmitted through transfusions are malaria, hepatitis, and AIDS. Because all units of blood collected must undergo serological testing and screening for HIV and hepatitis B virus, the risk of acquiring bloodborne infections from blood transfusions is reduced.

Circulatory overload is a risk when a patient receives large volumes of whole blood or packed RBC transfusions for massive hemorrhagic shock or when a patient with normal blood volume receives blood. Patients particularly at risk for circulatory overload are older adults and those with cardiopulmonary diseases.

Blood transfusion reactions are life-threatening, but prompt nursing intervention can maintain the patient's physiological stability.

- Do not turn off the blood and simply turn on the 0.9% normal saline that is connected to the Y-tubing infusion set. This would cause blood remaining in the Y-tubing to infuse into the patient. Even a small amount of mismatched blood can cause a major reaction.
- Notify the physician immediately.
- Remain with the patient, observing signs and symptoms and monitoring vital signs as often as every five minutes.
- Prepare to administer emergency drugs such as antihistamines, vasopressors, fluids, and steroids as per physician order or protocol.
- Prepare to perform cardiopulmonary resuscitation.
- Obtain a urine specimen and send it to the laboratory to determine the presence of hemoglobin as a result of RBC hemolysis.
- Save the blood container, tubing, attached labels, and transfusion record, and return them to the laboratory.

Restorative Care

After experiencing acute alterations in fluid, electrolyte, or acid-base balance, patients often require ongoing maintenance to prevent a recurrence of health alterations. Older adults and the chronically ill require special considerations to prevent complications from developing.

Home Intravenous Therapy. Intravenous therapy is often continued in the home setting for patients who are discharged from the hospital and have not completed their prescribed treatment or who require long-term therapy. Ideally, a family member will be available at home if the patient suddenly cannot manage the intravenous system or if a problem develops. A home care nurse will work closely with the patient and family to ensure that a sterile intravenous system is maintained and that complications are avoided or recognized promptly. Box 39-13 summarizes patient education guidelines for home intravenous therapy.

Nutritional Support. Most patients who have had electrolyte disorders or metabolic acid-base disturbances require ongoing nutritional support. Depending on the type of disorder, fluid or food intake may be encouraged or restricted (see Chapter 42). If patients are still responsible for meal preparation, they should learn to understand the nutritional content of foods and to read the labels of commercially prepared foods.

Medication Safety. Numerous medications and over-the-counter drugs contain components or create potential side effects that can alter fluid and electrolyte balances. Patients with chronic disease who are receiving multiple medications and those with renal or liver disorders are at significant risk for alterations in fluid and electrolyte status (Box 39-14). Once patients return to a restorative care setting, whether in their home or in a residential care home, drug safety becomes very important. Patient and family education is essential to providing information regarding potential drug interactions and what side effects they cause. Review all medications with patients and encourage them to consult with their local pharmacist, especially if they try a new over-the-counter medication.

❖Evaluation

Patient Care

The evaluation of a patient's clinical status is especially important if an acute fluid and electrolyte or acid-base disturbance exists. The patient's condition can change very quickly, and you must be able to recognize the signs and symptoms of

safety alert

If a blood reaction is suspected, stop the transfusion immediately.

- Keep the intravenous line open by “piggybacking” 0.9% normal saline directly into the intravenous line and running the saline.

► TABLE 39-11 Acute Transfusion Reactions

Reaction	Cause	Clinical Manifestations	Management	Prevention
Acute hemolytic	Infusion of ABO-incompatible whole blood, RBCs, or components containing 10 mL or more of RBCs Antibodies in the recipient's plasma attach to antigens on transfused RBCs, causing RBC destruction	Chills, fever, low back pain, flushing, tachycardia, tachypnea, hypotension, vascular collapse, hemoglobinuria, hemoglobinemia, bleeding, acute renal failure, shock, cardiac arrest, death	Stop transfusion. Treat shock, if present. Draw blood samples for serological testing slowly to avoid hemolysis from the procedure. Send urine specimen to the laboratory. Maintain BP with intravenous colloid solutions. Give diuretics as prescribed to maintain urine flow. Insert in-dwelling catheter or measure voided amounts to monitor hourly urine output. Dialysis may be required if renal failure occurs. Do not transfuse additional RBC-containing components until transfusion service has provided newly cross-matched units.	Meticulously verify and document patient identification from sample collection to component infusion.
Febrile, nonhemolytic (most common)	Sensitization to donor white blood cells, platelets, or plasma proteins	Sudden chills and fever (rise in temperature of greater than 1°C), headache, flushing, anxiety, muscle pain	Give antipyretics as prescribed—avoid aspirin in patients with thrombocytopenia. <i>Urgent:</i> Do not restart transfusion.	Consider leukocyte-poor blood products (filtered, washed, or frozen).
Mild allergic	Sensitivity to foreign plasma proteins	Flushing, itching, urticaria (hives)	Give antihistamine as directed. If symptoms are mild and transient, transfusion may be restarted slowly. <i>Urgent:</i> Do not restart transfusion if fever or pulmonary symptoms develop.	Treat prophylactically with antihistamines.
Anaphylactic	Infusion of IgA proteins to IgA-deficient recipient who has developed IgA antibody	Anxiety, urticaria, wheezing, progressing to cyanosis, shock, possible cardiac arrest	Initiate CPR, if indicated. Have epinephrine ready for injection (0.4 mL of a 1:1000 solution subcutaneously or 0.1 mL of 1:1000 solution diluted to 10 mL with saline for intravenous use). <i>Urgent:</i> Do not restart transfusion.	Transfuse extensively washed RBC products, from which all plasma has been removed. Alternatively, use blood from IgA-deficient donor.
Circulatory overload	Fluid administered faster than the circulation can accommodate	Cough, dyspnea, pulmonary congestion (rales), headache, hypertension, tachycardia, distended neck veins	Place patient upright with feet in dependent position. Administer prescribed diuretics, oxygen, morphine. Phlebotomy may be indicated.	Adjust transfusion volume and flow rate on the basis of patient size and clinical status. Have transfusion service divide unit into smaller aliquots for better spacing of fluid input.
Sepsis	Transfusion of contaminated blood components	Rapid onset of chills, high fever, vomiting, diarrhea, and marked hypotension and shock	Obtain culture of patient's blood and send bag with remaining blood to transfusion service for further study. Treat septicemia as directed—antibiotics, intravenous fluids, vasopressors, steroids.	Collect, process, store, and transfuse blood products according to blood banking standards and infuse within 4 hours of starting time.

ABO, Blood group consisting of groups A, AB, B, and O; BP, blood pressure; CPR, cardiopulmonary resuscitation; IgA, immunoglobulin A; RBCs, red blood cells. Data from Brecher, M. (Ed.). (2005). *AABB technical manual* (15th ed.). Bethesda, MD: American Association of Blood Banks; and Goodnough, L. T. (2005). Risks of blood transfusions. *Anesthesiology Clinics of North America*, 23, 241.

* BOX 39-13 PATIENT TEACHING

Home Intravenous Therapy

Objectives

- The patient, the primary caregiver, or both will demonstrate understanding and competence with intravenous therapy for safe delivery of medication in the home setting.



Teaching Strategies

- Explain to the patient and the primary caregiver the importance of intravenous therapy in maintaining hydration and access for the delivery of medications.
- Ensure that the patient and primary caregiver understand the risks involved when the intravenous system is not kept sterile.
- Be sure that the patient, the primary caregiver, or both can manipulate the required equipment.
- Instruct the patient and the primary caregiver in aseptic technique and hand hygiene when handling all intravenous equipment.
- Instruct the patient and the primary caregiver in how to change intravenous solutions, tubing, and dressings when they become soiled or dislodged. (Note: The home care nurse may be able to visit frequently enough to perform scheduled tubing and dressing changes.)
- Instruct the patient and the primary caregiver in procedures for safe disposal, in appropriate containers, of all sharps and intravenous materials exposed to blood.
- Instruct the patient and the primary caregiver about signs and symptoms of infiltration, phlebitis, and infection and about reporting symptoms immediately.
- Instruct the patient, the primary caregiver, or both to report slowing or cessation of the infusion or to report the presence of blood in the tubing.
- Teach the patient, with the primary caregiver's assistance, how to ambulate, perform hygiene, and participate in other activities of daily living without dislodging or disconnecting cannula and tubing.

Evaluation

- Ask the patient and the primary caregiver why it is necessary to maintain hydration and intravenous access for the delivery of medications.
- Ask the patient and the primary caregiver what to do if intravenous fluid stops.
- Ask the patient and the primary caregiver to describe signs and symptoms of complications and the actions they should take.
- Observe the patient, the primary caregiver, or both changing the intravenous container, tubing, and dressing.
- Observe the patient ambulating and participating in activities of daily living to see how he or she protects and manipulates the intravenous cannula and apparatus.

impending problems by being aware of health alterations, the effects of medications and fluids, and the patient's presenting clinical status (Figure 39-18).

You determine whether changes have occurred from the last patient assessment, and you assess such changes. For example, the physical signs and symptoms of the assessed condition begin to disappear or lessen in intensity.

For patients with less acute alterations, evaluation likely occurs over a longer period of time. In this situation, your evaluation may be focused more on behavioural changes (e.g.,

* BOX 39-14 RESEARCH HIGHLIGHT

Managing Chronic Kidney Disease

Research Focus

Prevention of complications associated with chronic kidney disease requires attention to many biochemical parameters. In nurse-run clinics, nurses, with the guidance of physicians, are able to successfully manage these parameters through patient-centred care, health promotion, teaching, dealing with problems, time, protocols, consultations or referrals, logistics, paperwork or documentation, and nurse-physician collaboration.



Research Abstract

The purpose of the study conducted by Molzahn et al. (2008) was to describe the nature of the care provided to people with chronic kidney disease in a larger study of nurse-run, physician-monitored clinics and to describe how patients, nurses, and nephrologists described their experience with the clinics. Seven nurses, five physicians, and 22 patients participated in interviews, which were tape-recorded and transcribed. In addition to interviews, data collection involved review of 40 randomly selected charts. Themes identified related to the characteristics of the nurse, patient-centred care, health promotion, teaching, dealing with problems, time, protocols, consultations or referrals, logistics, paperwork or documentation, and nurse-physician collaboration. Challenges and outcomes were also described as part of the experience with the clinic. Patients were actively engaged in self-management and reported high levels of satisfaction with care, as well as improvements in selected outcomes. Overall, the perceptions about this model of care were positive, and the approach warrants further exploration.

Evidence-Informed Practice and Primary Health Care

- Regular assessment and management by nurses can be used to prevent cardiovascular disease and other complications of chronic kidney disease.
- Patient-centred care, teaching, and health promotion are important processes in caring for the patient with chronic kidney disease.
- Many people with chronic kidney disease are able and willing to self-manage their illness.

References: Molzahn, A. E., Pelletier Hibbert, M., Gaudet, D., Starzomski, R., Barrett, B., & Morgan, J. (2008). Managing chronic kidney disease in a nurse-run, physician-monitored clinic: The CanPREVENT experience. *Canadian Journal of Nursing Research*, 40, 96–112.

the patient's ability to follow dietary restrictions and medication schedules). The family's ability to anticipate alterations and prevent problems from recurring is also an important element of evaluation.

The patient's level of progress determines whether you need to continue or revise the care plan. If goals are not met, you may need to consult with a physician and discuss additional methods, such as increasing the frequency of an intervention (e.g., provide more fluids to a dehydrated patient), introducing a new therapy (e.g., initiate insertion of an intravenous line), or discontinuing a particular therapy. Once outcomes have been met, you can resolve the nursing diagnosis and focus on other priorities.

Patient Expectations

You routinely review with the patient his or her success in meeting expectations of care. "Tell me if I have helped you feel more comfortable" is a request you might make if the patient's

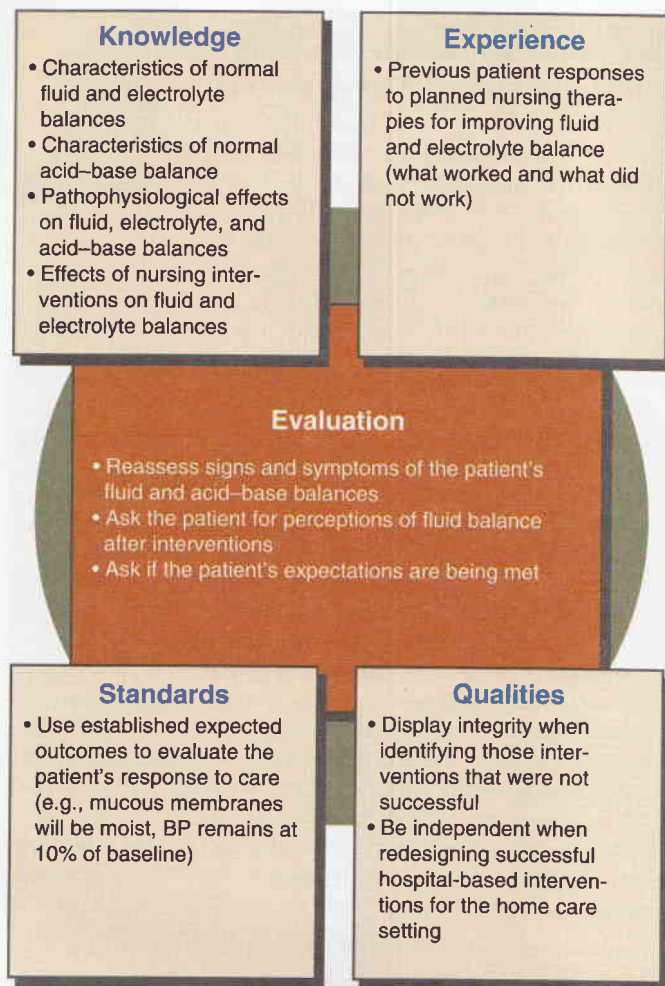


Figure 39-18 Critical thinking model for evaluation of fluid, electrolyte, and acid-base balances. BP, Blood pressure.

expectations revolve around comfort and symptom management. If the patient's concerns involve having a better understanding of a chronic problem, your evaluation might focus on the patient's satisfaction with educational offerings. Often the patient's level of satisfaction with care also depends on your success in involving family and friends. If the patient has concerns about returning home or to a different care setting, it will be important to evaluate if the patient feels prepared for the transition from acute care.

❖ KEY CONCEPTS

- Body fluids are distributed in ECF and ICF compartments.
- Body fluids are composed of electrolytes, minerals, cells, and water.
- Body fluids are regulated through fluid intake, fluid output, and hormonal regulation.
- Volume disturbances include isotonic and osmolar deficits and excesses.
- Electrolytes are regulated by dietary intake and hormonal controls.
- Acid-base imbalances are buffered by chemical, biological, and physiological buffering, especially the lungs and kidneys.
- Chronic and serious illnesses increase the risk of fluid, electrolyte, and acid-base imbalances.

- Patients who are very young or very old are at greater risk for fluid, electrolyte, and acid-base imbalances.
- Assessment for fluid, electrolyte, and acid-base alterations includes the nursing health history, physical and behavioural assessments, measurements of intake and output, daily weights, and specific laboratory data.
- Osmolar imbalances and FVD can be corrected by enteral or parenteral administration of fluid.
- Common complications of intravenous therapy are infiltration, phlebitis, infection, FVE, and bleeding at the infusion site.
- Blood transfusions are given to replace fluid volume loss from hemorrhage, treat anemia, or replace coagulation factors.
- Blood transfusions can be obtained from a donor, autologous, or obtained through perioperative salvage.
- Administration of blood or blood products requires the nurse to follow a specific procedure to identify transfusion reactions quickly.
- In addition to transfusion reactions, the risks of transfusion also include hyperkalemia, hypocalcemia, FVE, and infection.
- Treatment for electrolyte disturbances includes dietary and pharmacological interventions.
- The body's chemical buffering system responds first to acid-base abnormalities.
- The goals of therapy for acid-base imbalances are to treat the underlying illness and to restore the arterial blood pH to normal.
- With new technology emerging continually, nurses need to stay current on evidence to inform practice, particularly in relation to VADs.

❖ CRITICAL THINKING EXERCISES

1. Mrs. Emanuele is an 81-year-old woman admitted to the hospital with a three-day history of vomiting and diarrhea. She has had only ice chips since the first episode of vomiting and is now complaining of malaise, cramping muscles, and a temperature of 39°C. Which laboratory findings would you expect to be abnormal on the basis of her complaints? What interventions would you expect the physician to order?
2. Caroline, a nurse, has just received a new patient on her unit who is to receive one unit of RBCs within the next hour. What nursing actions are necessary before administering blood? Can Caroline delegate the administration of blood to a licensed practical nurse or an unregulated care provider?
3. Carlos is caring for Mr. Rossi, a 52-year-old man who has been seen in the emergency department following a motor vehicle accident. Mr. Rossi is complaining of difficulty breathing and has a respiratory rate of 40 breaths per minute. He is transferred to the intensive care unit, intubated, and placed on a ventilator. A nursing student asks Carlos to interpret Mr. Rossi's last ABG results: pH = 7.30; PaO₂ = 70; PaCO₂ = 50; bicarbonate = 24 mmol/L. What interpretation will Carlos give to the student nurse? What is the relationship between the ABG results and Mr. Rossi being intubated and ventilated?
4. Janelle is the nurse caring for Mrs. Kwan, a 59-year-old woman who has just had a total knee replacement. The physician has ordered cefazolin (Ancef) 1 g in 50 mL to run over 30 minutes intravenous piggyback three times daily. Mrs. Kwan has a continuous infusion of Ringer's lactate at 75 mL/hour in the left forearm. What type of tubing will Janelle use to administer the intravenous piggyback medication? Calculate the drops per minute of the piggyback using both microtubing (60 drops/mL) and macrotubing (15 drops/mL).

5. Mrs. Yoe is on a surgical unit following a total abdominal hysterectomy. She experienced postoperative bleeding and requires blood products; however, because of religious and cultural reasons, she has refused blood products. What are the key principles in providing care for Mrs. Yoe? How does a health promotion perspective inform your care? What other options are available, and how realistic or viable are these options?
6. A 24-year-old tennis professional was admitted to the clinic with a temperature of 41°C. He has a history of playing in a five-hour tennis match in 38°C heat. His coach brought him to the clinic because he was weak and lethargic. What assessment findings would you expect to find? What interventions would be necessary? Describe a teaching plan for this patient upon discharge.

✦ REVIEW QUESTIONS

1. One of the most common electrolyte imbalances is
 1. Hypokalemia
 2. Hyperkalemia
 3. Hyponatremia
 4. Hypocalcemia
2. The patient most at risk for FVDs is a(n)
 1. Older adult
 2. Young to middle adult
 3. Child
 4. Infant
3. One reason that older adults experience fluid and electrolyte imbalance and acid-base imbalances is that they
 1. Eat poor-quality food
 2. Have a decreased thirst sensation
 3. Have a more severe stress response
 4. Have an overly active thirst response
4. Output recorded on an intake and output record includes
 1. Urine, vomitus, diarrhea, and drainage from wounds
 2. Diarrhea, gastric suction, and drainage from wounds
 3. Medications, juices, and water
 4. Urine, diarrhea, vomitus, gastric suction, and drainage from wounds or tubes
5. Health promotion activities in the area of fluid and electrolyte imbalances focus primarily on
 1. Patient teaching
 2. Dietary intake
 3. Medication regimen
 4. Physician involvement in care
6. The nurse is aware that the following medication is never given directly intravenously:
 1. Potassium chloride (KCl)
 2. Furosemide (Lasix)
 3. Dextrose
 4. Calcium gluconate
7. Many factors are initially controlled for in the intravenous insertion procedure. The nurse understands that this begins with
 1. Hand hygiene
 2. Checking the sterility of supplies
 3. Ensuring the seven rights of medication administration
 4. Carefully checking the order for the intravenous therapy

8. Indications of intravenous fluid infiltration include
 1. Phlebitis and coolness
 2. Edema and erythema
 3. Pallor and coolness
 4. Pain and erythema
9. Recent evidence-informed review recommends that replacing peripheral venous catheters and rotating sites should occur
 1. Every 96 hours
 2. Every 72 hours
 3. When clinically indicated
 4. Every 48 hours
10. Fifteen minutes following blood administration, your patient develops dyspnea, a cough, and a rapid heart rate. You suspect
 1. Sepsis
 2. Anaphylaxis
 3. Acute hemolytic reaction
 4. Circulatory overload

✦ RECOMMENDED WEB SITES

Association for Vascular Access: <http://www.avainfo.org>

This Web site for the Association for Vascular Access has many links to conferences and national and international organizations in relation to venous access.

Canadian Association of Nephrology Nurses and Technologists: <http://www.cannnt.ca>

This association exists to promote excellence in the care of patients with renal disease. They provide leadership through education, research, and dissemination of research. Nephrology Nursing Standards are available from the Web site and include standards for holistic patient care across areas of practice, such as prevention, assessment, and nursing interventions.

Canadian Vascular Access Association: <http://www.cvaa.info/>
The Canadian Vascular Access Association provides leadership in advocating for safe, quality vascular access by promoting education, partnerships, knowledge, and research. The mission statement states the CVAA is "dedicated to the promotion and achievement of excellence in vascular access in Canada."

MedCalc: Acid-Base Calculator: <http://www.medcalc.com/acidbase.html>

The MedCalc acid-base program provides a calculator for acid-base status and anion gap. Other options are calculators for creatinine clearance, fractional excretion of sodium, free water deficit, and hypo- and hypernatremia.

Registered Nurses' Association of Ontario (RNAO) Nursing Best Practice Guidelines: <http://www.rnao.org> and click on Nursing Best Practice Guidelines or go to <http://www.rnao.org/Page.asp?PageID=861&SiteNodeID=133>

The Registered Nurses' Association of Ontario has developed Best Practice Guidelines for a number of aspects of nursing care, including intravenous therapy. These guidelines are based on current evidence and knowledge and constitute an excellent resource.

Review Question Answers

1. 1; 2. 4; 3. 2; 4. 4; 5. 1; 6. 1; 7. 1; 8. 3; 9. 3; 10. 4

Rationales for the Review Questions appear at the end of the book.

Sleep

Original chapter by Patricia A. Stockert, RN, BSN, MS, PhD

Canadian content written by Claudette Taylor, RN, MN

objectives

Mastery of content in this chapter will enable you to:

- Define the key terms listed.
- Define sleep.
- Compare the characteristics of rest and sleep.
- Explain the effect of the 24-hour sleep–wake cycle on biological functions.
- Discuss the mechanisms that regulate sleep.
- Describe the stages of a normal sleep cycle.
- Explain the functions of sleep and rest.
- Compare the sleep requirements of different age groups.
- Identify factors that normally promote sleep and factors that normally disrupt sleep.
- Discuss the characteristics of common sleep disorders.
- Conduct a sleep history for a patient.
- Identify nursing diagnoses appropriate for patients with sleep alterations.
- Identify nursing interventions designed to promote normal sleep cycles for patients of all ages.
- Describe ways to evaluate sleep therapies.

key terms

- | | |
|--|--|
| Biological clocks, p. 993 | Parasomnias, p. 996 |
| Cataplexy, p. 998 | Polysomnogram, p. 996 |
| Circadian rhythms, p. 993 | Rapid eye movement (REM) sleep, p. 993 |
| Emotional stress, p. 1002 | Rest, p. 999 |
| Excessive daytime sleepiness (EDS), p. 997 | Sedatives, p. 1014 |
| Hypersomnolence, p. 996 | Sleep, p. 993 |
| Hypnotics, p. 1014 | Sleep apnea, p. 997 |
| Insomnia, p. 996 | Sleep architecture, p. 1001 |
| Narcolepsy, p. 998 | Sleep deprivation, p. 999 |
| Nocturia, p. 996 | Sleep hygiene, p. 997 |
| Nonrapid eye movement (NREM) sleep, p. 993 | |

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Sleep is necessary for health. Sleep is a basic necessity of life and is as important as air, food, and water (National Sleep Foundation, 2009a). Everyone requires sleep. For a variety of reasons, individuals are, on average, sleeping less. Continual sleep loss may have many, yet largely unknown, outcomes for health and well-being. In the short term, insufficient sleep alters mood and decreases the ability to concentrate, make decisions, and participate in daily activities.

To help patients by identifying and treating their sleep pattern disturbances, you need to first understand the nature of sleep, the factors influencing sleep, and patients' sleep habits. Patients require an individualized approach that is determined on the basis of their personal habits and patterns of sleep and addresses the particular problem that is disrupting their sleep. Nursing interventions are often effective in resolving short- and long-term sleep disturbances.

Sleep provides healing and restoration (Van Cauter et al., 2008). Achieving the best possible sleep quality contributes to good health and to recovery from illness. Ill

patients often require more sleep and rest than healthy patients. The nature of illness, however, often prevents some patients from getting adequate rest and sleep. Sleep can also be made difficult by the environment of a hospital or long-term care facility and the activities of health care providers. Some patients have preexisting sleep disturbances, whereas other patients develop sleep problems as a result of illness or hospitalization.

Scientific Knowledge Base

Definition of Sleep

Sleep is a universal, dynamic, highly organized, physiological, and behavioural state required by most living organisms to maintain health and well-being (see Box 40-1) (Carskadon & Dement, 2011; Collop et al., 2008).

Physiology of Sleep

Sleep is a cyclical physiological and behavioural process that alternates with longer periods of wakefulness. Sleep physiology is controlled by three distinct processes: an *ultradian* process, a *homeostatic* process (process S), and a *circadian* process (process C). The ultradian process occurs within the sleep state and is characterized by the alteration of the two sleep stages: nonrapid eye movement (NREM) sleep and rapid eye movement (REM) sleep. Process S and process C work together to regulate the timing and organization of sleep and wakefulness. Process S is dependent on the sleep–wake cycle, whereas process C functions to maintain a state of wakefulness (Achermann & Borbély, 2011; Lee-Chiong, Jr., 2008).

Circadian Rhythms. The biological functions of most living organisms are regulated by **circadian rhythms**. The term *circadian* is derived from the Latin words *circa*, which means “about,” and *dien*, which means a day (Smith et al., 2008). People experience cyclical rhythms as part of their everyday life. The sleep–wake cycle is the most familiar of the 24-hour circadian rhythms. Numerous biological and behavioural functions are influenced by circadian rhythms. Changes in body temperature, for example, exhibit circadian rhythmicity. Normally, a person’s body temperature peaks in the afternoon, decreases gradually, and then drops sharply after a person falls asleep. The initial period of a person’s sleep is characterized by high levels of growth hormones and increased blood glucose concentrations, blood pressure, and heart rate. Sensory acuity and mood are also maintained by the 24-hour circadian cycle (Laposky et al., 2008).

Factors that affect circadian rhythms and daily sleep–wake cycles include light, temperature, social activities, and work

routines. All individuals have **biological clocks** that synchronize their sleep–wake cycles, which explains why some individuals fall asleep at 9 P.M., whereas others go to bed at midnight. Different individuals also function at their best at different times of the day.

Hospitals or extended care facilities usually do not adapt care to an individual’s sleep–wake cycle preferences. Typical hospital routines often interrupt sleep or prevent patients from falling asleep at their usual time. A person has poor quality of sleep if his or her sleep–wake cycle changes significantly. A serious illness is often indicated by reversals in the sleep–wake cycle, such as falling asleep during the day (or vice versa for people who work nights).

When the sleep–wake cycle is disrupted (e.g., by working rotating shifts), other physiological functions can also change. For example, the person may experience a decreased appetite and lose weight or may experience other common symptoms of sleep cycle disturbances, such as anxiety, restlessness, irritability, and impaired judgement. Failure to maintain the usual sleep–wake cycle can negatively influence the patient’s overall health.

Sleep Regulation. Sleep involves a sequence of physiological and behavioural states maintained by highly integrated central nervous system (CNS) activity, which is associated with changes in the autonomic nervous system and endocrine, cardiovascular, respiratory, gastrointestinal, renal, and musculoskeletal systems (Lee-Chiong, Jr., 2008). Each sequence of physiological states is identified by specific physiological responses and patterns of brain activity. Special instruments provide information about the structural and physiological aspects of sleep: for example, the electroencephalogram (EEG) measures electrical activity in the cerebral cortex, the electromyogram (EMG) measures muscle tone, and the electrooculogram (EOG) measures eye movements.

Current theory suggests that sleep is a dynamic multiphase process. The body’s major sleep centre is the hypothalamus. The hypothalamus secretes hypocretins (orexins) that promote wakefulness and sleep. The anterior pituitary gland also secretes hormones (e.g., growth hormone and prolactin) that promote sleep (Lee-Chiong, Jr., 2008).

Researchers believe the ascending reticular activating system (RAS), located in the upper brain stem, contains special cells that maintain alertness and wakefulness. The RAS receives visual, auditory, pain, and tactile sensory stimuli. Activity from the cerebral cortex (e.g., emotions and thought processes) also stimulates the RAS. Arousal, wakefulness, and maintenance of consciousness result from neurons in the RAS that release serotonin and catecholamines, such as norepinephrine and dopamine (Siegel, 2011).

Whether a person remains awake or falls asleep depends on a balance of impulses received from higher centres (e.g., thoughts), peripheral sensory receptors (e.g., sound or light stimuli), and the limbic system (e.g., emotions) (Figure 40-1). As a person tries to fall asleep, the eyes close and the body assumes a relaxed position. Stimuli to the RAS decline. If the room is dark and quiet, activation of the RAS further declines. At some point, an area of the brain called the bulbar synchronizing region (BSR) takes over, causing sleep.

Stages of Sleep. Changes in brainwave activity, muscle tone, body temperature, and eye movements are associated with different stages of sleep (Billard, 2008). Within sleep, two separate phases have been identified: **nonrapid eye movement (NREM) sleep** and **rapid eye movement (REM) sleep** (see Box

► BOX 40-1

Behavioural Characteristics of Sleep

- Periodic
- Involuntary
- Reversibility
- Reduced responsiveness to environment
- Minimal movement
- Closed eyes
- Species-specific posture

Source: Carskadon, M. A., & Dement, W. C. (2011). Normal human sleep: An overview. In M. H. Kryger, T. Roth, & W. C. Dement (Eds.), *Principles and practice of sleep medicine* (5th ed., pp. 16–41). Philadelphia, PA: Elsevier.

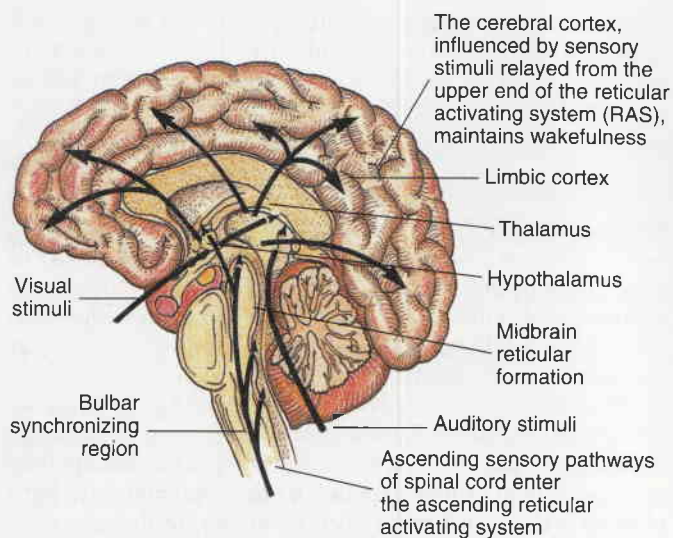


Figure 40-1 The reticular activating system and the bulbar synchronizing region control sensory input by intermittently activating and suppressing the brain's higher centres to control sleep and wakefulness.

40-2). During NREM sleep, a sleeper progresses through four stages (stages 1, 2, 3, and 4) of increasingly deeper sleep. Stage 1, a light and drowsy sleep, occurs at the beginning of sleep and is the transitional stage between wakefulness and sleeping. Stage 2 is a deeper stage of sleep; however, a sleeper may be easily aroused during this stage of sleep. Stages 3 and 4 involve a deeper sleep, and these stages are referred to as delta sleep or slow-wave sleep (SWS). Delta sleep or SWS sleep are thought to be the most restorative of all the sleep stages. Most recently, the American Academy of Sleep Medicine has revised the classification of NREM sleep into three NREM stages (Stages 1, 2, and 3, with 3 representing the traditional stages of 3 and 4). REM sleep, also known as paradoxical sleep, follows NREM sleep and is not divided into stages. REM sleep shares some characteristics of NREM sleep and of wakefulness. REM sleep is "paradoxical" in the sense that, although a person is behaviourally asleep, the individual is physiologically active—brain activity is high, rapid eye movements are occurring, twitches of the extremities occur, and males frequently develop erections (Siegel, 2011). The most characteristic feature of REM sleep is dreaming. REM sleep dreams are often vivid and emotional (Billard, 2008; Van Cauter et al., 2008). REM sleep is the phase at the end of each sleep cycle.

Different factors promote or interfere with various stages of the sleep cycle. It is important to choose therapies that promote sleep and eliminate factors that disrupt it.

Sleep Cycle. The normal sleep pattern for an adult begins with a presleep period during which the person is aware of only gradually developing sleepiness. This period normally lasts 10 to 30 minutes, but if a person has difficulty falling asleep, it can last an hour or longer. Once asleep, the person usually passes through four to five complete sleep cycles per night, each consisting of four stages of NREM sleep and a period of REM sleep (Billard, 2008). Sleep begins when adults enter stage 1 NREM sleep. This stage usually persists for only a few minutes, and sleep may be easily interrupted by calling the person's name or by touching them. Stage 2 NREM sleep follows and continues for approximately 10 to 25 minutes. In

► BOX 40-2 Stages of the Sleep Cycle

Stage 1: Nonrapid Eye Movement

This stage represents the lightest level of sleep.

Person is unresponsive but easily aroused by sensory stimuli, such as noise.

Physiological activity begins to decrease, accompanied by a gradual fall in vital signs and metabolism.

Muscle tone is present.

When awakened from this stage, a person feels as though he or she had been daydreaming.

This stage lasts only a few minutes.

Accounts for about 2% to 5% of total sleep time in adults.

Stage 2: Nonrapid Eye Movement

This stage is a period of sound sleep.

Relaxation progresses.

Body functions continue to slow.

Muscle tone remains present.

Eye movements are absent.

Accounts for the greatest proportion (45% to 55%) of total sleep time in adults.

Stage 3: Nonrapid Eye Movement

This stage begins the initial period of deep sleep.

Individuals are difficult to arouse.

Muscles become completely relaxed.

Vital signs decline but remain regular.

Parasomnias sometimes occur during this stage (e.g., sleepwalking, enuresis [bedwetting]).

Accounts for 10% of total sleep time in adults and is more prominent during the first half of sleep.

Stage 4: Nonrapid Eye Movement

This stage is the deepest period of sleep.

Individuals are difficult to arouse.

If sleep loss has occurred previously, the sleeper will spend a considerable portion of the sleep period in this stage.

The vital signs are significantly lower than during waking hours.

Parasomnias sometimes occur during this stage (e.g., sleepwalking and enuresis [bedwetting]).

Accounts for 10% of total sleep time in adults and is more prominent during the first half of sleep.

Rapid Eye Movement Sleep

Rapid eye movements are present.

Respirations are irregular and shallow.

Variable heart rate and blood pressure.

Vivid and elaborate dreams sometimes occur.

Dreaming occurs more frequently and is more complex compared with NREM sleep.

This stage usually begins about 90 minutes after sleep has begun.

Loss of skeletal muscle tone occurs.

Gastric secretions increase.

The person is difficult to arouse.

The duration of REM sleep increases with each cycle.

Accounts for about 25% of total sleep time in adults.

Sources: Billard, M. (2008). Normal sleep. In H. R. Smith, C. L. Comella & B. Hogl (Eds.), *Sleep medicine* (pp. 9–24). Cambridge, New York: Cambridge University Press; and Lee-Chiong, Jr., T. (2008). *Sleep medicine: Essentials and review*. New York: Oxford University Press.

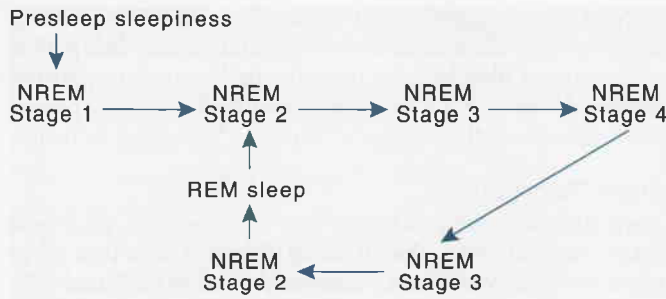


Figure 40-2 The stages of the adult sleep cycle.

stage 2, a person is not so easily awakened. Stages 3 and 4 NREM sleep and REM sleep follow and complete the sleep cycle (Figure 40-2). NREM sleep and REM sleep continue to alternate throughout a night in this cyclical pattern (Carskadon & Dement, 2011; Lee-Chiong, Jr., 2008). The number of sleep cycles depends on the total amount of time that a person spends sleeping.

The average length of the first cycle is 90 minutes, and subsequent cycles may last between 100 and 120 minutes. During the night, the NREM/REM sleep cycle is repeated three to six times, and with each cycle less time is spent in Stage 3 and 4 NREM sleep while the proportion of time spent in REM sleep increases. Of the total sleep time, 75% to 85% is spent in NREM sleep.

Not all people progress consistently through the stages of sleep. For example, a sleeper may move back and forth for short intervals between the NREM stages 2, 3, and 4 before entering the REM stage. The amount of time spent in each stage varies over a person's lifespan. Newborns and children spend more time in deep sleep or slow-wave sleep (SWS). SWS is highest in children, and for this reason it is very difficult to wake young children from this stage of sleep. As individuals age, sleep becomes more fragmented and less time is spent in deep sleep (Carskadon & Dement, 2011; Lee-Chiong, Jr., 2008).

Functions of Sleep

Although we spend a third of our time sleeping, many of the reasons why we sleep have yet to be discovered and understood. Many functions have been proposed, and all of these may be partially correct. It has been proposed that sleep allows for physiological and psychological restoration (Van Cauter et al., 2008). During NREM sleep, biological functions slow. Normally, in daytime hours the heart rate of a healthy adult averages 70 to 80 beats per minute, or less if the individual is in excellent physical condition. During sleep, the heart rate slows, beating 10 to 26 fewer times each minute or 60 to 120 fewer beats each hour. Clearly, restful sleep is beneficial in preserving cardiac function. Other biological functions also decrease during sleep; for example, respirations, blood pressure, muscle tone, urine production, and hormone secretion (Carskadon & Dement, 2011).

The body needs sleep for physiological restoration such as cell and tissue repair. Increased cell mitosis and increased protein synthesis have been observed during periods of NREM sleep (Van Cauter et al., 2008).

REM sleep is necessary for brain tissue restoration and appears to be important for cognitive restoration (Lee-Chiong, Jr., 2008). REM sleep is associated with changes in cerebral

blood flow, increased cortical activity, increased oxygen consumption, and epinephrine release (Carskadon & Dement, 2011). During sleep, the brain filters stored information about the day's activities. The benefits of sleep on behaviour often go unnoticed until a problem develops as a result of sleep deprivation. A loss of REM sleep leads to feelings of confusion and suspicion.

Sleep is also believed to be important for immune function, renal function, regulation of body temperature, metabolism of glucose, and hormone secretion (Collop et al., 2008; Tibbitts, 2008).

In addition to physical functioning, sleep is essential for psychological and social functioning. Without sleep, individuals are irritable and anxious and often report high levels of stress.

Dreams. Dreaming is defined as a mental activity that occurs while individuals are asleep. Dreams can occur during both NREM and REM sleep. The majority of dreams take place in the REM sleep stage. REM sleep-related dreams are often vivid and elaborate, whereas NREM dreams are simpler and more realistic (Lee-Chiong, Jr., 2008; Nielsen, 2011).

Studies of across-the-night changes in the characteristics of dreams suggest that dreams become more realistic as the night progresses. Dream content also appears to parallel cognitive and emotional development, as the recollection of dreams reported by children and adults is quite different (Stickgold & Wamsley, 2011).

Determinants of dreams, aside from age, include personality, physiological conditions (e.g., pregnancy), psychological conditions, pharmacological therapies, and situational factors. Personality also influences the quality of dreams; for example, a creative person has elaborate and complex dreams, whereas a depressed person dreams of helplessness (Stickgold & Wamsley, 2011). Most people dream about their immediate concerns, such as an argument with a spouse or worries over work. Sometimes a person is unaware of the fears represented in bizarre dreams. Clinical psychologists can try to analyze the symbolic nature of dreams as part of a patient's psychotherapy. The ability to describe a dream and interpret its significance sometimes helps resolve personal concerns or fears.

Numerous theories have been proposed as to why individuals dream. For centuries, dreams have been seen as messages from the gods, and this belief is upheld by many cultures today. Sigmund Freud theorized that dreams were the expression of an individual's unconscious desires and that by exploring dreams, emotional problems could be cured (Stickgold & Wamsley, 2011).

Physical Illness

Any illness that causes pain, physical discomfort, or mood problems, such as anxiety or depression, often results in sleep problems. Individuals who are ill frequently have trouble falling asleep or staying asleep. Illnesses can also force patients to sleep in unfamiliar positions. For example, when an arm or leg is in traction, patients have a difficult time finding a comfortable position for sleep.

Respiratory disease often interferes with sleep. While individuals sleep, their level of blood oxygen decreases. In healthy individuals, this decrease can be compensated easily while individuals with respiratory diseases often require supportive devices, practices, or therapies to assist them while they are sleeping (Agarwal et al., 2009). Symptoms associated with respiratory diseases may require individuals to alter their

position to facilitate sleeping. For example, individuals with chronic obstructive lung disease, such as emphysema, are frequently short of breath and often require two or three pillows to sleep (Lee-Chiong, Jr., 2008).

Cardiovascular diseases interfere with sleep (Box 40-3). Chest pain, shortness of breath, diaphoresis, nausea, and palpitations, all symptoms associated with cardiovascular disease, frequently occur during the night and disrupt sleep. Hypertension often causes early morning awakening and fatigue (Lee-Chiong, Jr., 2008).

The sleep of individuals with musculoskeletal disorders such as osteoarthritis and rheumatoid arthritis may be disrupted by the pain that often accompanies these conditions (Lavigne et al., 2011).

BOX 40-3 RESEARCH HIGHLIGHT

Sleep Duration and Obesity

Research Focus

Research has shown an association between obesity, sleep time, and the occurrence of sleep disorders. The prevalence of obesity has increased considerably over the past 25 years and is currently considered a global epidemic (Magee et al., 2008). Obesity refers to an excess of body fat and is a disorder that occurs when body fat excess impairs the health of individuals. Obesity is associated with an increased risk of many chronic diseases, including heart disease, diabetes, hypertension, and cancer (Anic et al., 2010). Prior research has shown obesity increases morbidity and mortality.

Shorter sleep time have become increasingly more prevalent in Western countries because of many reasons, including lifestyle choices, work or family requirements, or existing physical or psychological problems. Over the past several years, sleep duration in adults has decreased, on average, by 1.5 to 2 hours per night, and many individuals are reporting sleeping less than 6 hours per night. Researchers wanted to determine whether shorter sleep time increases the risk of obesity.

Research Abstract

Researchers (Patel, Blackwell, et al., 2008) assessed the sleep pattern of 3,110 older men and 3,219 older women using wrist actigraphy, an objective method of sleep assessment. Study results demonstrated that a sleep duration of less than five hours was associated with an increased body mass index and truncal (abdominal) fat, the fat also associated with cardiovascular disease and diabetes.

Evidence-Informed Practice

- During your assessment of a patient's health problems, ensure that you ask questions related to sleep quality and sleep patterns.
- If the patient indicates a problem with sleep, conduct a thorough sleep history.
- Reinforce good sleep hygiene habits.
- Encourage patients to notify their health care provider if they begin to experience sleep problems.
- Reinforce healthy eating habits.
- Encourage patients to seek the advice of other health care providers (e.g., dietitian, nutritionist).

Reference: Patel, S. R., Blackwell, T., Redline, S., Ancoli-Israel, S., Cauley, J. A., Hillier, T. A., ... & Stone, K. L. (2008). The association between sleep duration and obesity in older adults. *International Journal of Obesity*, 32(12), 1825-1834.

Nocturia, or urination during the night, disrupts sleep and the sleep cycle. This condition is most common in older people with reduced bladder tone or individuals who have cardiac disease, diabetes, or problems with elimination. After a person awakens repeatedly to urinate, returning to sleep is difficult.

Sleep Disorders

Sleep disorders are conditions that interfere with nighttime sleep. Currently, more than 80 sleep disorders have been identified in the literature. The American Academy of Sleep Medicine developed the International Classification of Sleep Disorders version 2 (ICSD2), which classifies these disorders into eight major categories (Box 40-4).

Increasingly, evidence suggests sleep disorders are related to serious medical conditions. Individuals with sleep disorders are at risk for developing hypertension, diabetes, and cardiovascular and neurological diseases. Sleep disorders can affect individuals of all ages, and the prevalence of these disorders increases with advancing age (Bloom et al., 2009). Individuals with sleep disorders may complain of difficulty falling asleep or staying asleep, daytime sleepiness, **hypersomnolence** or abruptly falling asleep during the daytime (Bae & Avidan, 2008).

The insomnias are primary disorders related to difficulty falling asleep. Individuals with sleep-related breathing disorders have disordered respirations during sleep. Hypersomnia not due to sleep-related breathing disorders is a group of disorders that are not caused by disturbances in circadian rhythms or in nocturnal sleep. The **parasomnias** are undesirable behaviours that usually occur during sleep. Sleep disturbances and wake disturbances are associated with many medical and psychiatric sleep disorders, including psychiatric, neurological, and other medical disorders. The circadian rhythm sleep disorders are caused by a misalignment between the timing of sleep and the societal norm or the desires of the individual. In sleep-related movement disorders, the person experiences movements such as leg cramps or teeth grinding that disturb sleep. The "other sleep disorders category" contains sleep problems that do not fit into other categories.

Sleep laboratory studies are often used to diagnose a sleep disorder (Chervin, 2011). A **polysomnogram** involves the use of EEG, EMG, and EOG to monitor stages of sleep and wakefulness during nighttime sleep. The Multiple Sleep Latency Test (MSLT) provides objective information about sleepiness and selected aspects of sleep structure by measuring eye movements, muscle tone changes, and brain electrical activity during at least four napping opportunities spread throughout the day. The MSLT takes 8 to 10 hours to complete. Patients wear an Actigraph device on the wrist to measure sleep-wake patterns over an extended period of time. Actigraphy data provide information such as sleep time, number and duration of awakenings, and levels of activity and rest (Chervin, 2011).

Insomnia. Patients experience **insomnia** when they report problems falling asleep, staying asleep, or nonrestorative sleep. Insomnia is the second most commonly expressed complaint reported in clinical practice after pain and the most common self-reported sleep-related complaint (Wyatt & Crisostomo, 2008). Insomnia is more common in women and its incidence increases with advancing age (Doghranji, 2010). Insomnia may be transient and may indicate an underlying physical or psychological disorder (Reeve & Bailes, 2010). People experience *transient insomnia* as a result of schedule

► BOX 40-4 Classification of Sleep Disorders

Insomnias

Acute insomnia (duration of less than one month)
 Primary insomnia (unrelated to any other disorder)
 Co-morbid insomnia (due to a medical condition)
 Nonrestorative sleep
 Early morning awakening

Sleep-Related Breathing Disorders

Sleep apnea

Obstructive sleep apnea syndrome
 Central sleep apnea syndromes
 Primary central sleep apnea
 Central sleep apnea due to a drug or substance
 Central sleep apnea due to a medical condition

Snoring

Upper airway resistance syndrome

Excessive Sleepiness

Narcolepsy
 Narcolepsy secondary to medical disorders
Hypersomnias
 Idiopathic hypersomnia (no identifiable cause)
 Recurrent hypersomnia (repeated episodes of hypersomnia)
 Post-traumatic hypersomnia (associated with head injuries)
 Menstrual-related hypersomnia
 Behaviourally induced Insufficient Sleep Syndrome

Parasomnias

Disorders of Arousal

Sleepwalking
 Sleep terrors

Parasomnias Usually Associated With REM Sleep

Nightmare disorder
 REM sleep behaviour disorder
 Sleep paralysis

Other Parasomnias

Sleep-related groaning
 Sleep-related hallucinations
 Sleep-related eating disorder
 Sleep-related enuresis (bedwetting)
 Due to drug or substance
 Due to a medical condition

Circadian Rhythm Sleep Disorders

Primary Circadian Rhythm Sleep Disorders

Delayed sleep phase type
 Advanced sleep phase type

Behaviourally Induced Circadian Rhythm Sleep Disorders

Jet lag type
 Shift work type
 Delayed sleep phase type
 Drug or substance use

Sleep-Related Movement Disorders

Restless leg syndrome
 Periodic limb movements
 Sleep-related leg cramps
 Sleep-related bruxism (teeth grinding)

Isolated Symptoms, Apparently Normal Variants, and Unresolved Issues

Long sleeper
 Short sleeper
 Snoring
 Sleep talking
 Benign sleep myoclonus of infancy

Other Sleep Disorders

Physiological (organic) sleep disorders
 Environmental sleep disorder
 Sleep disorder not due to a substance or physiological condition

Adapted from American Academy of Sleep Medicine: International classes of diseases and international classification of sleep disorders, as cited in Thorpy, M. (2011). Classification of sleep disorders. In M. Kryger, T. Roth, & W. C. Dement (Eds.), *Principles and practice of sleep medicine* (5th ed., pp. 680, 693). Philadelphia, PA: Elsevier.

changes (shift work, travel), situational crises, particular medications, and excessive intake of alcohol or caffeine. However, transient insomnia may lead to chronic difficulty in obtaining sufficient sleep if causes are not addressed (Reeve & Bailes, 2010).

Insomnia is often associated with poor **sleep hygiene**, behaviours that are problematic for initiating sleep and maintaining sleep. Management of insomnia depends on whether it is transient or indicative of an underlying disorder. Treatment may include nonpharmacological therapies such as relaxation therapy, cognitive-behavioural therapy, or pharmacological agents (e.g., hypnotics).

Behavioural and cognitive therapies have few adverse effects and show evidence of sustained improvement in sleep over a six-month period (Doghranji, 2010; Snowden, 2008).

Sleep Apnea. Sleep apnea is a disorder in which people stop breathing for a period of at least 10 seconds while asleep (Ramar & Guilleminault, 2008). There are two types of sleep apnea: obstructive sleep apnea (OSA) and central sleep apnea. Obstructive sleep apnea is the most common form of sleep

apnea and results from an obstruction of the upper airway (Cao et al., 2011). Central sleep apnea represents a loss of inspiratory effort due to an underlying pathological condition (Ramar & Guilleminault, 2008).

Risk factors for developing OSA include age, obesity, gender, ethnicity, smoking, alcohol, and a positive family history. OSA is more common in Asians than in Caucasians. OSA may affect middle-aged men more frequently, particularly when they are obese. Obstructive sleep apnea is also common in postmenopausal women and in younger women and children (Ramar & Guilleminault, 2008).

Excessive daytime sleepiness (EDS) and fatigue are the most common complaints of individuals who have OSA. Those who have severe OSA often report taking daytime naps and experience a disruption in their daily activities because of sleepiness. Feelings of sleepiness are usually most intense when waking up just after falling asleep and approximately 12 hours after the midsleep period.

In addition to reports of excessive daytime sleepiness, other symptoms of OSA are fatigue, morning headaches, choking or

gasping upon awakening, irritability, depression, difficulty concentrating, and decreased sex drive (Cao et al., 2011; Ramar & Guilleminault, 2008). Snoring is a distinguishing characteristic of OSA, as nearly all patients with this disorder snore (Cao et al., 2011).

OSA occurs when the muscles or structures of the oral cavity or throat relax during sleep. The upper airway becomes partially or completely blocked, thereby diminishing the nasal airflow (hypopnea) or stopping it (apnea) for as long as 10 to 30 seconds (Cao et al., 2011). The person still attempts to breathe; chest and abdominal movements continue and often result in loud snoring and snorting sounds. When breathing is partially or completely diminished, each successive diaphragmatic movement becomes stronger until the obstruction is relieved. Apneic episodes are normally terminated by gasps, snorting, or brief periods of awakening.

Structural abnormalities such as a deviated septum, nasal polyps, certain jaw configurations, or enlarged tonsils predispose a patient to obstructive sleep apnea. The effort to breathe during sleep results in arousals from deep sleep often to the stage 2 cycle. In severe cases, hundreds of hypopnea or apnea episodes occur every hour, resulting in severe interference with deep sleep.

Obstructive sleep apnea causes a serious decline in the saturation level of arterial oxygen. Patients with OSA are at risk for cardiac dysrhythmias, heart failure, pulmonary hypertension, angina, stroke, hypertension, and metabolic syndrome. Sleep apnea contributes to high blood pressure and increased risk for heart attack and stroke (National Sleep Foundation, 2009a).

Patients who have OSA rarely achieve deep sleep because sleep is often fragmented. OSA may exact a heavy emotional toll on the individuals affected and their families. OSA may affect marital relationships and interactions within and outside the family, and frequently is an embarrassment to the patient (National Sleep Foundation, 2009a). Treatment for OSA includes continuous positive airway pressure (CPAP). CPAP consists of a mask that fits over the nose and mouth through which air is continuously delivered into the airway to assist in keeping it open during sleep (Ramir & Guilleminault, 2008). Other treatments include addressing the underlying cardiac or respiratory complications and emotional problems that occur as a result of the symptoms of this disorder (Atwood, Jr., et al., 2011).

Narcolepsy. Narcolepsy is a common complex neurological sleep disorder for which there is no known cure. Narcolepsy is known to affect men and women of any age; however, it usually appears in adolescence. The clinical manifestations of narcolepsy are highly variable. Excessive daytime sleepiness is the most common complaint associated with narcolepsy. During the day, a person who has narcolepsy may suddenly feel an overwhelming wave of sleepiness and fall asleep (Ahmed & Thorpy, 2010). Narcolepsy is known to have a significant impact on REM sleep and is also known to intensify the emotions associated with this stage of sleep. Many individuals with narcolepsy experience hallucinations, vivid dreams, night terrors, sleepwalking, sleep paralysis, and poor memory and concentration, or the feeling of being unable to move or talk just before waking or falling asleep. **Cataplexy**, or sudden bilateral (occasionally unilateral) loss of muscle tone accompanied by an overpowering urge to sleep, can occur at any time during the day and can last from a few seconds to as long as 30 minutes. These episodes are sporadic and can occur

occasionally to several times per day. A history of cataplexy may be obtained by inquiring whether the loss of muscle tone occurs during the following: upon hearing or telling a joke, while laughing, or when angry. Other triggers are embarrassment, surprise, stress, or sexual arousal (Ahmed & Thorpy, 2010; Cook, 2008a, 2008b). Some studies show a genetic link for narcolepsy (Faraco & Mignot, 2011).

Narcolepsy may also affect energy levels, metabolism, appetite, and feelings of mental well-being. Individuals with narcolepsy can have intense cravings for carbohydrates; greater than one-third of individuals with narcolepsy suffer from obesity (Smith et al., 2008).

Most people with narcolepsy tend to be diagnosed several years after the onset of the condition, which means most of the symptoms associated with this disorder go untreated. Prior to diagnosis, individuals are frequently regarded as “different,” antisocial, lacking in motivation, and uncooperative (Jennum et al., 2009).

There is no known cure for narcolepsy, and therefore treatment is targeted at symptom management. Traditionally, individuals with narcolepsy have been treated by two groups of drugs: stimulants and antidepressants. Stimulants promote wakefulness and reduce the frequency of sleeping episodes. Modafinil is a wakefulness-promoting agent and has been shown to improve symptoms of fatigue and improve cognitive function (memory and concentration).

Antidepressants suppress cataplexy and other REM-related symptoms (Ahmed & Thorpy, 2010; Cook, 2008a, 2008b). Nonpharmacological management should be initiated in all individuals. Education is an important component of the treatment plan for individuals with narcolepsy. Good sleep hygiene should be emphasized. The fundamental principles of sleep hygiene are listed in Box 40-5. Other management strategies are to follow a regular exercise program, take strategically timed daytime naps (if possible), eat light meals that are high in protein, practice deep breathing, chew gum, and take vitamins (Cook, 2008b). Patients who have narcolepsy need to avoid factors that increase drowsiness (e.g., alcohol, heavy meals, exhausting activities, long-distance driving, and extended periods of sitting in hot, stuffy rooms).

Parasomnias. Parasomnias are undesirable sleep problems that occur while falling asleep, between sleep phases, or during transitions from sleep to wakefulness. The word *parasomnia* is derived from the Greek word *para* combined with the Latin word *somnus* meaning event accompanying sleep (Silvestri & Arico, 2008). The parasomnia may range from

BOX 40-5

Sleep Hygiene: Fundamental Principles

- Avoid late afternoon naps.
- Decrease consumption of caffeine, tobacco, and alcohol.
- Exercise regularly, but not prior to bedtime.
- Eat regular meals, do not go to bed hungry, and decrease consumption of liquids in the evening.
- Maintain a regular sleep-wake schedule, even on weekends.
- Maintain the bedroom as an environment solely for sleep.
- Ensure a sleeping environment that is comfortable and quiet.

Source: Milner, C. E., & Belicki, K. (2010). Assessment and treatment of insomnia in adults: A guide for clinicians. *Journal of Counseling & Development*, 88, 236-244.

abnormal sleep-related movements to emotions, perceptions, dreaming, or behaviours. Parasomnia may be the manifestation of an underlying physical or psychological disorder or may be caused by the ingestion of drugs or other substances (Lee-Chiong, Jr., 2008). Parasomnias are more common in children than in adults (Verrier & Josephson, 2011).

Parasomnias that occur among older children include somnambulism (sleepwalking), night terrors, nightmares, nocturnal enuresis (bedwetting), body rocking, and bruxism (teeth grinding). When adults experience these symptoms, more serious disorders are often indicated. Specific treatment for these disorders varies; however, in all cases patients need to be supported and their safety maintained.

Shift Work. *Shift work sleep disorder* (SWSD) is a common sleep disorder experienced by individuals who work outside the traditional 9-to-5 workday. Most commonly associated with nighttime work, the health and economic consequences of this disorder are profound. Studies suggest that individuals who engage in shift work have a high risk of developing cardiovascular disease. The most common problems reported by shift workers are excessive sleepiness, fatigue, and insomnia resulting from imposing a sleep-wake schedule that is contrary to the body's internal circadian clock. Not all individuals exposed to shift work develop this disorder (Drake & Wright, Jr., 2011).

Sleep Deprivation. Sleep deprivation refers to insufficient sleep during a specific time period. The most common causes of sleep deprivation are lifestyle factors or work-related factors. One approach to understanding the functional significance of sleep is to consider the behavioural and physiological effects of sleep deprivation. Numerous studies on animal models subjected to periods of sleep deprivation demonstrated that sleep deprivation resulted in changes in metabolism (weight loss despite increased food intake), impaired glucose metabolism, increased heart rate, skin lesions, decreased body temperature, and, with prolonged periods, death (Van Cauter et al., 2008).

There are several types of sleep deprivation. Sleep deprivation may be observed as a reduction in sleep time where sleep time does not meet the needs of the individual, prolonged wakefulness, and sleep disruption related to a pathophysiological process (e.g., cancer). The extent to which an individual experiences the effects of sleep deprivation depends on the physiological and behavioural requirements of the individual (Orezel-Gryglewska, 2009). Additionally, the effects of sleep deprivation are cumulative, meaning a mild reduction in sleep time over a prolonged period may be detrimental to the individual (Tibbitts, 2008).

Sleep deprivation may be experienced by individuals for a variety of reasons. Causes include illness (e.g., fever, difficulty breathing, or pain), emotional stress, certain medications, environmental disturbances (e.g., noise, unfamiliar surroundings, frequent nursing care), and variability in the timing of sleep due to shift work and travel. Factors contributing to sleep deprivation in hospitalized patients are outlined in Box 40-6. Physicians and nurses are particularly prone to sleep deprivation due to their long work schedules and rotating shifts (Elliott et al., 2011; Lei et al., 2009). Hospitalization, especially in intensive care units (ICUs), makes patients particularly vulnerable to periods of sleep deprivation. Constant environmental stimuli within the ICU, such as strange noises from equipment, invasive equipment and procedures, the frequent monitoring and care given by nurses, and continuous light,

lead to an inability to sleep. Numerous studies have confirmed that ICU patients frequently experience sleep deprivation (Drouot et al., 2008; Elliot et al. 2011).

A person's response to sleep deprivation is highly variable. Patients exhibit a variety of physiological and psychological symptoms (Box 40-7). The severity of symptoms is often related to the duration of sleep deprivation. The most effective treatment for sleep deprivation is the elimination or correction of factors that disrupt the sleep pattern. You play an important role in identifying patients' treatable sleep deprivation problems.

Nursing Knowledge Base

Sleep and Rest

When persons are at **rest**, they usually feel mentally relaxed, free from anxiety, and physically calm. Rest does not imply

► BOX 40-6

Causes of Sleep Deprivation in Hospitalized Patients

Environmental Factors

- Noise
- Uncomfortable bed and pillows
- Bright lights
- Pathophysiological factors
- Pain and discomfort
- Use of invasive equipment such as intravenous lines, nasogastric tubes

Emotional Factors

- Stress, worry
- Lack of control
- Lack of privacy
- Anxiety about procedures and outcomes of investigations

► BOX 40-7

Sleep Deprivation Symptoms

Physiological Symptoms

- Ptosis, visual disturbances such as blurred vision
- Clumsiness in fine motor skills
- Decreased reflexes
- Slowed response time
- Decreased reasoning and judgement
- Decreased auditory and visual alertness
- Cardiac arrhythmias
- Increased food intake
- Decreasing satiety
- Weight loss

Psychological Symptoms

- Easily distracted
- Confusion and disorientation
- Forgetfulness
- Increased sensitivity to pain
- Irritability, withdrawal, apathy
- Excessive sleepiness
- Poor concentration
- Agitation
- Hyperactivity
- Decreased motivation

inactivity, although rest is often thought of as the act of settling down in a comfortable chair or lying in bed. Usually, when individuals are at rest, they are in a state of mental, physical, and spiritual activity that leaves them feeling refreshed, rejuvenated, and ready to resume the activities of the day. Individuals have their own habits for obtaining rest and can adjust to new environments or conditions that affect their ability to rest. Rest is gained from reading a book, practising a relaxation exercise, listening to music, taking a long walk, or sitting quietly.

Illness and unfamiliar health care routines can easily affect the usual rest and sleep patterns of individuals entering a hospital or other health care facility. You may frequently care for patients on bedrest, which confines patients to the bed to reduce the physical and psychological demands on their body. Patients may not necessarily feel rested because they may still have emotional worries that prevent complete relaxation. For example, concern over physical limitations or a fear of being unable to return to their usual lifestyle can cause patients to feel stressed and unable to relax. You must always be aware of the patient's need for rest. Long periods without rest can lead to illness or to the worsening of an existing illness.

Normal Sleep Requirements and Patterns

Individual requirements for sleep duration and quality vary among individuals of all age groups. For example, one person may feel adequately rested after 6 hours of sleep, whereas another person may require 10 hours of sleep.

Neonates. During the first few weeks of life, newborns sleep about 16 hours a day, sleeping almost constantly during the first week. Sleep occurs equally across the day and night in newborns and is more strongly influenced by hunger than by light-dark cues. The sleep cycle of newborns is generally 40 to 50 minutes with waking occurring after one to two sleep cycles. Sleep is classified as active sleep (REM sleep equivalent) or quiet sleep (NREM sleep equivalent). A third stage has also been identified and is known as indeterminate sleep. This sleep stage cannot be defined as either quiet sleep or active sleep by polysomnography. Newborn sleep cycles begin with active sleep; newborns spend the majority of their sleep time in this stage of sleep. The primary function of active sleep is thought to allow for the continued development of neural pathways (Crabtree & Williams, 2009; Lee-Chiong, Jr., 2008).

Infants. By three months, the amount of time the newborn spends in active sleep (REM sleep equivalent) diminishes, the required hours for sleep gradually decrease, and sleep-wake periods develop into a day/night cycle. By six months of age, infants enter sleep through NREM sleep. The ability to sleep during the night develops by six to nine months of age. At this point, the infant's sleeping pattern is characterized by a nocturnal sleep period of 10 to 12 hours' duration, two to three daytime naps, which collectively amount to 12 to 14 hours of total sleep time. Awakening commonly occurs early in the morning, although awakening during the night is not unusual (Crabtree & Williams, 2009; Lee-Chiong, Jr., 2008).

Toddlers. By two years of age, most children usually require 12 to 14 hours of sleep each day, which generally includes a nap in the afternoon and, for some, a morning nap as well. This amount of sleep is needed to re-energize the toddler and for continued growth and development. Lack of sleep makes a toddler feel tired and irritable. Awakening during the night is common for toddlers. A variety of factors

may influence night waking, including dreams and a fear of being separated from their parents. During this period, the percentage of REM sleep continues to fall (Crabtree & Williams, 2009; Hockenberry & Wilson, 2007).

Preschoolers. A preschooler sleeps about 13 hours a night (about 20% of which is REM sleep). By five years of age, the preschooler rarely takes daytime naps, except in cultures where siestas are the custom (Hockenberry & Wilson, 2007). The preschooler usually has difficulty relaxing or quieting down after long, active days and may experience bedtime fears, waking during the night, or nightmares. Partial waking, followed by a normal return to sleep, is frequent (Hockenberry & Wilson, 2007). In the waking period, the child may exhibit brief episodes of crying, walking aimlessly, unintelligible speech, sleepwalking, or bedwetting. Numerous factors may influence the sleep pattern of preschoolers, including day care and preschool schedules, family routines, and parental expectations as to the amount of sleep required for this developmental stage (Crabtree & Williams, 2009).

School-Aged Children. The amount of sleep needed varies during the school-age years. Both gender and ethnicity may explain the variability of sleep patterns in school-aged children. A longer sleep cycle has been observed in school-aged girls compared with their same-aged male counterparts. Caucasian children have more NREM stage 1 sleep and less NREM stage 2 sleep than African American children. Most school-aged children sleep between 9 and 10 hours each night. Epidemiological studies of school-aged children have shown shorter sleep times are associated with behavioural problems and symptoms of depression (Paavonen et al., 2009; Seo et al., 2010).

Adolescents. The sleep pattern of adolescents is variable across a seven-day week, with shorter sleep times occurring during the school week. Consecutive nights of shorter sleep results in "sleep debt," with adolescents recovering this sleep on weekends with longer sleep times. The demands of school (e.g., schedules, assignments, exams, and extracurricular activities), decreased parental influence, and employment appear to play a significant role in the sleep patterns of adolescents. Physiological (circadian and homeostatic) processes that regulate sleep and wakefulness are also thought to influence the sleep habits of adolescents (Crabtree & Williams, 2009; Lee-Chiong, Jr., 2008). This shortened sleep time often results in excessive daytime sleepiness (EDS). As a result of EDS, adolescents may experience reduced performance in school, vulnerability to accidents, behaviour and mood problems, and increased use of alcohol or other substances (Crabtree & Williams, 2009; Gradisar et al., 2011).

Young Adults. Most young adults average 6 to 8.5 hours of sleep per night. Approximately 20% of sleep time is REM sleep, which remains consistent throughout life. The stresses of the job, family relationships, and social activities frequently lead to both insomnia and the use of medications to aid sleep. Daytime sleepiness contributes to an increased number of accidents, decreased productivity, and interpersonal problems in this age group. Pregnancy increases the need for sleep and rest. During the third trimester of pregnancy, women may experience insomnia, periodic limb movements, restless leg syndrome, and sleep disordered breathing (Balserak & Lee, 2011).

Middle Adults. During middle adulthood, the total time spent sleeping at night begins to decline. The amount of stage 4 sleep begins to fall and continues to fall with advancing age. Insomnia is particularly common, probably because of the

changes and stresses experienced in middle age. Anxiety, depression, and certain physical illnesses cause sleep disturbances. Women who have menopausal symptoms often experience insomnia (Lee & Moe, 2011).

Older Adults. Aging results in several physiological and psychological changes, and alterations in sleep patterns frequently occur because of these changes. Studies suggest that poor sleep quality is a common complaint of older adults. Approximately 50% of older adults report difficulty sleeping (Espiritu, 2008; Neikrug & Ancoli-Israel, 2010; Roepke & Ancoli-Israel, 2010). Aging is associated with changes in **sleep architecture**, or sleep pattern. Greater nighttime disturbances (increased awakenings at night), less slow-wave or deep sleep, increased frequency of daytime napping, and decreased total sleep time are changes in sleep architecture that occur with aging (Lee-Chiong, Jr., 2008).

Older women are at particular risk for sleep problems due to hormonal changes that accompany menopause. In fact, problems sleeping are reported by approximately 25% to 50% of menopausal women (Roepke & Ancoli-Israel, 2010). Hot flashes (episodes of warmth in the face and chest) occurring at night can cause problems sleeping and may lead to an increase in the frequency of nighttime awakenings and hence less sleep time.

Numerous factors are related to the sleep problems reported by older men and women. These include presence of co-morbid physiological conditions (e.g., heart disease) and psychological conditions (e.g., depression), primary sleep disorders (e.g., insomnia), chronic pain, nocturia, hormonal changes, use of multiple medications, and alterations in circadian rhythm expressions (Neikrug & Ancoli-Israel, 2010).

Factors Affecting Sleep

Often, several factors alter the quality and quantity of sleep, such as physiological, psychological, and environmental influences.

Drugs and Substances. Many older adults take a variety of medications to control or treat chronic conditions, and these medications can seriously disrupt sleep. Daytime sleepiness, insomnia, and fatigue often result as a direct effect of commonly prescribed medications (see Box 40-8). These medications may impair waking function and alter sleep patterns, which can be problematic for individuals (Cook, 2008a, 2008b; Smith et al., 2008). Antidepressants, antihistamines, and pain medications can cause daytime sleepiness or fatigue. Beta blockers have been associated with nightmares and vivid dreams. Diuretics can cause nocturia, thereby disrupting sleep. Medications prescribed for sleep can also be problematic as a result of their sedating effects during daytime hours (Mendelson, 2011).

Lifestyle. A person's daily routine influences sleep patterns. An individual working a rotating shift (e.g., two weeks of day shifts followed by a week of night shifts) often has difficulty adjusting to the altered sleep schedule (National Sleep Foundation, 2009b). For example, the body's internal clock for bedtime is set at 11 P.M., but the work schedule instead forces sleep at 9 A.M. The individual is able to sleep only three or four hours because the body's clock perceives that the morning is the time to be awake and active. Difficulties with maintaining alertness during work time result in decreased and even hazardous performance. After several weeks of working a night shift, a person's biological clock usually does adjust. Other alterations in routines that disrupt sleep patterns are

► BOX 40-8

Drugs and Their Effect on Sleep and Wakefulness

Hypnotics

- Decrease NREM stages 3 and 4 sleep as well as REM sleep
- Increase daytime sleepiness
- Lead to poor memory and concentration
- Depress respirations
- May worsen sleep apnea in older adults

Diuretics

- Nighttime awakenings caused by nocturia

Antidepressants

- Cognitive impairment
- Psychomotor impairment
- Increase of NREM stage 1 sleep
- Suppression of REM sleep
- Decrease in total sleep time
- Daytime sleepiness

Stimulants

Caffeine

- Prevents the onset of sleep
- Interrupts sleep during the night
- Decreases the time spent in deep sleep
- Interferes with REM sleep

Alcohol

- Speeds onset of sleep
- Reduces REM sleep
- Interrupts sleep during the night and makes returning to sleep difficult

Beta-Adrenergic Blockers

- Fatigue
- Insomnia
- Depression
- Psychomotor impairment
- Nightmares
- Vivid dreams

Benzodiazepines

- Alter REM sleep
- Increase sleep time
- Increase daytime sleepiness

Narcotics

- Cause somnolence
- Decrease amount of time spent in deep sleep stages
- Suppress REM sleep
- Depress respirations
- Cause cognitive impairment
- Cause psychomotor impairment

Anticonvulsants

- Decrease REM sleep time
- May cause daytime drowsiness
- May cause insomnia
- Cause impaired cognition

Anti-Parkinsonian Drugs

- May cause worsening of cognitive function, especially memory
- Cause fatigue
- Cause somnolence

performing unaccustomed heavy work, engaging in late-night social activities, and changing the evening mealtime (Balkin, 2011; Belenky & Akerstedt, 2011).

Usual Sleep Patterns. In the past century, the amount of sleep obtained nightly has decreased by more than 20% (National Sleep Foundation, 2010), which indicates that many adults are sleep deprived and experience excessive sleepiness during the day. Sleepiness becomes pathological when it occurs at times when individuals need to or want to be awake. Individuals who experience temporary sleep deprivation as a result of an active social evening or a lengthened work schedule usually feel sleepy the next day. However, they are usually able to overcome these feelings despite the difficulty they experience in performing tasks and remaining attentive. Much more serious than temporary sleep deprivation is chronic lack of sleep, which causes serious alterations in the ability to perform daily functions. Sleepiness tends to be most difficult to overcome during the performance of sedentary (inactive) tasks. For example, single-vehicle accidents related to a driver falling asleep at the wheel occur most often between 2 A.M. and 5 A.M., as a result of the sleepiness that occurs when individuals are awake during what is their normal period of sleep (Philip et al., 2011).

Emotional Stress. Sleep is frequently disrupted by worry over personal problems or a personal situation. **Emotional stress** causes a person to be tense and often leads to frustration when sleep does not occur. Stress also causes a person to try too hard to fall asleep, to awaken frequently during the sleep cycle, or to oversleep. Continued stress can lead to poor sleep habits.

Older patients frequently experience personal losses, such as retirement, physical impairment, or the death of a loved one, all of which can lead to emotional stress. Older adults and other individuals who live with depressive mood problems may experience delays in falling asleep, the earlier appearance of REM sleep, frequent awakening, increased total bed time, feelings of having slept poorly, and early awakening (National Sleep Foundation, 2009b).

Environment. The physical environment in which a person sleeps can significantly influence the ability to fall asleep and remain asleep. Good ventilation is essential for restful sleep. The size, firmness, and position of the bed also affect the quality of sleep. If a person usually sleeps with another individual, sleeping alone often causes wakefulness. On the other hand, sleeping with a restless or snoring bed partner can disrupt sleep.

In hospitals and other inpatient facilities, noise creates a problem for patients. Noise in hospitals is usually new or strange and often loud, and patients wake easily. While in hospital, the sleep of patients is often fragmented with patients experiencing increased total wake times, increased nocturnal awakenings, and decreased REM sleep and total sleep time. Environment-induced noises (e.g., nursing activities) are sources of increased sound levels. Intensive care units are sources for high noise levels as the result of staff consultations, monitor alarms, and equipment sounds (Elliott et al., 2011). The environment is unpleasant for sleeping because of the close proximity of patients, noise from confused and ill patients, the ringing of alarm systems and telephones, and disturbances caused by emergencies. Noise contributes to hearing loss, delays healing, impairs the immune function, and increases blood pressure, heart rate, and stress (Patel, Chipman, et al., 2008).

The level of light in a room affects the ability to fall asleep. Some patients prefer a dark room for sleep, whereas others, such as children or older adults, often prefer soft lighting during sleep. Patients may also have trouble sleeping because of the temperature of a room. A room that is too warm or too cold often causes a patient to become restless.

Exercise and Fatigue. A person who is moderately fatigued usually achieves restful sleep, especially when the fatigue is the result of enjoyable work or exercise. Exercising that is completed at least three hours prior to bedtime allows the body enough time to cool down and maintains a state of fatigue that promotes relaxation (National Sleep Foundation, 2009a). However, excess fatigue resulting from exhausting or stressful work makes falling asleep difficult. Excess fatigue is a common problem for grade-school children and adolescents.

Food and Caloric Intake. Following good eating habits is important for proper sleep. Eating a large, heavy meal or a spicy meal at night often leads to indigestion that interferes with sleep. Insomnia can result from caffeine, alcohol, or nicotine consumed in the evening. Coffee, tea, cola, and chocolate contain caffeine and xanthines that cause sleeplessness. Individuals who have insomnia can improve their sleep by drastically reducing or completely avoiding these substances (Reeve & Bailes, 2010). Some food allergies cause insomnia. In infants, a milk allergy sometimes causes nighttime waking and crying, or colic.

Both weight loss and weight gain influence sleep patterns (Patel, 2009; Van Cauter et al., 2008). Weight gain contributes to obstructive sleep apnea because of the increased size of the soft tissue structures in the upper airway (Wellman & White, 2011). Weight loss causes insomnia and decreased amounts of sleep (Patel, 2009). Certain sleep disorders are the result of the semistarvation diets popular in a weight-conscious society.

Critical Thinking

Successful critical thinking requires a synthesis of knowledge, including information gathered from patients, past experience, critical thinking qualities, and intellectual and professional standards. Clinical judgements require you to anticipate the required information, analyze the data, and make decisions regarding patient care. Adapting to the changing needs of your patient, based on sound decision making, constitutes critical thinking. During your assessment (Figure 40-3), consider all elements to make appropriate nursing diagnoses.

In the case of sleep, you will integrate knowledge from disciplines such as nursing, pharmacology, and psychology. Your experience with patients who have sleep problems, coupled with exploring research related to sleep, will aid in your understanding of effective forms of sleep therapies. You will need to use critical thinking qualities, such as perseverance, confidence, and discipline to complete a comprehensive assessment and to develop a plan of care that can successfully manage the sleep problem. The framework for practice developed by the Canadian Nurses Association (2007) and standards of practice developed by each provincial and territorial nursing organization identify your role as a nurse in patient care. In addition, evidence-informed geriatric nursing protocols for best practice such as those in *Excessive Sleepiness* (Chasens et al., 2008) provide specific instructions for assessing and addressing the needs of older patients with sleep disorders.

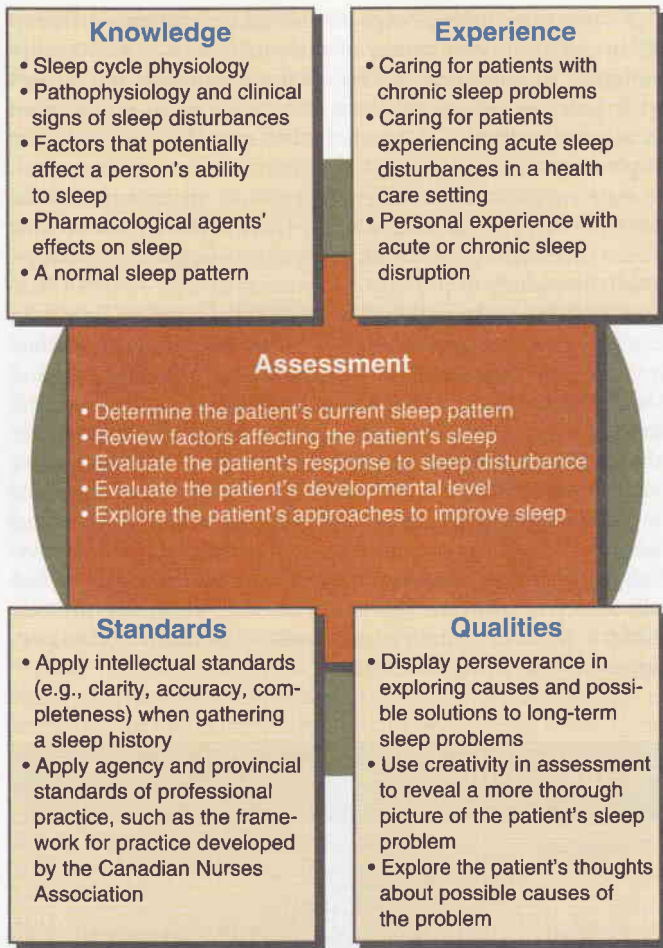


Figure 40-3 Critical thinking model for sleep assessment.

Nursing Process

◆ Assessment

Assess patients' sleep patterns by using the nursing history to gather information about factors that usually influence sleep. Because sleep is a subjective experience, only the patient is able to report whether it is sufficient and restful. If the patient is satisfied with the quantity and quality of sleep received, you will consider it normal, and the nursing history is brief. If, however, a patient reports or suspects a sleep problem, you need to conduct a detailed history.

Sleep Assessment

Most individuals are able to provide a reasonably accurate estimate of their sleep patterns, particularly if any changes have occurred. In your assessment, focus on understanding the characteristics of the patient's sleep problem and usual sleep habits so that your nursing care strategies to promote sleep are individualized. For example, if the nursing history reveals that a patient always reads before falling asleep, then offer reading material at bedtime.

Sources for Sleep Assessment. Usually, patients are the best resource for describing their sleep problems and how these problems differ from their usual sleep and waking patterns. The patient often knows the cause of sleep problems, such as a noisy environment or worry over a relationship. In

addition, bed partners are able to provide information on the patient's sleep patterns that help gain insight regarding the nature of certain sleep disorders. For example, partners of patients with sleep apnea often complain that the patient's snoring disturbs their sleep. Often the partners must sleep in a different bed or move to another room to obtain adequate sleep. Ask bed partners whether patients have pauses of breathing during sleep and how frequently these pauses occur. Some partners mention becoming fearful when patients stop breathing during sleep.

When caring for children, seek information about sleep patterns from the parents, who are usually a reliable source of information about their child's trouble with sleeping.

An infant's difficulty in falling asleep or frequent awakenings during the night are often the result of hunger, excessive warmth, or separation anxiety. Parents of infants need to keep a 24-hour diary of their infant's waking and sleeping behaviour for several days to aid in determining the cause of the problem. Ask the parents to describe the infant's eating pattern and sleeping environment, both of which can influence sleeping behaviour. Older children often are able to verbalize the fears or worries that inhibit their ability to fall asleep. If children frequently awaken in the middle of bad dreams, parents may be able to identify the problem, although they may not be able to understand the meanings of the dreams. Ask parents to describe the typical behaviour patterns that foster or impair sleep. For example, excessive stimulation from active play or from visiting friends will predictably impair sleep. In the case of a child who experiences chronic sleep problems, ask the parents to describe provoking factors, the duration of the problem, its progression, and the child's responses.

Tools for Sleep Assessment. Although subjective reports of sleep are reliable and valid measures of sleep, some people may be inclined to exaggerate or minimize their sleeping patterns. One effective, brief method for assessing sleep quality is the use of a visual analogue scale (Chervin, 2011; Cohen, 2004). Draw a straight horizontal line 100 mm long. At the opposite ends of the line, print two opposing statements, such as "best night's sleep" and "worst night's sleep." Ask patients to mark a point on the horizontal line that corresponds to their perception of the previous night's sleep. Measure the distance of the mark along the line in millimetres; this number is a numerical value for satisfaction with sleep. Use the scale repeatedly to show change over time. Such a scale is useful to assess an individual's changes in sleep pattern over time.

Another brief subjective method to assess sleep is a numeric scale with a 0 to 10 sleep rating (Cohen, 2004). Instruct patients to first rate their sleep quantity, then their quality of sleep on a scale of 1 to 10, with 0 being the worst sleep and 10 being the best sleep.

Sleep History

When a patient reports having received adequate sleep, a sleep history is usually brief. The information needed for you to plan care conducive to sleep includes the following: the usual bedtime, bedtime rituals, the preferred environment for sleeping, and the time the patient usually rises. When you suspect a sleep problem, explore the quality and characteristics of sleep in greater depth by asking patients to describe the nature of their sleep, including recent changes in their sleep pattern, sleep symptoms experienced during waking hours, use of sleep medications and other prescribed or over-the-counter

medications, herbal products, diet, intake of substances such as caffeine or alcohol that influence sleep, and recent life events that may have affected the patient's mental well-being.

Description of Sleeping Problems. When a patient reports a sleep problem, you need to conduct a more detailed history. A detailed assessment ensures that the appropriate therapeutic care is provided. Open-ended questions help a patient to describe the problem more fully. After the patient provides a general description of the problem, you can ask some focused questions, which will usually reveal specific characteristics that are useful in planning therapies. You need to understand the nature of the sleep problem, its signs and symptoms, its onset and duration, its severity, any predisposing factors or causes, and the overall effect on the patient. Ask specific questions related to the sleep problem (Box 40-9).

► BOX 40-9 Nursing Assessment Questions

Nature of the Problem

What type of problem are you having with your sleep?

Why do you think your sleep is inadequate?

Describe for me a recent typical night's sleep. How is this sleep different from what you are accustomed to?

Signs and Symptoms

Do you have difficulty falling asleep, staying asleep, or waking up?

Have you been told that you snore loudly?

Have you been told you stop breathing or gasp for breath during sleep?

Do you feel drowsy or fall asleep while reading, when watching television, while driving, or when participating in other daily activities?

Do you feel excessively sleepy or irritable? Do you have trouble concentrating during waking hours? Do you have headaches when awakening? Does your child awaken from nightmares?

Onset and Duration

When did you notice the problem?

How long has this problem lasted?

Severity

How long does it take you to fall asleep?

How often during the week do you have trouble falling asleep?

How many hours of sleep a night did you get this week?

How does this amount of sleep compare to what is usual for you?

What do you do when you awaken during the night or when you awaken too early in the morning?

Predisposing Factors

What do you do just before you go to bed?

Have you recently had any changes at work or at home?

Describe your mood. Have you noticed any changes in your mood recently?

What recreational drugs do you take on a regular basis?

Are you taking any new prescription or over-the-counter medications?

Do you eat food (spicy or greasy foods) or drink substances (alcohol or caffeinated beverages) that interfere with your sleep?

Do you have a physical illness that interferes with your sleep?

Does anyone in your family have a history of sleep problems?

Effect on the Patient

How has the loss of sleep affected you?

Proper questioning helps to determine the type of sleep disturbance and the nature of the problem. Box 40-10 gives examples of additional questions for you to ask the patient when you suspect specific sleep disorders. The questions assist in selecting specific sleep therapies and the best time for implementation.

As an adjunct to the sleep history, have the patient and the patient's bed partner keep a sleep-wake diary for one to four weeks (Lee-Chiong, Jr., 2008). The patient completes the sleep-wake diary daily to provide information on day-to-day variations in sleep-wake patterns over extended periods. Entries in the diary can include 24-hour information about various waking and sleeping health behaviours, including evening and bedtime routines, the time the patient goes to bed, the amount of time it took for the patient to fall asleep, the number of awakenings during the night, total sleep time, sleep quality (did they feel rested in the morning), the time and length of daytime napping, mealtimes, type and amount of alcohol and caffeine consumed, current medications, and daytime activities. A partner helps to record the estimated times the patient falls asleep or awakens. Although the sleep diary can provide useful information, the patient needs to be motivated to participate in recording the entries.

► BOX 40-10 Questions to Ask to Assess for Specific Sleep Disorders

Insomnia

Do you have difficulty falling asleep?

After you fall asleep, do you have difficulty staying asleep? How many times during a night's sleep do you awaken?

When you wake up in the morning, do you feel rested? What time do you wake up in the morning? What causes you to awaken early?

What do you do to prepare for sleep? What do you do to improve your sleep?

What do you think about as you try to fall asleep?

When did you notice you had problems sleeping?

How often do you have trouble sleeping?

Do you feel excessively tired or sleepy during the day?

Do you take naps during the daytime?

Do you have any problems with performing tasks (i.e., work-related or driving) during the daytime?

Sleep Apnea

Do you snore loudly? Does anyone else in your family snore loudly?

Has anyone (e.g., spouse, bed partner, roommate) ever told you that you stop breathing for short periods during your sleep?

Do you experience headaches after awakening?

Do you have difficulty staying awake during the day?

Narcolepsy

Do you sometimes fall asleep unexpectedly? (Friends or relatives may report any occurrences.)

Do you feel excessively tired or sleepy during the day?

Do you have trouble concentrating?

Have you ever had an episode of losing muscle control or falling to the floor after a laughing episode or when angry?

Have you ever had the feeling of being unable to move or talk just before falling asleep or upon awakening?

Do you have vivid dreams when going to sleep or waking up?

Usual Sleep Pattern. What constitutes “normal sleep” is difficult to define because individuals vary in their perception of the adequate quantity and quality of sleep. It is the responsibility of all health care providers to inquire about sleep quality of all patients. Patients need to describe their usual sleep pattern to determine the significance of the changes caused by a sleep disorder. Ask the following questions to determine a patient’s sleep pattern:

1. What time do you usually go to bed each night?
2. What time do you usually fall asleep? Do you do anything special to help you fall asleep?
3. How many times do you awaken during the night? Why?
4. What time do you typically wake in the morning?
5. What is the average number of hours you sleep each night?

Compare the patient data with the predominant sleep pattern for other patients of the same age. On the basis of this comparison, you can begin to assess for identifiable patterns, which may indicate a specific sleep disturbance, such as insomnia.

Patients with sleep problems frequently show patterns that differ drastically from their usual sleep pattern, or sometimes the change is relatively minor. Hospitalized patients usually need or want more sleep as a result of their illness; however, some patients require less sleep because they are less active. Some patients who are ill think that they need to try to sleep more than their usual amount of sleep, a perception that eventually makes sleeping difficult.

Physical and Psychological Illness. Determine whether the patient has any preexisting health problems that interfere with sleep. Poor sleep quality has been associated with numerous physiological and psychological illnesses. Chronic diseases, such as chronic obstructive pulmonary disease, and painful disorders, such as arthritis, interfere with sleep. This may occur because of the conditions themselves or because of medications taken to treat them. Several symptoms associated with these conditions, such as shortness of breath, pain, and nocturia, can potentially disrupt sleep. Psychiatric disorders can also interfere with sleep. For example, insomnia is common in individuals with schizophrenia, a chronic psychiatric disorder.

Insomnia is also common among individuals with depression. Anxiety disorders have also been associated with poor sleep (Ramsawh et al., 2011). Hence, it is very important to assess patients’ sleep pattern, medical and social history (e.g., alcohol, tobacco, and caffeine consumption), and medication usage, including a description of over-the-counter and prescribed drugs. The social history can provide useful information such as, for example, about a situational crisis that may be interfering with sleep. If a patient takes medications to aid sleep, gather information about the type and amount of medication that the patient uses. Assess the effectiveness of any medication and their effects on daytime function (Lee-Chiong, Jr., 2008).

Current Life Events. During your assessment, ask whether the patient is experiencing any changes in lifestyle that could disrupt sleep. A person’s occupation often offers a clue to the nature of the sleep problem (Drake & Wright, Jr., 2011). Changes in job responsibilities, rotating shifts, or long hours contribute to a sleep disturbance. You can question the patient about social activities, recent travel, or mealtime schedules to help clarify the sleep assessment.

Bedtime Routines. Ask patients what they do to prepare for sleep. For example, the patient may drink a glass of milk,

take a sleeping pill, eat a snack, or watch television. Note the habits that are beneficial compared with those that disturb sleep. For example, watching television may promote sleep for one person, whereas watching TV may stimulate another person to stay awake. Sometimes pointing out that a particular habit is interfering with sleep helps patients to find ways to change or eliminate that habit.

Pay special attention to a child’s bedtime rituals. Parents need to report whether it is necessary, for example, to read the child a bedtime story, rock the child to sleep, or engage in quiet play. Some young children need a special blanket or stuffed animal when going to sleep.

Bedroom Environment. During your assessment, ask the patient to describe their preferred bedroom conditions. These preferences may be the lighting in the room, music or television in the background, or the need to have the bedroom door open or closed. Some children require the company of a parent to fall asleep. In a health care environment, environmental distractions often interfere with sleep, such as a roommate’s television, an electronic monitor in the hallway, a noisy nurses’ station, or another patient who cries out at night. Identify strategies that you or the patient can use to reduce the effects of the distractions or to control the environment.

Behaviours of Sleep Deprivation. Some patients are unaware of how their sleep problems affect their behaviour. Observe the patient for behaviours such as irritability, forgetfulness, confusion, lethargy, frequent yawning, and slurred speech. If sleep deprivation has lasted a long time, psychotic behaviour, such as delusions and paranoia, sometimes develop. For example, a patient may report seeing strange objects or colours in the room, or the patient may act afraid when a nurse enters the room.

Patient Expectations

When a patient experiences a poor night’s sleep, a vicious cycle of anticipatory anxiety may begin. The patient may fear that sleep will again be disturbed and will try harder and harder to sleep (Morin, 2011). When assessing the patient’s sleep needs, use a skilled, individualized, and caring approach. Always ask patients what they expect regarding their sleep, the interventions they currently use, and the success of these interventions. Inquire about what other interventions they may prefer, and how they could be implemented. It is important to understand the patients’ expectations regarding their sleep pattern. When patients ask for assistance because of sleep disturbances, they typically expect a nurse to respond promptly to assist them in improving their quantity and quality of sleep.

❖Nursing Diagnosis

Review your assessment to identify clusters of data that characterize a sleep pattern disturbance. If you identify a sleep pattern disturbance, be specific, as numerous factors may be the cause of these disturbances. By specifying the nature of a sleep disturbance and related factors, you will be able to develop with the patient interventions particular to the patient’s situation. For example, interventions developed for sleep apnea will differ from those interventions developed to address sleep pattern disturbances related to psychological distress (e.g., anxiety, stress). Box 40-11 demonstrates how to use nursing assessment activities to identify and cluster defining characteristics to make an accurate nursing diagnosis related to sleep pattern disturbances.

► BOX 40-11 NURSING DIAGNOSTIC PROCESS

Insomnia

Assessment Activities

Ask the patient to describe his or her sleep pattern (past and present), the nature of the sleep problem, duration, etc.

Defining Characteristics

The patient reports either a history of or no history of sleep problems. The patient reports difficulty in falling asleep, staying asleep, and awakening several times during the night. Once awakened, the patient reports difficulty returning to sleep.

The patient reports the need to nap during the day due to daytime sleepiness.

With the use of a visual analogue scale, the patient reports feeling fatigued following a night's sleep.

The patient reports no regular bedtime routine and frequently remains in bed in the morning to "catch up" on the sleep lost the previous night.

Related Factors

Pathophysiological	The patient reports frequent awakenings during the night, for example, due to problems breathing.
Treatment	The patient reports daytime sleepiness due to medication.
Situational (personal, lifestyle)	The patient reports difficulty falling asleep and staying asleep because of a personal crisis. For example, the loss of a patient's job; the patient reports problems sleeping related to a recent diagnosis of cancer.
Observe the patient's appearance	The patient appears pale and has dark circles under the eyes.
Observe the patient's behaviour, and ask the patient's spouse whether the patient is experiencing behavioural changes.	The patient is irritable and yawns frequently. The patient reports not feeling well-rested and poor concentration. The spouse describes times when the patient was lethargic and distracted. The patient and the patient's spouse report napping during the day.
Determine whether the patient has experienced recent lifestyle changes.	The spouse reports the patient recently lost his or her job and is concerned about finding a new position. The patient reports being under tremendous stress because of a family member's illness.

Many factors can contribute to disturbed sleep patterns. It is important that your assessment identifies the probable cause of or factors related to the sleep disturbance, such as a noisy environment, a situational crisis, or a high intake of caffeinated beverages in the evening. These causes become the focus of interventions for minimizing or eliminating the problem. For example, if a patient is experiencing insomnia as the result of a noisy health care environment, use strategies to promote sleep, such as controlling the noise of hospital equipment, reducing interruptions, or keeping doors closed. If the insomnia is related to worry over a threatened marital separation, introduce coping strategies and collaborate with other health care providers regarding support groups or other services available to support the patient (Carpenito-Moyet, 2008; Lei et al., 2009). If you incorrectly identify the probable cause or related factors, the patient will not benefit from the strategies to minimize or eliminate the presumed sources of disruption.

Sleep problems affect patients in other ways. For example, you may find that a patient with sleep apnea is in conflict with a spouse who is tired of and frustrated over the patient's snoring. In addition, the spouse may be concerned that the patient is breathing improperly and thus is in danger. The nursing diagnosis of *compromised family coping* indicates that you need to provide support to both the patient and the patient's spouse so that they both understand sleep apnea and obtain the medical treatment needed. The following are examples of nursing diagnoses for patients with sleep problems:

- *Anxiety*
- *Ineffective breathing pattern*
- *Acute confusion*
- *Compromised family coping*
- *Ineffective coping*
- *Ineffective health maintenance*
- *Fatigue*
- *Ineffective protection*
- *Insomnia*
- *Disturbed sensory perception*
- *Sleep deprivation*

❖ Planning

Goals and Outcomes

During your planning of a strategy of care, you again synthesize information from multiple resources to develop an individualized plan of care (Figure 40-4 and Box 40-12). Ensure you consider standards of nursing practice and clinical practice guidelines when developing a plan of care. Clinical practice guidelines are evidence-informed recommendations developed by expert practitioners and arise from a synthesis of the best evidence of a particular topic (Morin, 2011).

As you plan care for the patient with sleep problems, you can create a concept map to help develop a holistic approach to patient-centred care (Figure 40-5). Create the concept map after identifying the relevant nursing diagnoses from the assessment database. In this example, the nursing diagnoses

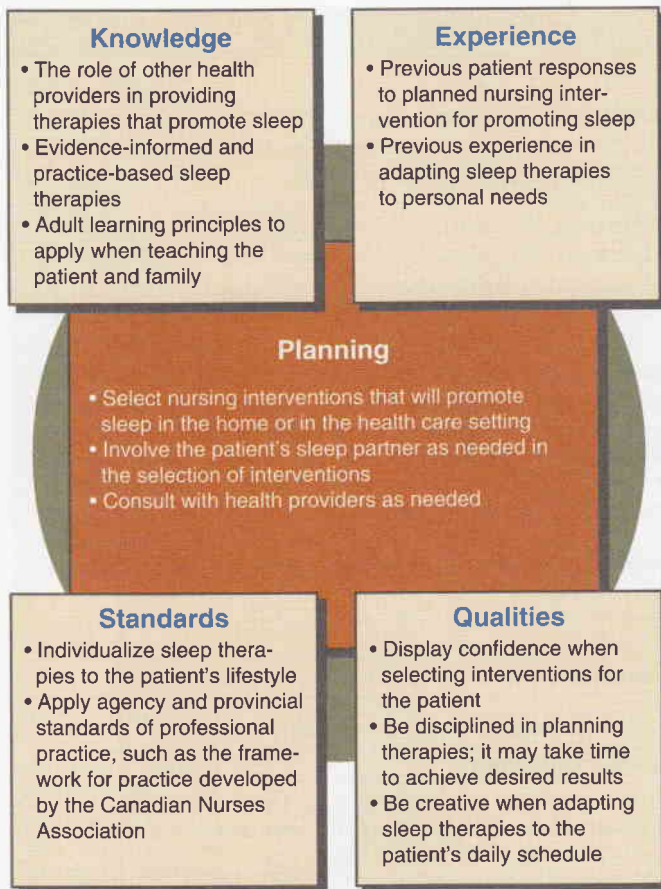


Figure 40-4 Critical thinking model for sleep planning.

are linked to the patient's anxiety related to her mother's recent cancer diagnosis.

The concept map shows the relationships between the nursing diagnoses *anxiety*, *disturbed sleep pattern*, and *impaired social interaction*. This approach to planning care can assist you in recognizing relationships between planned interventions. For this patient, interventions and successful outcomes for one nursing diagnosis affect the resolution of another nursing diagnosis.

When developing goals and outcomes, you and the patient need to collaborate. As a result, you will be more likely to set realistic goals and measurable outcomes. An effective plan includes outcomes that focus on the goal of improving the quantity and quality of sleep in the home over a realistic period of time. Family members are often very helpful in contributing to the plan. A sleep promotion plan frequently requires many weeks to accomplish. The following is an example of a goal with patient outcomes:

Goal: The patient will control the environmental sources that disrupt sleep within one month.

Outcomes:

- The patient will identify factors in the immediate home environment that disrupt sleep within two weeks.
- The patient will report having a discussion with family members about environmental barriers to sleep within two weeks.
- The patient will report changes made in the bedroom to promote sleep within four weeks.
- The patient will report having fewer than two awakenings per night within four weeks.

BOX 40-12 NURSING CARE PLAN

Disturbed Sleep Pattern

Assessment

Andree Smith is a 36-year-old lawyer who presents to the health care centre where you are working. Andree, accompanied by her husband, has come to the clinic because she is having problems sleeping. Andree is married and has three children, two in school and one in preschool. As you begin your assessment, Andree suddenly bursts into tears and tells you her mother has been recently diagnosed with breast cancer. Andree's assessment includes a thorough sleep history and a discussion on how this sleep problem is affecting her life. A physical examination is also conducted.

Assessment Activities

Sleep pattern (present and past)

Findings and Defining Characteristics*

Andree reports difficulty falling asleep at night and awakening several times during the night. Andree states, "I am so tired; I have no energy to do anything. I am irritable all of the time and I am having trouble concentrating at work."

Andree also reports that she has less patience with her children.

Relational Factors

Pathophysiological

Assess whether Andree has a history of and/or a family history of sleep problems.

Assess whether Andree has a history of medical or psychiatric disorders.

Andree reports no personal or family history of sleep problems.

Andree reports she has no history of any medical or psychiatric disorders.

Treatment

Assess Andree's use of medications (both over-the-counter and prescription), including names, dosage, and frequency.

Andree reports she recently started taking melatonin at bedtime to help her sleep. Aside from melatonin, Andree is on no other medication.

Continued

► BOX 40-12 NURSING CARE PLAN—cont'd

Situational (personal, home, community)

Ask Andree whether she has had any recent changes in her life.

Andree reports being highly anxious and states, *"Everything bothers me."* She also reports that she has *stopped* her routine of walking 2–4 km daily because she has no energy.

Situational (personal, lifestyle)

Ask Andree to describe her bedtime routine.

Andree reports she is going to bed between midnight and 1 A.M., which is two hours later than her usual bedtime. *It takes her an hour to fall asleep.* In the past, she received 7–8 hours of sleep each night, but now *it is closer to 5–6 hours.* She drinks two to three cups of coffee after dinner while surfing the Internet for information on her mother's condition. Andree also reports drinking a glass of wine before bedtime to help her relax because she has been having trouble falling asleep.

Observe Andree's appearance.

Assess Andree for signs of sleep problems.

Observe Andree's behaviour.

Andree appears *pale and tired.* She has *dark circles under her eyes* and is *slow to respond* to questions asked. She *yawns* frequently during the interview and appears restless.

With Andree's permission, ask her husband whether Andree has exhibited any behavioural changes.

Andree's husband reports she is *irritable* with the children, is *forgetful*, and cries easily.

*Defining characteristics are in italic type.

Nursing Diagnosis: Insomnia related to psychological stress from mother's recent cancer diagnosis.

Planning

Goals (Nursing Outcomes Classification)*

Sleep

Andree will achieve an improved sense of restorative sleep within two weeks.

Andree will report adherence to a regular bedtime routine within one week.

Expected Outcomes

Andree will report waking less during the night and feeling rested within two weeks.

Andree will achieve a more normal sleep pattern within two weeks. Within two weeks, Andree will report sleeping seven hours nightly.

Within two weeks, Andree will fall asleep within 30 minutes of going to bed.

*Outcomes from Carpenito-Moyet, L. J. (Ed). (2008). *Nursing diagnosis: Application to clinical practice* (12th ed). New York: Lippincott Williams & Wilkins.

Interventions (Nursing Interventions Classification)*

Sleep Enhancement

Encourage Andree to establish a bedtime routine and a regular sleep pattern.

Maintaining a consistent schedule helps induce sleep (Milner & Belicki, 2010).

Instruct Andree to limit her consumption of caffeine, nicotine, and alcohol before bedtime.

Caffeine and nicotine are stimulants and cause difficulty in falling asleep. Alcohol has the effect of lightening and fragmenting sleep (Milner & Belicki, 2010).

Assist Andree in identifying ways to eliminate stressful concerns about work before bedtime (e.g., taking time before actual sleep time to read a light novel).

Excess worry and intense activities before bedtime may stimulate the patient and prevent sleep (National Sleep Foundation, 2009a).

Adjust the sleep environment: have Andree control the noise, temperature, and light in the bedroom.

Develop an environment conducive to sleep (Morin et al., 2007).

Exercise Promotion

Encourage Andree to begin walking routinely during the day, but not two to three hours before bedtime.

Regular exercise increases activity levels and improves sleep quality. When exercise occurs just before bedtime, it can act as a stimulant that prevents sleep (National Sleep Foundation, 2009a).

Simple Relaxation Therapy

Instruct the patient on how to perform muscle relaxation before bedtime.

Relaxation therapy can help to reduce anxiety, which interferes with sleep (Lee-Chiong, Jr., 2008).

*Intervention classification labels from Carpenito-Moyet, L. J. (Ed). (2008). *Nursing diagnosis: Application to clinical practice* (12th ed). New York: Lippincott Williams & Wilkins.

BOX 40-12 NURSING CARE PLAN—cont'd

Evaluation

Nursing Actions

Ask Andree whether she is able to fall asleep and stay asleep.

Ask Andree to describe her waking behaviours at work and home during the day.

Observe Andree's waking nonverbal expressions and behaviour.

Patient Response and Finding

Andree responds, "It usually takes me 15 to 20 minutes to fall asleep, and I woke up once at night twice last week."

Andree responds that she is able to concentrate on her work more. She reports she is less irritable with her children. She has restarted her walking routine.

Andree sits in the chair without shifting position. She actively engages in conversation with you. She does not yawn during the interview. She is not as pale as she was previously and the circles under her eyes are almost gone.

Achievement of Outcome

Andree reports she falls asleep within 30 minutes and wakes up less frequently during the night.

Andree reports feeling more rested.

Andree says she sleeps for an average of seven hours a night.

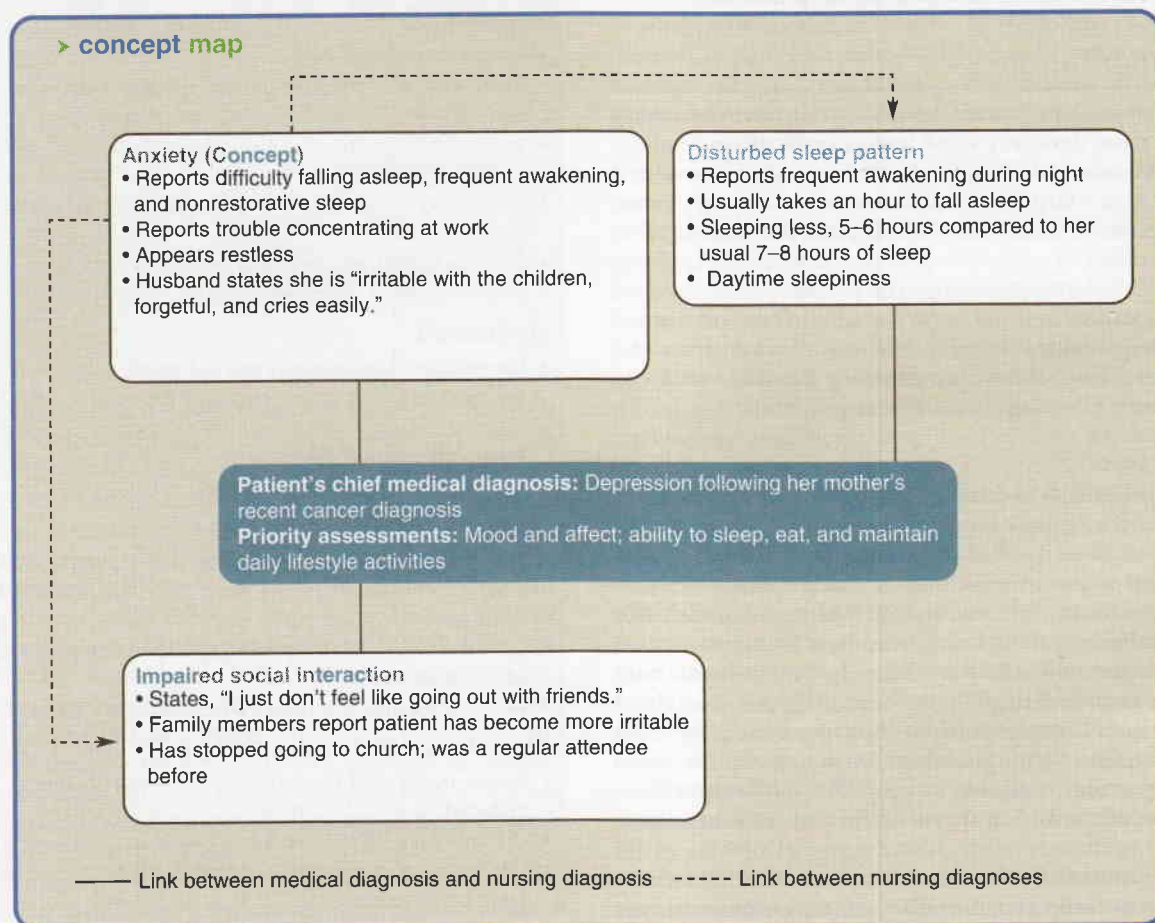


Figure 40-5 Concept map for a patient who has depression following the news of her mother's recent cancer diagnosis.

Setting Priorities

Collaborate with the patient to establish the priority outcomes and interventions. Remember, sleep problems are frequently the result of other health problems, and management of these problems and their associated symptoms is your first priority. Once the symptoms are properly managed, you can then focus on sleep therapies.

Collaborative Care

In collaboration with the patient and the patient's significant others, ensure that any planned interventions, such as a change in the sleep schedule or changes to the bedroom environment, are realistic and achievable. In a health care setting, plan the treatments or routines so that the patient is able to rest. For example, in the intensive care unit, use available electronic

monitors to track trends in vital signs without awakening the patient each hour. Other staff members need to be aware of the plan of care so they can cluster activities at certain times to reduce the number of awakenings. In a nursing home, the focus of the plan involves better planning of rest periods around the activities of the other residents. Often, patients' roommates have very different schedules and this must be considered.

The nature of the sleep disturbance determines whether referrals are necessary to additional health care providers. For example, if a sleep problem is related to a situational crisis or an emotional problem, you may refer the patient to a psychiatric clinical nurse specialist or a clinical psychologist for counselling. When a patient has chronic insomnia, a referral to a sleep centre is beneficial. If the patient needs a referral for continued care in the community, you should offer information about the sleep problem to the home care nurse. The success of sleep therapy depends on an approach that fits both the patient's lifestyle and the nature of the sleep disorder.

❖ Implementation

Nursing interventions that are designed to improve the quality of a person's rest and sleep focus largely on health promotion. Patients need adequate sleep and rest to maintain active and productive lives. During times of illness, rest and sleep promotion are important for recovery. Nursing care provided in acute care, restorative care, or continuing care settings differs from nursing care in the home setting. The primary differences are in the environment and the nurse's ability to support normal rest and sleep habits. The patient's age also influences the types of therapies that are most effective. Box 40-13 provides principles for promoting sleep in older patients.

Health Promotion

You can help patients in community health and home settings to develop behaviours conducive to rest and relaxation. To develop good sleep habits at home, patients and their bed partners need to learn the techniques that promote sleep and the conditions that interfere with sleep (Milner & Belicki, 2010) (Box 40-14). Parents should also learn how to promote good sleep habits for their children. Patients benefit most from instructions that are formed on the basis of information about their homes and lifestyles, such as the types of activities that promote sleep for a shift worker or ways to make the home environment more conducive to sleep. Patients will be more likely to apply information that is useful and relevant to their needs.

Environmental Controls. All patients require a sleeping environment with a comfortable room temperature, proper ventilation, minimal noise, a comfortable bed, and proper lighting (Morin, 2011). Children and adults vary in their preferences for a comfortable room temperature. Instruct parents to position cribs away from open windows or drafts and to cover the infant with a light, warm blanket. Older adults often require extra blankets or covers.

Eliminate distracting noise so that the bedroom is as quiet as possible. In the home, the television, telephone, or the intermittent chiming of a clock can disrupt a patient's sleep. The family becomes an important part of the approach to reduce noise in the home, especially if the home is shared with several family members, all with different bedtime schedules. Remember, however, that some patients are accustomed to sleeping

* BOX 40-13 FOCUS ON OLDER ADULTS

Promoting Sleep

Sleep-Wake Pattern

- Maintain a regular bedtime and wake-up schedule, even on weekends or vacations (Lee-Chiong, Jr., 2008).
- Eliminate naps unless they are a routine part of the schedule.
- If naps are used, limit them to 20 minutes or less, twice a day and avoid napping in the late afternoon or early evening.
- Go to bed when sleepy.
- Use a warm bath and relaxation techniques (reading, music, meditation, guided visual imagery) to promote sleep (Lee-Chiong, Jr., 2008).
- If unable to sleep within 15 to 30 minutes, get out of bed.
- Avoid work-related activities prior to bedtime (Milner & Belicki, 2010).



Environment

- Sleep where you sleep best.
- Keep noise to a minimum; use soft music to mask noise if necessary.
- Use a night light and keep the path to the bathroom free of obstacles.
- Set the room temperature to your preference; use socks to promote warmth.
- For "clock watchers" remove the clock from the bedroom.
- Listen to relaxing music (Morin, 2011).

Medications

- Use sedatives and hypnotics as a last resort, and then only for the short term if absolutely necessary (Mendelson, 2011).
- Adjust medications being taken for other conditions, and assess for drug interactions that may cause insomnia or excessive daytime sleepiness (EDS).

Diet

- Limit the intake of alcohol, caffeine, and nicotine in the late afternoon and evening (Lee-Chiong, Jr., 2008; Milner & Belicki, 2010).
- Consume carbohydrates or milk as a light snack before bedtime (Milner & Belicki, 2010).
- Decrease the intake of fluids two to four hours before sleep.

Physiological and Illness Factors

- Elevate the head of the bed and provide extra pillows as preferred.
- Use analgesics 30 minutes before bed to ease aches and pains.
- Use therapeutics to control symptoms of chronic conditions as prescribed (Lavigne et al., 2011).

with familiar inside noises, such as the hum of a fan. Commercial products that play soothing sounds, such as recordings of ocean waves or rainfall, can help to create a soothing environment for sleep.

The bed and mattress need to provide support and comfortable firmness. Bed boards can be placed under mattresses to provide additional support. Sometimes extra pillows can help to position a person comfortably in bed. For some patients, the position of the bed in the room also makes a difference.

Patients vary in their preference for the amount of light they can tolerate in the bedroom. Infants and older adults sleep best

► BOX 40-14 Sleep Hygiene Habits

Objective

- Patient will follow proper sleep hygiene habits at home.

Teaching Strategies

- Instruct the patient to try to exercise daily, preferably in the morning or afternoon, and to avoid vigorous exercise within two hours of bedtime.
- Caution the patient against sleeping long hours during weekends or holidays to prevent disturbance of the normal sleep–wake cycle.
- Explain that the patient should not use the bedroom for intensive studying, snacking, TV watching, or other nonsleep activity, besides sex.
- Encourage the patient to try to avoid worrisome thinking when going to bed and to practise relaxation exercises.
- If the patient does not fall asleep within 30 minutes of going to bed, advise the patient to get out of bed and do some quiet activity until the patient feels sleepy enough to go back to bed.
- Advise the patient to limit consumption of caffeine and alcohol.
- Ask the patient to examine the sleeping environment. If noise or light is an issue, suggest the use of earplugs or eyeshades.
- Instruct the patient to avoid heavy meals for three hours before bedtime; the patient may have a light snack before bedtime.

Evaluation

- Ask the patient to complete a sleep–wake and activity diary for one week, and compare it with the previous week's diary.
- Ask the patient to periodically complete a visual analogue or sleep rating scale to record perceptions of quality of sleep.

in softly lit rooms. Light should not shine directly on their eyes. Small table lamps can be used to prevent total darkness. For older adults, proper lighting reduces the chance of confusion and prevents falls while walking to the bathroom. Heavy shades, drapes, or slatted blinds are helpful if streetlights shine through windows, or if patients nap during the day.

Promoting Bedtime Routines. Bedtime routines help to relax patients in preparation for sleep (Milner & Belicki, 2010). Individuals should go to bed when they feel fatigued or sleepy. Going to bed while fully awake and thinking about other things often leads to insomnia and interferes with the perception of the bed as a stimulus for sleep. Newborns and infants sleep through so much of the day that a specific routine is hardly necessary. However, quiet activities, such as holding them snugly in blankets, singing or talking softly, and gentle rocking, help infants to fall asleep.

Parents need to reinforce short, predictable routines associated with preparing for bedtime (Milner & Belicki, 2010). A bedtime routine that is used consistently (e.g., the same hour for bedtime, eating a snack, or pursuing a quiet activity) helps young children to avoid delaying sleep. Bedtime routines can include quiet activities such as reading stories, colouring, allowing children to sit in a parent's lap while listening to music, or listening to a prayer.

Adults need to avoid excessive mental stimulation just before bedtime. Reading a light novel, watching an enjoyable television program, or listening to music can help a person to relax. Relaxation exercises, such as slow, deep breathing for one or two minutes, can help to relieve tension and prepare the body for rest (see Chapter 35). Guided imagery and praying also promote sleep for some patients.

At home, discourage patients from trying to finish office work or to resolve family problems before bedtime. The bedroom is not a place to work, and patients need to always associate the bedroom with sleep. Working toward a consistent time for sleeping and waking helps most patients to gain a healthy sleep pattern and to strengthen the rhythm of their sleep–wake cycle.

Promoting Safety. For any patient prone to confusion or falls, safety is critical. A small night light can assist the patient in orienting to the room environment before going to the bathroom. Beds set lower to the floor reduce the chance of a person falling when first standing. Instruct patients to remove clutter and small rugs from the path used to walk from the bed to the bathroom. If a patient needs assistance in ambulating from a bed to the bathroom, place a small bell at the bedside to call family members. Sleepwalkers are unaware of their surroundings and are slow to react, which increases their risk of falls. Do not startle sleepwalkers but instead gently awaken them and lead them back to bed.

Infants' beds need to be safe. To reduce the chance of suffocation, do not place pillows, stuffed toys, or the ends of loose blankets in cribs. Loose-fitting plastic mattress covers are dangerous because infants can pull them over their face and suffocate. Parents should place infants on their back to prevent sudden infant death syndrome (SIDS) (National Sleep Foundation, 2009a).

Promoting Comfort. People fall asleep only after feeling comfortable and relaxed (Carpenito-Moyet, 2008). Minor irritants often keep patients awake. Soft cotton nightclothes keep infants or small children warm and comfortable. Instruct patients to wear loose-fitting nightwear. An extra blanket is sometimes all that is necessary to prevent a person from feeling chilled and thus being unable to fall asleep. Patients need to void before retiring so they are not kept awake by a full bladder.

Establishing Periods of Rest and Sleep. Encourage patients living at home to stay physically active during the day so that they will be more likely to sleep at night. Increasing daytime activity reduces the likelihood of having problems with falling asleep. In the home setting, nurses frequently care for patients with chronic debilitating disease. The nursing care plan includes having patients set aside afternoons for rest to promote optimal health. To provide uninterrupted rest periods, adjust patients' medication schedules, instruct patients to void before rest periods, and suggest unplugging the telephone.

Stress Reduction. The inability to sleep because of emotional stress can make a person feel irritable and tense. When patients feel emotionally upset, encourage them not to force sleep. Otherwise, insomnia can develop, and bedtime is soon associated with the inability to relax. Encourage a patient who has difficulty falling asleep to get up and pursue a relaxing activity, such as reading, rather than staying in bed and thinking about sleep.

Preschoolers have bedtime fears (e.g., fear of the dark or fear of strange noises) and frequently awaken during the night or have nightmares. When a child experiences a nightmare, the parent should enter the child's room immediately and talk to the child briefly about fears to provide a cooling-down period. One approach is to comfort children and leave them in their own beds so that their fears are not used as an excuse to delay bedtime. Keeping a light turned on in the room will also help some children. Cultural tradition causes families to approach sleep practices differently (Box 40-15).

* BOX 40-15 CULTURAL ASPECTS OF CARE

Practices and patterns of sleep and rest vary among cultures. Culture and biology influence the development of sleep problems in children. Sleep patterns, bedtime routines, sleep aids, and sleep arrangements are a component of the cultural practices related to the use of space and the perception of comfortable distances for interactions with others. Sleep experts traditionally recommend having infants and children sleep in their own beds. Co-sleeping (i.e., the practice of infants and children sleeping with their parents) is a culturally preferred habit and is common in nonindustrialized countries. Health care providers in Canada frequently discourage this practice because of safety issues. The Canadian culture promotes independence in childhood. Because co-sleeping does not promote this independence, health care workers discourage it. As a nurse, you need to be culturally sensitive when discussing co-sleeping practices with parents and developing sleeping plans for children.



Implications for Practice

- Complete a thorough sleep assessment of the child and the family.
- Discuss the risks of the child sleeping with the parents. During the discussion, remain culturally sensitive and respectful of the parents' views.
- Co-sleeping affects the infant's normal sleep pattern by decreasing slow-wave sleep and increasing the number of nighttime arousals.
- Co-sleeping has been linked to an increased risk of sudden infant death syndrome (SIDS) under certain conditions, such as parental smoking and alcohol or drug use.
- Instruct parents who practise co-sleeping to avoid using alcohol or drugs that impair arousal. Decreased arousal prevents the parents from awakening if the child experiences problems.
- Co-sleeping should occur only with parents and not with another adult or child.
- Encourage the parents who co-sleep to use light sleeping clothes, to keep the room temperature comfortable, and to not bundle the child tightly or in too many clothes.

Bedtime Snacks. Some individuals enjoy bedtime snacks, whereas others cannot sleep after eating. A dairy product snack, such as warm milk or cocoa, contains L-tryptophan and is often helpful in promoting sleep. A full meal before bedtime often causes gastrointestinal upset and can interfere with the ability to fall asleep.

Encourage patients to avoid drinking or ingesting caffeine before bedtime. Because coffee, tea, cola, and chocolate act as stimulants, they can cause a person to stay awake or to awaken throughout the night (National Sleep Foundation, 2009a). Infants require special measures to minimize their nighttime awakenings for feeding. Children commonly need a middle-of-the-night bottle or to breastfeed at night. Hockenberry and Wilson (2007) recommend offering the last feeding as late as possible. Instruct parents not to give infants bottles in bed.

Pharmacological Approaches. Melatonin is a major hormone of the circadian system and plays an important role in promoting sleep (Buysse, 2011). Melatonin is a popular nutritional supplement to aid sleep. The recommended dosage is 0.3 to 1 mg taken two hours before bedtime (National Sleep Foundation, 2009b). Older adults who have decreased levels

of melatonin find taking melatonin to be beneficial as a sleep aid (Lee-Chiong, Jr., 2008). Several other herbal products also assist in promoting sleep. Valerian is effective in mild insomnia. It effects the release of neurotransmitters and produces a very mild sedation (Buysse, 2011). Kava helps promote sleep in patients who have sleep problems related to anxiety but needs to be used cautiously because of its potential toxic effects on the liver (Morin, 2011). Chamomile, passion flower, lemon balm, and lavender are other herbal products that have mild sedative effects. Caution patients about the dosage and use of herbal compounds. Because some herbal compounds interact with prescribed medication, patients should avoid using these treatments together (Krystal, 2011) (see Chapter 34).

The use of nonprescription sleeping medications is not advisable. Patients need to learn the risks of such drugs. Although these drugs initially seem to be effective, over the long term, they can lead to further sleep disruption. Help patients to use behavioural and proper sleep hygiene habits to establish sleep patterns that do not require the use of drugs.

Acute Care

Patients in an acute care setting frequently have their normal rest and sleep routines disrupted, which makes them more susceptible to periods of sleep deprivation. Sleep has a restorative function, hence, in this setting, nursing interventions should focus on controlling factors in the environment that disrupt sleep, relieving physiological or psychological barriers to sleep, and providing uninterrupted rest and sleep periods for the patient. The nurse may accomplish this by organizing procedures to minimize the number of times the patient's sleep must be disrupted and by avoiding any unnecessary procedures during rest periods.

Environmental Controls. In a hospital setting, nurses can promote rest and sleep periods by reducing or eliminating environmental disturbances. When possible, the doors to patients' rooms should be closed. In semiprivate rooms, the curtains should be closed between patients. At night, the lights on a nursing unit should be dimmed. Noise levels can be reduced by conducting conversations and reports away from patient rooms and by keeping necessary conversations to a minimum, especially at night; reducing the volume of alarms, televisions, and other equipment; turning off bedside oxygen and other equipment not in use and, when possible, avoiding noisy procedures till daytime hours (Carpenito-Moyet, 2008). Patients' use of cellular telephones and laptop computers should be discouraged during rest periods, and their minimal use during the hospitalization period should be encouraged. Moreover, the nurse should limit visitors during rest periods.

Promoting Comfort. Compared with beds at home, hospital beds are often harder and of a different height, length, or width. Keeping beds clean and dry and in a comfortable position helps patients to relax. Use pillows for support (painful limbs, splinting of surgical incisions). Some patients who have painful illnesses require special comfort measures, such as the application of dry or moist heat, use of supportive dressings or splints, or proper positioning before retiring (Figure 40-6).

Establishing Periods of Rest and Sleep. In a hospital or long-term care setting, it is sometimes difficult to provide patients with the time needed to rest and sleep. However, you should plan your nursing care to avoid awakening patients for nonessential tasks. When possible, schedule assessments, treatments, procedures, and routines for times when patients

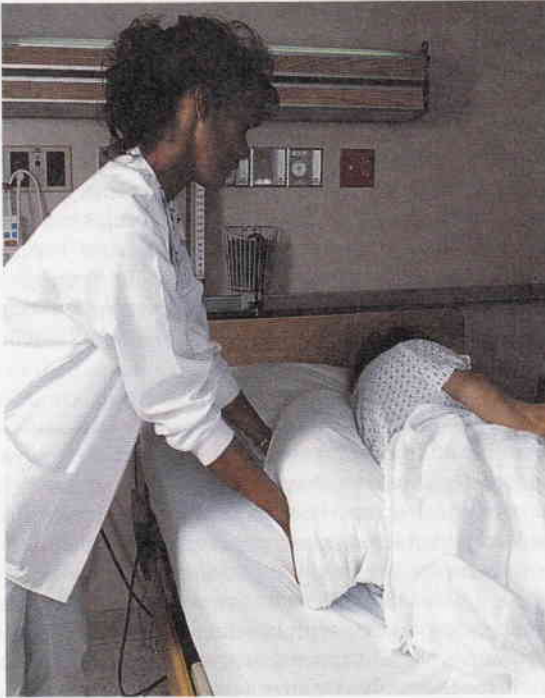


Figure 40-6 Positioning a patient for sleep.

are awake. For example, if a patient's physical condition has been stable, avoid awakening the patient to check vital signs. Allowing patients to determine the timing and methods of delivery of personal care measures will promote rest. Do not choose to give baths and routine hygiene measures during the night because that timing may be most convenient for the nursing staff. Draw blood samples at a time when the patient is awake. Unless maintaining a drug's therapeutic blood level is essential, give medications during waking hours. Work with the radiology department and other support services to schedule diagnostic studies and therapies at intervals that allow patients time for rest. Always try to provide the patient with two to three hours of uninterrupted sleep during the night (Cmiel et al., 2004). The nurse may accomplish this by organizing procedures to minimize the number of times the patient's sleep must be disrupted and by avoiding any unnecessary procedures during rest periods.

When the patient's condition demands more frequent monitoring, schedule activities to allow the patient to have extended rest periods. Plan activities to ensure both that health care personnel will avoid returning to the room every few minutes and that the patient will have up to an hour or more to rest quietly. For example, if a patient needs frequent dressing changes, is receiving intravenous therapy, and has drainage tubes from several sites, do not make a separate trip into the room to attend to each task. Instead use a single visit to change the dressing, regulate the intravenous system, and empty the drainage tubes. Become the patient's advocate for promoting optimal sleep by postponing or rescheduling visits by family, asking consultants to reschedule visits, or questioning the frequency of certain procedures.

Promoting Safety. Patients with obstructive sleep apnea are at risk for complications while in the hospital. Surgery and anaesthesia disrupt the patients' normal sleep patterns. Postoperatively, these patients reach deep levels of

REM sleep. This deep sleep causes muscle relaxation that can lead to obstructive sleep apnea (Cao et al., 2011). Patients with OSA who are given opioid analgesics after surgery have an increased risk of developing airway obstruction because these medications suppress the normal arousal mechanisms (Cao et al., 2011). Monitor the patient's airway, respiratory rate, depth, and breath sounds frequently after surgery.

Recommend lifestyle changes to patients with OSA, including sleep hygiene improvements, alcohol moderation, smoking cessation, and a weight-loss program (Atwood, Jr., et al., 2011). Teach the patient to prevent sleeping in the supine position by wearing a fanny pack or tight shirt with a tennis ball on the back or by elevating the head of the bed 30 to 45 degrees (Atwood, Jr., et al., 2011). One of the most effective therapies is use of a nasal continuous positive airway pressure (CPAP) device at night, which requires a patient to wear a mask over the nose. The mask delivers room air at a high pressure and the air pressure prevents airway collapse. The CPAP device is portable and is effective particularly for obstructive sleep apnea (Buchanan & Grunstein, 2011).

Another treatment option is the use of an oral appliance. These appliances advance the mandible or tongue to relieve pharyngeal obstruction (Cistulli et al., 2011). In cases of severe sleep apnea, the tonsils, uvula, or portions of the soft palate are surgically removed. Success with surgical procedures is variable.

Stress Reduction. Patients who are hospitalized for extensive diagnostic testing often have difficulty resting or sleeping because of uncertainty about their state of health. Giving patients control over their health care minimizes uncertainty and anxiety. Providing information about the purpose of procedures and routines, and answering questions, will give patients the peace of mind they need to rest or to fall asleep. During the night shift, take time to sit and talk with patients who are unable to sleep. You may be able to determine the factors preventing patients from sleeping. Back rubs also help patients relax more thoroughly. If a sedative is indicated, confer with the physician to ensure the lowest dosage is used initially. Discontinue a sedative as soon as possible to prevent a dependence that can seriously disrupt the normal sleep cycle. Be aware that the metabolism of drugs in older adults is slower, making them more vulnerable to the side effects of sedatives, hypnotics, anti-anxiety drugs, and analgesics.

Restorative or Continuing Care

Nursing interventions implemented in the acute care setting are also used in the restorative or continuing care environment. Important considerations include controlling the environment, especially the noise level; establishing periods of rest and sleep; and promoting comfort. Nursing interventions related to the control of barriers to sleep are also implemented in these settings. Helping a patient achieve restful sleep in this environment sometimes takes a period of time.

Promoting Comfort. Comfort measures promote sleep and improve patients' sense of well-being. Nurses can promote comfort by offering a patient a warm bath or shower before bedtime. Other personal hygiene measures are mouth care and toileting (e.g., offering the bedpan or urinal). Back massages, soft music, and relaxation exercises also promote comfort. Proper positioning of the patient in bed is also very important. Using pillows to support limbs and other dependent body parts maintains skin integrity, thereby maintaining comfort (Milner & Belicki, 2010) (see Chapter 41).

Controlling Physiological Disturbances. Controlling the symptoms of patients with physical illnesses can promote sleep. For example, placing patients with respiratory disorders in upright bed positions and offering additional pillows may assist with their breathing. Teaching patients with chronic respiratory disorders (e.g., chronic obstructive pulmonary disease) pursed-lip breathing will decrease their respiratory rate and also promote comfort and sleep. Humidified air, the use of supplemental oxygen, if appropriate, and other pharmacological therapies (i.e., bronchodilators) are also relevant considerations.

Patients with pain, nausea, and other recurrent symptoms may require nonpharmacological and pharmacological therapies to promote sleep (Milner & Belicki, 2010; Morin, 2011). Relaxation measures (e.g., music, guided imagery) are appropriate diversional therapies. Providing pain relief with analgesics is also appropriate. To promote comfort and sleep, collaborate with physicians and other health care personnel to determine the optimal plan for relief of patients' symptoms (Milner & Belicki, 2011).

Pharmacological Approaches. Numerous pharmacological agents, both prescription and over-the-counter, are used to manage insomnia. Conversely, polypharmacy to manage insomnia is associated with disrupted sleep patterns, including increased nocturnal awakening and decreased REM sleep and total sleep time. Therefore, central nervous system (CNS) stimulants, such as amphetamines, caffeine, nicotine, terbutaline, theophylline, and pemoline, need to be used sparingly and only under medical management (O'Malley et al., 2011). In addition, withdrawal from CNS depressants, such as alcohol, barbiturates, tricyclic antidepressants (amitriptyline, imipramine, and doxepin), and triazolam can cause insomnia. You will need to manage these medications carefully.

Medications that induce sleep are called **hypnotics**. **Sedatives** are medications that produce a calming or soothing effect (Mendelson, 2011). Hypnotics and sedatives can be used as sleep medications and will help, if used correctly. A patient who takes sleep medications needs to understand their proper use, their risks, and their possible side effects. Long-term use of anti-anxiety, sedative, or hypnotic agents, however, can disrupt sleep and lead to more serious problems.

One group of drugs considered to be relatively safe is the benzodiazepines. The benzodiazepines cause relaxation, anti-anxiety, and hypnotic effects by facilitating the action of neurons in the CNS that suppress responsiveness to stimulation, thereby decreasing the levels of arousal (Mendelson, 2011). Unlike sedatives and hypnotics, benzodiazepines do not cause general CNS depression, and they also have a lower potential for abuse. These drugs are frequently prescribed because anti-anxiety effects occur at safe, nontoxic doses. In the older adult, short-acting benzodiazepines, such as temazepam and triazolam, are preferred over long-acting agents (Mendelson, 2011).

Administer benzodiazepines cautiously with children younger than 12 years of age. These medications are contraindicated in infants younger than six months. Pregnant women need to avoid benzodiazepines because their use is associated with the risk of congenital anomalies. Nursing mothers do not receive these drugs because they are excreted in breast milk. Initial doses are small, and increments are added gradually, on the basis of patient response, for a limited period of time. Warn patients not to take more than the prescribed dose, especially if the medication seems to become less effective after the initial

use. If older patients who were continent, ambulatory, and alert suddenly become incontinent, confused, or demonstrate impaired mobility, the use of benzodiazepines needs to be considered as a possible cause. Regular use of any sleep medication often leads to drug tolerance. Rebound insomnia is a problem that can be experienced after stopping the medication (Lee-Chiong, Jr., 2008). Immediately administering a sleeping medication when a hospitalized patient complains of being unable to sleep will do the patient more harm than good. Consider alternative approaches to promote sleep. Routine monitoring of the patient's response to sleeping medications is also important.

❖Evaluation

The patient is an important source of information for evaluating outcomes related to sleep and rest. Each patient has a unique need for sleep and rest, and only the patient will know whether sleep problems have improved, and which interventions or therapies are most successful in promoting sleep (Figure 40-7). To evaluate the effectiveness of nursing interventions, make comparisons with baseline sleep assessment data.

Determine whether expected outcomes have been met. Use evaluative measures shortly after a therapy has been tried (e.g., by observing whether a patient falls asleep after noise has been reduced and the room has been darkened). Use other evaluative measures after a patient awakens from sleep (e.g., by

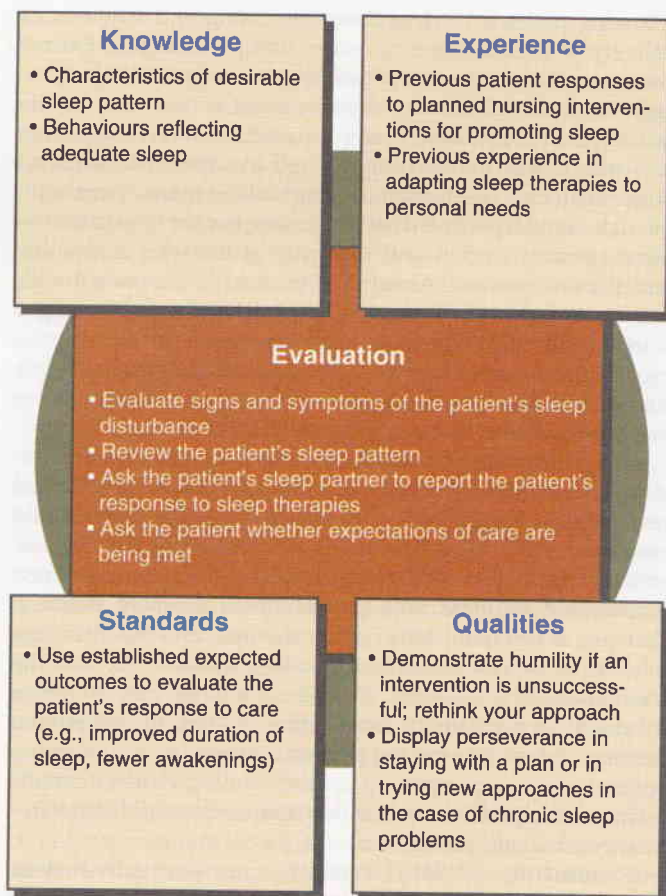


Figure 40-7 Critical thinking model for sleep evaluation.

asking a patient to describe the number of awakenings during the previous night). The patient and the patient's bed partner can usually provide accurate evaluative information. Over longer periods, use assessment tools, such as the visual analogue scale or the sleep rating scale, to determine whether sleep has progressively improved.

You also need to evaluate the level of understanding that patients and their family members have gained after receiving instruction in sleep habits. You can measure compliance with these practices during a home visit, when you are able to observe the environment. When expected outcomes are not met, revise the nursing measures or expected outcomes, on the basis of the patient's needs or preferences. When outcomes are not met, ask questions such as "Do you feel as though you slept better when you exercised?" or "Do you feel rested when you wake up?"

When nurses successfully develop good relationships with patients and when they have developed therapeutic plans of care, subtle behaviours often indicate the patients' levels of satisfaction. Note the absence of signs of sleep problems, such as lethargy, frequent yawning, or position changes. Ask the patient whether his or her sleep needs have been met. For example, ask the patient, "Are you feeling more rested?" or "Can you tell me if you feel we have done all we can to help improve your sleep?" If the patient's expectations have not been met, you will need to spend more time trying to understand the patient's needs and preferences. Working closely with the patient and the patient's bed partner will enable you to redefine the expectations that can be realistically met within the limits of the patient's condition and treatment.

✦ KEY CONCEPTS

- Sleep provides physiological and psychological restoration.
- The 24-hour sleep-wake cycle is a circadian rhythm that influences physiological function and behaviour.
- The control and regulation of sleep depends on a balance between regulators within the central nervous system.
- During a typical night's sleep, a person passes through four to five complete sleep cycles. Each sleep cycle contains four nonrapid eye movement (NREM) stages of sleep and a period of rapid eye movement (REM) sleep.
- The most common type of sleep disorder is insomnia.
- The sleep pattern is frequently disrupted by the hectic pace of a person's lifestyle, emotional and psychological stress, and alcohol ingestion.
- If a patient's sleep is adequate, assess the patient's usual bedtime, normal bedtime ritual, preferred environment for sleeping, and usual rising time.
- When a patient reports a sleep problem, conduct a complete sleep history. Diagnosing sleep problems depends on identifying the factors that impair sleep.
- When planning interventions to promote sleep, consider the characteristics of the patient's home environment and normal lifestyle.
- A regular bedtime routine of relaxing activities prepares a person physically and mentally for sleep.
- An environment with a darkened room, reduced noise, comfortable bed, and good ventilation promotes sleep.
- Important nursing interventions for promoting sleep in the hospitalized patient are controlling noise levels and establishing periods for uninterrupted sleep and rest.
- Control of pain or other disease symptoms is essential in promoting the ability to sleep.

- Long-term use of sleeping pills often leads to difficulty in initiating and maintaining sleep.

✦ CRITICAL THINKING EXERCISES

1. Andree returns to the health care clinic with her husband, David, for a follow-up visit. She tells you that since she started her sleep hygiene plan she feels more rested but is still having some problems sleeping because of her husband's loud snoring. In addition to Andree's report of David's snoring, you note that he is overweight. On the basis of Andree's report of David's snoring, what additional assessment data should you gather from David?
2. On the basis of David's reported symptoms, what problem do you suspect he might have?
3. What action do you take at this time?
4. Andree and David also tell you that they are concerned about their 15-year-old daughter. Her grades in school are getting worse, and she says she is always tired. What do you need to know about their daughter's sleep patterns?
5. What would you recommend to Andree and David about their daughter?

✦ REVIEW QUESTIONS

1. You are gathering a sleep history from a patient who is being evaluated for obstructive sleep apnea. What symptom is the patient most likely to report?
 1. Headache
 2. Early awakening
 3. Impaired reasoning
 4. Excessive daytime sleepiness
2. When preparing a plan of care to promote sleep for a hospitalized patient, which of the following priority nursing interventions would you incorporate?
 1. Ensure that the patient follows hospital routines.
 2. Avoid awakening the patient for nonessential tasks.
 3. Give prescribed sleeping medications at dinner.
 4. Turn the TV volume down for late-night programming.
3. Older adults are cautioned about the long-term use of sedatives and hypnotics because these medications are characterized by which of the following statements?
 1. They cause headaches and nausea.
 2. They are expensive and difficult to obtain.
 3. They cause severe depression and anxiety.
 4. They can lead to sleep disruption.
4. You are providing health teaching for a patient using herbal compounds, such as valerian, to aid sleep. Key information about the use of herbal compounds would include the following:
 1. It can cause urinary retention.
 2. It may cause diarrhea and anxiety.
 3. It may interfere with prescribed medications.
 4. It can lead to further sleep problems over time.
5. A patient reports having vivid dreams. Through your understanding of the sleep cycle, you recognize that vivid dreaming occurs during which sleep phase?
 1. REM sleep
 2. Stage 1 NREM sleep
 3. Stage 4 NREM sleep
 4. Transition period from NREM to REM sleep

6. You are providing instruction for a patient who is having difficulty falling asleep. You identify the need for further instruction when the patient says which of the following statements?
 1. I should avoid having drinks with caffeine before going to bed.
 2. If I can't get to sleep right away, I should get up and read a book.
 3. I should have an alcoholic drink before bedtime to help me relax.
 4. I should avoid exercising just before going to bed.
7. Which of the following interventions is appropriate to include in a care plan for improving sleep in the older adult?
 1. Decrease fluids 2 to 4 hours before sleep.
 2. Exercise in the evening to increase fatigue.
 3. Allow the patient to sleep as late as possible.
 4. Take a nap during the day to make up for lost sleep.
8. Which statement made by a mother being discharged to home with her newborn infant indicates a need for further teaching?
 1. I won't put the baby to bed with a bottle.
 2. For the first few weeks, we are putting the cradle in our room.
 3. My grandmother told me that babies sleep better on their stomachs.
 4. I know I will have to get up during the night to feed the baby when he wakes up.
9. You are developing a plan of care for a patient experiencing narcolepsy. Which of the following interventions is appropriate to include in the plan?
 1. Increase the amount of carbohydrates in the diet.
 2. Limit fluid intake 2 hours before bedtime.
 3. Preserve energy by limiting exercise to morning hours.
 4. Take one or two 20-minute naps during the day.
10. Which of the following nursing measures promotes sleep in school-aged children?
 1. Encourage evening exercise.
 2. Encourage television viewing.
 3. Ensure the room is dark and quiet.
 4. Encourage quiet activities before bedtime.

✦ RECOMMENDED WEB SITES

Canadian Lung Association: <http://www.lung.ca>

This Web site provides information on obstructive sleep apnea, including strategies to enhance living with OSA and treatment modalities such as continuous positive airway pressure devices. Sleep apnea in children is discussed with exploration of strategies to reduce the impact of sleep apnea, including optimal nutrition and the use of CPAP devices.

Canadian Sleep Society: <http://www.css.to>

This Web site provides a conduit for health care providers and researchers who are interested in sleep-related disorders with an emphasis on sleep research performed in Canada. The site also includes information for the public on sleep-related topics and links to other sleep-related organizations to enhance the understanding of sleep and its related disorders through public awareness.

Sleep Apnea: Public Health Agency of Canada: <http://www.phac-aspc.gc.ca/cd-mc/sleepapnea-apneesommeil/index-eng.php>

This Web site includes publications intended for health care providers and the general public related to sleep apnea and other sleep disorders. It also includes a link to "Fast Facts from the 2009 Canadian Community Health Survey—Sleep Apnea Rapid Response." This survey, conducted by Statistics Canada, estimated for the first time the prevalence of sleep apnea in the Canadian population.

National Sleep Foundation (US): <http://www.sleepfoundation.org>

This multilingual Web site, designed for both health care providers and the public, provides an exhaustive amount of information regarding a plethora of sleep-related topics; for example, restless leg syndrome, dementia, and menopause. The site includes sleep-related educational material and research reports such as the 2011 annual Sleep in America poll that explores the impact of communication technology on sleep.

Veterans Affairs Canada: <http://www.veterans.gc.ca>

Focusing on the affairs of veterans, this Web site provides links to services, benefits, publications, and fact sheets relevant to Canadian veterans. Additionally, the site explores many issues facing Canadian veterans, including the impact of post-traumatic stress disorder (PTSD) on sleep and provides strategies to help get a good night's sleep.

Review Question Answers

1. 4, 2, 2, 2, 3, 4, 4, 4, 5, 1, 6, 3, 7, 1, 8, 3, 9, 4, 10, 4

Rationales for the Review Questions appear at the end of the book.

Pain Assessment and Management

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objectives

Mastery of content in this chapter will enable you to:

- Define the key terms listed.
- Discuss common misconceptions about pain.
- Describe the physiology of pain.
- Identify components of the pain experience.
- Explain how the physiology of pain relates to selecting interventions for pain relief.
- Describe the components of pain assessment.
- Perform an assessment of a patient experiencing pain.
- Explain how cultural factors influence the pain experience.
- Describe the appropriate nursing diagnoses, outcomes, and interventions for a patient with pain.
- Describe guidelines for selecting and individualizing pain interventions.
- Explain the various pharmacological approaches to treating pain.
- Describe applications for the use of nonpharmacological pain interventions.
- Discuss nursing implications for administering analgesics.
- Identify barriers to effective pain management.
- Evaluate a patient's response to pain interventions.

key terms

- | | |
|--------------------------------|---|
| Acupuncture, p. 1037 | Opioids, p. 1039 |
| Acute pain, p. 1021 | Pain, p. 1017 |
| Addiction, p. 1045 | Pain threshold, p. 1020 |
| Adjuvants, p. 1040 | Pain tolerance, p. 1021 |
| Anaesthetics, p. 1024 | Patient-controlled analgesia (PCA), p. 1040 |
| Analgesics, p. 1024 | Perception, p. 1019 |
| Biofeedback, p. 1037 | Physical dependence, p. 1045 |
| Breakthrough pain, p. 1022 | Placebos, p. 1045 |
| Chordotomy, p. 1043 | Pseudoaddiction, p. 1021 |
| Chronic pain, p. 1021 | Regional anaesthesia, p. 1042 |
| Cutaneous stimulation, p. 1037 | Reiki, p. 1037 |
| Dorsal rhizotomy, p. 1043 | Relaxation, p. 1036 |
| Drug tolerance, p. 1045 | Therapeutic touch, p. 1037 |
| Epidural analgesia, p. 1042 | Transcutaneous electrical nerve stimulation (TENS), p. 1038 |
| Epidural space, p. 1042 | Transduction, p. 1018 |
| Guided imagery, p. 1036 | Transmission, p. 1018 |
| Local anaesthesia, p. 1042 | |
| Modulation, p. 1019 | |
| Nociception, p. 1018 | |

media resources

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Pain is a common reason people seek health care. Despite being a commonly occurring symptom, even experienced by premature infants, pain is not well understood and is inconsistently and inadequately addressed (Stevens et al., 2011). **Pain** is defined as “an unpleasant, subjective sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage” (International Association for the Study of Pain Subcommittee on Taxonomy [IASP], 1979, 2008). This definition recognizes the physical and psychological nature of the pain experience. Pain is a highly personal experience, which can be accurately described only by the individual experiencing it (Pasero & McCaffery, 2011). This concept has endured for more than 40 years, when McCaffery first defined pain as “whatever the experiencing person says it is, existing

whenever he says it does" (McCaffery et al., 2011, p. 21). In recent years, definitions of pain have evolved to include the notion that a person's inability to verbally communicate does not preclude the possibility that pain is present or negate the responsibility of health care providers to treat it (Herr et al., 2006).

Relief from pain is considered a basic human right (Canadian Pain Society [CPS], 2001). Yet, in Canada, acute pain in hospitalized infants (Johnston et al., 2011), children (Stinson et al., 2008), and adults (Roth et al., 2005) and chronic pain in children (Palmero, 2009), adults (Boulanger et al., 2007), and the elderly (Martin et al., 2005) continue to be poorly assessed and treated. Nurses are ethically responsible for assessing and alleviating pain through the use of appropriate, evidence-informed pain management and provision of comfort measures. Nurses are also legally and ethically obligated to advocate for change in the care plan when pain relief is inadequate (Registered Nurses' Association of Ontario [RNAO], 2007). Responsive, evidence-informed pain management not only lessens pain but also improves quality of life and promotes earlier mobilization and return to work, resulting in fewer hospital and clinic visits, shortened hospital stays, and reduced health care costs.

Scientific Knowledge Base

Pain is part of the human experience. In the past, pain was viewed simply as a symptom of an illness or condition. Now, pain is understood to be complex, and chronic pain is considered to be a disease in its own right (Brookoff, 2000).

Nature of Pain

Pain is much more than a physical sensation caused by a specific stimulus. An individual's perception of pain has important *affective* (emotional), cognitive, behavioural, and sensory components that are shaped by past experience, culture, and situational factors. The nature of the stimulus for pain can be physical, psychological, or a combination of both.

Physiology of Pain

Pain is often classified by its inferred pathophysiology: nociceptive (physiological) pain or neuropathic pain. Nociceptive pain involves the normal neural processing of noxious stimuli that occurs when free nerve endings are activated by tissue damage or inflammation, while neuropathic pain involves the abnormal processing of stimuli from the peripheral or central nervous system and is thought to serve no useful purpose (Pasero & Portenoy, 2011).

Nociception has four specific processes: transduction, transmission, perception, and modulation (Arnstein, 2010). Patients in pain cannot discriminate among these four processes. However, understanding them will help you to recognize factors that can cause pain, symptoms that accompany pain, and the rationale and actions of selected therapies.

The first process involved in nociception is **transduction**. When tissue is damaged by thermal stimuli (e.g., burn), mechanical stimuli (e.g., cut), or chemical stimuli (e.g., chemotherapy), the damaged cells release sensitizing and inflammatory substances such as prostaglandins, bradykinin, histamine, prostaglandins, serotonin, and substance P (Box 41-1). These substances then activate nociceptors, resulting in transduction, or the generation of an electrical impulse (Pasero & Portenoy, 2011).

► BOX 41-1

Neurophysiology of Pain: Neuroregulators

Neurotransmitters (Excitatory)

Substance P

Found in the pain neurons of the dorsal horn (excitatory peptide)
Needed to transmit pain impulses from the periphery to the higher brain centre
Causes vasodilation and edema

Serotonin

Released from the brain stem and dorsal horn to inhibit pain transmission

Prostaglandins

Generated from the breakdown of phospholipids in cell membranes
Believed to increase sensitivity to pain

Neuromodulators (Inhibitory)

Endorphins and Dynorphins

Function as the body's natural supply of morphine-like substances
Activated by stress and pain
Located within the brain, spinal cord, and gastrointestinal tract
Cause analgesia when they attach to opiate receptors in the brain
Present in higher levels in people who have less pain than others with a similar injury

Bradykinin

Released from plasma that leaks from surrounding blood vessels at the site of tissue injury
Binds to receptors on peripheral nerves, increasing pain stimuli
Binds to cells that cause the chain reaction—producing prostaglandins

In the second process, **transmission**, these pain-sensitizing substances surround the pain fibres in the extracellular fluid, creating the spread of the pain message via the afferent peripheral nerve fibres to the spinal cord. Within the dorsal horn of the spinal cord, a synaptic transmission from the *afferent* (sensory) peripheral nerve to the spinothalamic tract nerves occurs through a complex neurophysiological and neurochemical mechanism, resulting in the relay of the signal to various higher brain centres (Arnstein, 2010; Figure 41-1).

Two types of afferent peripheral nerve fibres conduct painful stimuli: the fast, myelinated A-delta fibres, and the very small, slow, unmyelinated C fibres. The A fibres send sharp, localized, and distinct sensations that focus the source of the pain and detect its intensity. The C fibres relay impulses that are poorly localized, burning, and persistent (Meyer et al., 2006). For example, after stepping on a nail, a person initially feels a sharp, localized pain, which is a result of A-fibre transmission. Within a few seconds, the pain becomes more diffuse and widespread, until the whole foot aches, as a result of C-fibre innervation.

Pain stimuli continue to travel through nerve fibres in the spinothalamic tracts that cross to the opposite side of the spinal cord. Pain impulses then travel up the spinal cord. Figure 41-2 shows the normal pain reception pathway. After the pain impulse ascends the spinal cord, information is quickly transmitted by the thalamus to higher centres in the brain. These centres include the reticular formation, limbic system, somatosensory cortex, and association cortex.

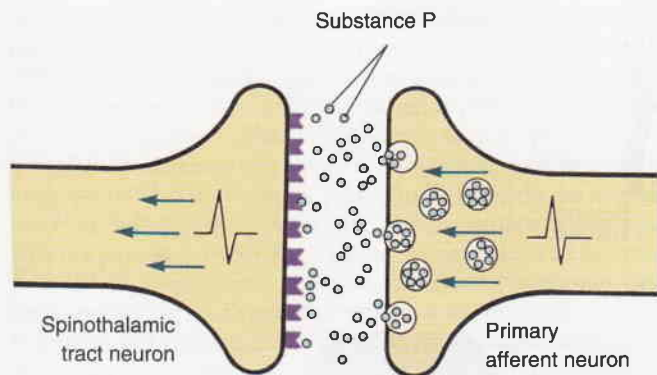


Figure 41-1 Substance P and other neurotransmitters are released from primary afferent fibres that terminate in the dorsal horn of the spinal cord. **Source:** Paice, J. A. (1991). *Unraveling the mystery of pain.* *Oncology Nursing Forum*, 18(5), 843.

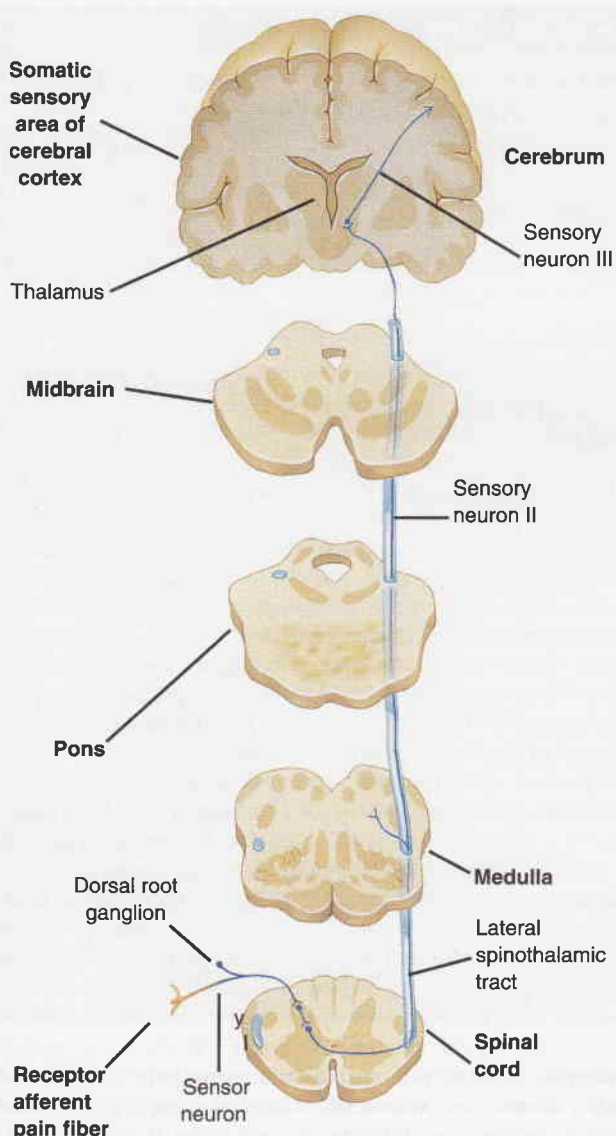


Figure 41-2 Spinothalamic pathway that conducts pain stimuli to the brain.

Perception, the third nociceptive process, is the conscious awareness of pain. Once a pain stimulus reaches the cerebral cortex, the brain interprets the intensity, quality, and character of the pain, and information from past experiences. As well, psychological, social, spiritual, and cultural associations are used to process the perception of the pain (Arnstein, 2010). The somatosensory cortex identifies the location and intensity of the pain, and the association cortex determines how we feel about the pain. Certain cells within the limbic system are believed to control emotion, particularly anxiety. Thus, the limbic system may play an active role in processing the emotional reaction to pain and the memory of the pain experience (Shyu & Vogt, 2009). However, the human ability to experience and remember pain does not depend on *cognitive ability* (explicit memory). The experience of pain is remembered by even the youngest of infants, including those born prematurely (Grunau & Tu, 2007). Pain studies using animal models have shown that significant exposure to pain can permanently alter a developing organism's pain mechanism (Sternberg & Al-Chaer, 2007). This suggests that physiological and implicit forms of pain memory take place in the first days of life.

As a person becomes aware of pain, a complex reaction unfolds. Psychological and cognitive factors interact with neurophysiological factors in the perception of pain. Perception gives awareness and meaning to pain so that a person can then react. The reaction to pain is the physiological and behavioural responses that occur after pain is perceived.

Modulation of pain is the final nociceptive phase and refers to the increase or decrease in pain signal intensity that can occur before, during, and after pain is perceived (Arnstein, 2010, p. 42). For example, once the brain perceives the pain, inhibitory neurotransmitters are released (see Box 41-1); these include endogenous opioids (endorphins and enkephalins), serotonin, norepinephrine, and gamma aminobutyric acid, which work to hinder the transmission of pain and help produce an analgesic effect (Arnstein, 2010).

A protective reflex response may also occur with pain reception (Figure 41-3). A-delta fibres send sensory impulses to the spinal cord, where they synapse with spinal motor neurons. The motor impulses travel via a reflex arc along *efferent* (motor) nerve fibres back to a peripheral muscle near the site of stimulation, thus bypassing the brain. Contraction of the muscle leads to a protective withdrawal from the source of pain. For example, when a person touches a hot iron, a burning sensation is felt, but the hand also reflexively withdraws from the iron's surface. When superficial fibres in the skin are stimulated, a person moves away from the pain source. If internal tissues such as muscle or mucous membranes become stimulated, tightening and guarding of muscles occur. This reflex is usually absent below the injury in patients with spinal cord injuries. However, patients with spinal cord injuries can still experience pain above the level of injury (Widerström-Noga et al., 2009).

Gate-Control Theory of Pain. No specific pain centre exists in the nervous system. Melzack and Wall's gate-control theory (1965) was the first to suggest that in addition to the physical sensation, pain has emotional and cognitive dimensions and that pain impulses can be regulated or even blocked by gating mechanisms located along the central nervous system. The theory suggests that pain impulses pass through when a gate is open and that impulses are blocked when a gate is closed. Closing the gate is the basis for pain-relief interventions. Gating mechanisms can be found in substantia gelatinosa

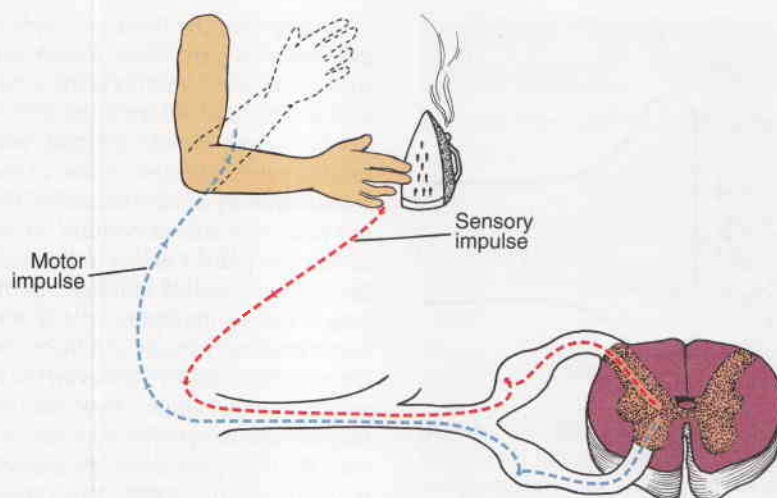


Figure 41-3 Protective reflex to pain stimulus.

cells within the dorsal horn of the spinal cord, thalamus, and limbic system. Understanding what physiological, emotional, and cognitive processes can influence these gates will help guide your approach to pain management. For example, stress, exercise, and other factors increase the release of endorphins, raising an individual's **pain threshold**, or the minimal intensity of a stimulus that is perceived as painful (IASP, 2008). Knowing that the amount of modulating substances varies with each person will help you to understand why pain intensity varies among patients, even for comparable stimuli, and why individuals exhibit different responses to pain.

Physiological Responses. As pain impulses ascend the spinal cord toward the brain stem and thalamus, the autonomic nervous system (ANS) becomes stimulated as part of the stress response. Superficial pain and pain of low to moderate intensity elicit the fight-or-flight reaction of the general adaptation syndrome (see Chapter 29). Stimulation of the sympathetic branch of the ANS results in physiological responses (Table 41-1). If the pain is continuous, severe, or deep, typically involving the visceral organs (e.g., with a myocardial infarction or colic from gallbladder or renal stones), the parasympathetic nervous system goes into action. Sustained physiological responses to pain could cause serious harm to an individual, such as altered immune response (Rittner et al., 2008). Except in cases of severe traumatic pain, which may result in shock, most people reach a level of adaptation in which physical signs return to normal. Thus, patients in pain will *not* always show changes in their vital signs. You need to consider physiological responses, but should avoid using them as sole measures to infer pain.

Behavioural Responses. Once pain is experienced, a cycle of events begins that, if not treated, managed, or relieved, can significantly diminish the meaning and quality of a person's life. Pain, especially intense acute pain or chronic pain, is physically and emotionally exhausting and thus can interfere, short or long term, with the ability to function and engage with others. Anxiety is often present initially, while depression, irritability, and chronic fatigue often accompany persistent pain. These responses to pain help explain why pain management can be so challenging.

Pain threatens physical, psychological, social, and spiritual well-being. Some patients will endure severe pain without

► TABLE 41-1 Physiological Reactions to Pain

Response	Cause or Effect
Sympathetic Stimulation*	
Dilation of bronchial tubes and increased respiratory rate	Provides increased oxygen intake
Increased heart rate	Provides increased oxygen transport
Peripheral vasoconstriction (pallor, elevation in blood pressure)	Elevates blood pressure with shift of blood supply from periphery and viscera to skeletal muscles and brain
Increased blood glucose level	Provides additional energy
Diaphoresis	Controls body temperature during stress
Increased muscle tension	Prepares muscles for action
Dilation of pupils	Affords better vision
Decreased gastrointestinal motility (nausea, vomiting)	Frees energy for more immediate activity
Parasympathetic Stimulation†	
Pallor	Causes blood supply to shift away from periphery
Muscle tension	Results from fatigue
Decreased heart rate and blood pressure	Results from vagal stimulation
Rapid, irregular breathing	Causes body defences to fail under prolonged stress of pain
Weakness or exhaustion	Results from expenditure of physical energy

*Superficial pain and pain of low to moderate intensity.

†Severe or deep pain.

asking for assistance. Some may not report pain if they believe their pain may inconvenience others or signals a loss of self-control. To ensure optimal health outcomes, it is important to discuss the benefits of using effective pain-management strategies with the patient so that activities of daily living are not seriously compromised. Remember, how patients respond to,

and their tolerance for, pain may significantly influence your perception of their degree of discomfort (McCaffery et al., 2007). Patients deemed to have a low **pain tolerance**, which is the greatest level of pain an individual is prepared to endure in a given situation (IASP, 1979, 2008), may be perceived as complainers. Acknowledge your own views, and avoid making judgements about another's pain. Teach patients the importance of self-reporting. Consider the immediate context in which a patient is experiencing pain, as well as his or her past pain experiences. Base your pain assessment and pain care decision making on a variety of sources and observations, such as patient self-reporting, family feedback, the patient's behaviour and physiology, and internal and external environmental factors.

Examples of body movements, facial expressions, and vocalizations that may indicate pain are protecting the painful part, bracing, rocking, body stiffening, jaw clenching, grimacing, frowning, crying, moaning, or screaming. Affective responses may be withdrawal, stoicism, fear, anxiety, anger, or feelings of hopelessness. You will learn to recognize common behaviour patterns that reflect pain, but you will need to remain flexible in your conclusions. Lack of pain expression does not necessarily mean that a person has no pain. For example, premature and full-term infants sometimes do not cry, and they may exhibit few motor movements, especially after excessive and repeated exposure to pain (Stevens, McGrath, et al., 2007). Similarly, opioids can blunt the behavioural expression of pain by sedating the patient. Yet, the patient who is sedated or sleeping can still be in pain (Pasero & Portenoy, 2011).

Types of Pain

There are many ways to classify pain. For example, pain may be categorized by duration, such as acute and chronic pain, or pathology, such as cancer pain and noncancer pain (e.g., pain associated with arthritis, diabetic neuropathy, low back pain, and headache).

Acute Pain. Acute pain usually has an identifiable cause, either somatic, visceral, or nociceptive (Arnstein, 2010), and is of short duration (usually less than six months). Acute pain has a predictable ending (healing) and an identifiable cause, and eventually resolves with or without treatment after a damaged area heals. Evidence, however, suggests that unrelieved acute pain may have development- and age-related consequences. For instance, significant and repeated exposure to acute pain during epochs of rapid early infant brain development may alter an infant's pain response (Taddio & Katz, 2005). Untreated or poorly treated intraoperative and postoperative pain and stress can also increase infant mortality and morbidity (Fitzgerald & Walker, 2009) or result in the development of chronic postsurgical pain (Macrae, 2008).

No matter what the age, unrelieved acute pain can seriously threaten recovery, resulting in prolonged hospitalization, increased risk of complications from immobility (see Chapter 45), and delayed rehabilitation. Physical or psychological progress may be compromised as long as acute pain persists, because the patient's prime focus may be on pain relief. Although complete pain elimination may not be achievable, working with your patient and the health care team to reduce pain to an acceptable level is realistic. Your primary goals should be to prevent pain whenever possible, effectively manage pain, and provide pain relief that allows patients to participate in their recovery.

Chronic Pain. Chronic pain was formerly defined as pain that is present for at least six months, persists beyond the normal time of healing, and may not have an identifiable cause (Jovey et al., 2003). It is now recognized that key elements of chronic pain can be evident much earlier (American Pain Society [APS], 1999). Chronic pain can be intermittent (occurs in a pattern) or persistent (lasting more than 12 hours daily) (Canadian Pain Coalition, 2011), experienced at any point in life, including early childhood (Stinson et al., 2011), and lead to great personal suffering. Chronic pain may be noncancerous or cancerous. Chronic noncancer pain is usually not life-threatening. However, patients with chronic noncancer pain are often frustrated because they never know how they will feel from day to day and the pain may be unrelenting. The pain may stem from an injured area that healed long ago but continues to result in pain that is nonresponsive to treatment. Chronic noncancer pain may be experienced along with other symptoms such as sleep disturbances, depression, anxiety, and anger (Wasan et al., 2007). This type of pain may be a major cause of psychological and physical disability, leading to problems such as job loss, the inability to perform simple daily activities, sexual dysfunction, and social isolation from family and friends.

Despite the fact that Canadians are among largest opioid users per capita in the world—indicative of a growing misuse of opioids—undertreated chronic noncancer pain is a challenge faced by patients and health care providers (College of Physicians and Surgeons of Ontario, 2010; National Opioid Use Guideline Group [NOUGG], 2010a). Now, more than ever, health care providers may be reluctant to treat this type of pain with opioids. Often, patients with chronic noncancer pain who exhibit behaviours seen in addictive disease, such as increasing demands for larger doses of opioids, are mistakenly diagnosed with addiction (i.e., **pseudoaddiction**) (Pasero et al., 2011). In fact, they are actually seeking pain relief as a result of undertreated pain. To help break the cycle of poor pain management, inform patients about concerns raised when they seek help from multiple health care providers, and refer the patient to a pain team, or chronic pain clinic if possible. A new Canadian guideline by NOUGG (2010b) addresses these challenges with recommendations and tools for safe and responsible selection, prescription, titration, and monitoring of opioids.

The beliefs and coping strategies used by individuals with chronic pain may determine how they will function with and adjust to pain. Esteve and colleagues (2007) found that individuals who believed they could control their pain, avoided viewing their condition as a tragedy, and believed that they were not severely disabled appeared to function better than those who did not. You should emphasize to the patient that pain can be successfully managed, although not necessarily cured. Make use of a comprehensive approach that includes both nonpharmacological and pharmacological strategies. Help strengthen the individual's confidence in his or her ability to control the pain, and suggest referral for treatment of possible depression, if necessary. Keep yourself updated about the best examples of adaptive coping strategies, such as cognitive behaviour therapy, by conducting a search of health databases.

Cancer Pain. Pain in a patient with cancer may be acute, chronic, or both. The pain may also be nociceptive, neuropathic, or both. Cancer pain may be caused by tumour progression and its related pathological process, invasive procedures, toxicities of treatment, infection, and physical limitations. It

can be sensed at the actual site of the tumour or distant to the site, which is called *referred* pain. A new report of pain by a patient with existing pain needs to be investigated. Although the need for treatment of cancer pain has become increasingly evident, the issue of undertreatment continues (Caraceni et al., 2004). Many individuals with cancer pain live in community settings, and pain relief is often provided by their families. Research findings suggest that accessing community resources may be difficult for these families and that the stress of caring for a loved one with cancer pain can affect the health of family caregivers (Harrison et al., 2009). The importance of establishing an organized, systematic, and comprehensive approach to pain assessment and treatment, as well as communicating with and supporting patients' families, cannot be overemphasized; nurses have the potential to play pivotal roles in these endeavours.

Pain by Inferred Pathology Process. Identifying the cause of pain is one of the first steps in successfully managing pain. Nociceptive pain is subdivided into *somatic* (musculoskeletal) and *visceral* (internal organ) pain. Neuropathic pain arises from abnormal or damaged pain nerves (Table 41-2). Each of these pathological processes has distinct pain characteristics that are discussed under pain assessment.

Breakthrough Pain. Some patients experience occasional, transitory exacerbations of intense pain, called **breakthrough pain**, because the pain “breaks through” the regular pain medication that adequately controls the baseline pain. Research has shown that breakthrough pain is not routinely recognized, evaluated, and treated (Portenoy et al., 2006). When breakthrough pain is brief and precipitated by an activity-related action, such as movement, sneezing, or coughing, it is referred to as *incident pain* (Pasero, Quinn et al., 2011, p. 310). *Idiopathic pain*, another subtype of breakthrough pain, is not associated with an identifiable cause and has a longer duration than incident pain (p. 310).

Nursing Knowledge Base

In *Notes on Nursing: What It Is and What It Is Not*, Florence Nightingale (1859; 1969) stated that “pain . . . perpetuates and intensifies itself.” Thus, nurses have a long history of dealing with the effects of pain on patients. In this section, factors that influence pain are explored.

Knowledge, Attitudes, and Beliefs

There are many factors that influence clinicians' tendencies to doubt patients' reports of pain. It is important to acknowledge that the knowledge, attitudes, and preferences of health care providers, including your own, will influence pain care decision making. Numerous studies on how clinicians judge the pain of others have indicated that, when compared with patients' self-reports, health care providers tend to underestimate or, on occasion, overestimate the patients' pain (McCaffery et al., 2007; Prkachin et al., 2007). For example, it has been demonstrated that nurses tend to overestimate pain when patients report no pain and underestimate pain when patients report mild to intense pain (Heikkinen et al., 2005), or when they are told that patients might be faking pain to obtain opioids (Kappesser et al., 2006). Experienced clinicians who repeatedly inflicted pain on patients tended to rate the clinical practice situation as less painful than inexperienced clinicians (Cheng et al., 2007). Differences in pain ratings may also result from the type of tool used for pain assessment

► TABLE 41-2

Classification of Pain by Inferred Pathology: Two Major Types of Pain

I. Nociceptive pain: Normal processing of stimuli that damages normal tissues or has the potential to do so if prolonged; usually responsive to nonopioids, opioids, or both.	II. Neuropathic pain: Abnormal processing of sensory input by the peripheral or central nervous system; treatment usually includes adjuvant analgesics.
A. Somatic pain: Arises from bone, joint, muscle, skin, or connective tissue. It is usually aching or throbbing in quality and is well localized.	A. Centrally generated pain. 1. Deafferentation pain. Injury to either the peripheral or central nervous system. Examples: Phantom pain may reflect injury to the peripheral nervous system; burning pain below the level of a spinal cord lesion reflects injury to the central nervous system. 2. Sympathetically maintained pain. Associated with dysregulation of the autonomic nervous system. Examples: May include some of the pain associated with complex regional pain syndrome (type I, type II).
B. Visceral pain: Arises from visceral organs, such as the gastrointestinal tract and pancreas. This may be subdivided: 1. Tumour involvement of the organ capsule, which causes aching and fairly well-localized pain. 2. Obstruction of hollow viscus, which causes intermittent cramping and poorly localized pain.	B. Peripherally generated pain 1. Painful polyneuropathies. Pain is felt along the distribution of many peripheral nerves. Examples: Diabetic neuropathy, alcohol-nutritional neuropathy, and those associated with Guillain-Barré syndrome. 2. Painful mononeuropathies. Usually associated with a known peripheral nerve injury, and pain is felt at least partly along the distribution of the damaged nerve. Examples: Nerve root compression, nerve entrapment, trigeminal neuralgia.

Sources: Pasero, C., & McCaffery, M., (2011). *Pain assessment and pharmacological management* (p. 2). St Louis, MO: Mosby/Elsevier. Copyright © 2011, Pasero C., McCaffery, M. May be duplicated for use in clinical practice. Data from Max, M. B., & Portenoy, R. K. (2003). Methodological challenges for clinical trials of cancer pain treatments. In C. R. Chapman & K. M. Foley (Eds.), *Current and emerging issues in cancer pain: Research and practice*. New York: Raven Press; and Portenoy, R. K. (1996). Neuropathic pain. In R. K. Portenoy & R. M. Kanner (Eds.), *Pain management: Theory and practice*. Philadelphia, PA: F. A. Davis.

► BOX 41-2

Common Biases and Misconceptions About Pain

The following statements are false:

- Drug abusers and alcoholics overreact to discomfort.
- Patients with minor illnesses have less pain than do those with severe physical alterations.
- Regular administration of analgesics will lead to drug addiction.
- The amount of tissue damage in an injury can accurately indicate pain intensity.
- Health care providers are the best authorities on the nature of a patient's pain.
- Psychogenic pain is not real.
- Chronic pain is psychological.
- Patients should expect to have pain during a hospital stay.
- Patients who cannot speak do not feel pain.

(Chambers et al., 2005). We are often unaware of the process of inferring pain in others, yet our judgements guide our actions. For example, a nurse's personal opinion about the patient's report of pain affects the titration of opioid doses (McCaffery et al., 2011).

Making assumptions about patients in pain may seriously limit your ability to offer pain relief. Too often, nurses allow misconceptions about pain (Box 41-2) to affect their willingness to intervene. Some even avoid acknowledging a patient's pain because of their own fear and denial. Nurses are entitled to their personal beliefs; however, they must accept the patient's report of pain and act according to professional guidelines, standards, position statements, policies and procedures, and evidence-informed research findings. View the experience of pain from the patient's perspective. Become an active, knowledgeable observer of a patient in pain. This will not only help you to be more objective, it will allow you to provide a more holistic and effective approach to your pain care decision making and actions. These expressions of professionalism will be meaningful to the individual and improve his or her pain outcomes. The patient makes the observation that pain is present, and you apply techniques and skills that ultimately give relief.

Factors Influencing Pain

Pain is complex and involves physiological, social, spiritual, psychological, and cultural influences. Each individual's pain experience is different. Consider all factors that affect the patient in pain.

Physiological Factors

Age. Age is an important variable that influences pain, particularly in infants and older adults. Developmental differences among these age groups influence how children and older adults perceive and react to pain. Young children have difficulty understanding the procedures that you perform that may cause pain. Cognitively, toddlers and preschoolers are often unable to recall explanations about pain, or they associate pain with experiences that can occur in various situations. They may also have difficulty expressing their pain or may use verbal descriptors that differ from those used by older individuals (Stanford et al., 2005). Consider adapting your approaches when assessing pain in a child (including what to ask and the behaviours to observe). Help prepare the child for a painful procedure. Ask the child and parents about the terms most often used by the child to describe the pain experience

* BOX 41-3

FOCUS ON OLDER ADULTS

- With aging, muscle mass decreases, body fat increases, and the percentage of body water decreases. This results in the potential for an increased concentration of water-soluble drugs, such as morphine. Also, the volume of distribution for fat-soluble drugs, such as fentanyl, increases (Pergolizzi et al., 2008).
- Older adults frequently eat poorly, resulting in low serum albumin levels. Many drugs are highly protein bound. In the presence of low serum albumin, more of the active form of a drug remains unbound, which increases the risk for side effects, toxic effects, or both (Lehne, 2010).
- Decline of hepatic and renal function is a natural occurrence with aging. This results in reduced metabolism and excretion of drugs. Hence, older adults often experience a greater peak effect and longer duration of analgesics (Pergolizzi et al., 2008).
- Age-related changes in the skin, such as thinning and loss of elasticity, could affect the absorption rate of topical analgesics. However, transdermal analgesics have been proven beneficial for elderly patients and are particularly suitable for those with impaired gastrointestinal function (Pergolizzi et al., 2008).
- Patient-controlled analgesia (PCA) and regional analgesia are not contraindicated in older adults, but frequent assessment of pain, the side effects of analgesics, and cognition are necessary to ensure the efficacy and safety of PCA.
- The loss of the efficiency of homeostatic mechanisms puts older adults at risk for falls or delirium after the administration of sedative drugs or regional anaesthesia (Aubrun, 2005).

and pain treatment, and then use those terms when communicating about pain with the child.

Older adults may be more sensitive to severe pain as a result of structural, biochemical, and functional changes (Pergolizzi et al., 2008). Many elderly patients suffer cognitive impairment, confusion, or memory loss, either from pathology or medication, which can be compounded by sight and hearing impairment. Mobility, activities of daily living (ADLs), social activities outside the home, and activity tolerance can all be reduced. Pain in an older adult requires aggressive assessment, diagnosis, and management (Box 41-3).

The ability of older patients to interpret pain can be complicated by the presence of multiple diseases with vague symptoms that affect similar parts of the body. You will need to undertake a detailed assessment when a patient has more than one source of pain (Herr, 2002a, 2002b). The manifestations of different diseases can cause atypical presentations of painful conditions. Different diseases can also cause similar symptoms. For example, chest pain does not always indicate a heart attack; it may be a symptom of arthritis of the spine or of an abdominal disorder. Not all older adults experience cognitive impairment. However, when older adults are confused, they may not be able to recall and explain details of pain experiences. Misconceptions about pain management in the very young and in older adults may seriously hamper effective pain management for these populations (Tables 41-3 and 41-4).

Fatigue. Fatigue heightens pain perception, intensifies pain, and decreases coping abilities. This is a common problem for patients with long-term illnesses or with fatigue as a result of treatment. If fatigue occurs along with sleeplessness, the

► TABLE 41-3 Pain in Infants

Misconception	Correction
Infants cannot feel pain or are less sensitive to pain because of an immature nervous system.	Neuronal pathways are in place during gestation; consequently pain response exists even in the very premature neonate. Preterm and full-term neonates may have a greater sensitivity to pain than older infants and children. This is because of the high density of cutaneous nerve fibres, and their developing, but still immature, ability to inhibit transmission of sensory nerve impulses.
Infants are incapable of expressing pain.	Although infants cannot verbalize pain, they respond with behavioural cues and physiological indicators that can be observed by others.
Infants must learn about pain from previous painful experiences.	Emotional processing and cognitive abilities are maturational in nature and can influence the expression of pain and the ability to cope with pain. However, pain is present with the first insult; it need not be learned from an earlier painful experience (Grunau & Tu, 2007).
Pain cannot be accurately assessed in infants.	Behavioural responses, primarily facial expressions, can be reliably and validly assessed. Specific facial expressions are acknowledged as the most specific indicator of pain in response to acute noxious stimuli (Stevens, Pillai Riddell, et al., 2007). Numerous pain-assessment tools incorporating behavioural, physiological, and contextual indicators are available and recommended for use as part of effective pain management (Stevens, Pillai Riddell, et al., 2007).
Because infants cannot demonstrate cognitive awareness, they are insensible and lack memory for pain.	Early and repeated exposure to noxious stimuli can affect the infant's future responses to painful events (Grunau & Tu, 2007).
Analgesics and anaesthetics cannot be safely given to infants and neonates because of their immature capacity to metabolize and eliminate drugs, as well as their sensitivity to opioid-induced respiratory depression.	Infants older than one month of age metabolize drugs in the same manner as older infants and children. Careful selection of the agent, dosage, administration route, and time; frequent monitoring for desired and undesired effects; and drug titration and weaning can minimize the adverse effects of opioids and nonopioids for pain management in neonates (Taddio, 2007).

Sources: Adapted from McCaffery, M., & Pasero, C. (1999). *Pain: Clinical manual* (2nd ed.). St Louis, MO: Mosby; and Twycross, A. (2009). Why managing pain in children matters. In A. Twycross, S. J. Dowden, and E. Bruce (Eds.), *Managing pain in children: A clinical guide* (p. 5). Oxford, UK: Wiley-Blackwell.

perception of pain may be even greater. Less pain is often experienced after a restful sleep than at the end of a long day.

Heredity. Recent research on animal models suggests that genetic information passed on by parents might increase or decrease sensitivity to pain. What was historically described as pain threshold or pain tolerance may, in fact, be determined by genetic makeup (LaCroix-Fralish & Mogil, 2009).

Neurological Function. A patient's neurological function can influence the pain experience. Any factor that interrupts or influences normal pain reception or perception affects the patient's awareness of and response to pain. For example, patients who have a spinal cord injury, peripheral neuropathy (as in the case of diabetes mellitus), or a neurological disease (e.g., multiple sclerosis) experience altered pain sensation. Certain pharmacological agents influence pain perception and response. **Analgesics** (medications that relieve pain), sedatives, and **anaesthetics** (medications that cause temporary loss of sensation) depress functions of the central nervous system. Because patients at risk for pain insensitivity could suffer injury, they require preventive nursing care that includes neurological assessment (see Chapter 31).

Social Factors

Attention. The degree to which a patient focuses on pain can influence pain perception. Increased attention has been associated with increased pain, whereas distraction has been associated with a diminished pain response (Uman et al., 2008). This is a concept that nurses use when applying pain-relief interventions such as relaxation and massage. By focusing a patient's attention and concentration on other stimuli, his or her awareness of pain declines.

Previous Experience. Prior painful experiences may shape how a patient responds to subsequent painful events. If a person has had frequent episodes of pain without relief or has had bouts of severe pain, anxiety or fear may recur. In contrast, if a person has had repeated experiences with the same type of pain but the pain has been successfully relieved, it becomes easier to interpret the pain sensation. As a result, the patient is better prepared to take actions to relieve the pain.

When patients have had no prior exposure to a particular pain-inducing event, they may be unprepared, and this may impair their coping abilities. For example, severe incisional pain is common after abdominal surgery. Unless patients know to expect pain, they may view their incisional pain as a serious complication. As a result, they may tense up and breathe shallowly. Inform patients of the type of pain that might be experienced and methods to reduce it.

Family and Social Support. People in pain often depend on family or friends for support, assistance, or protection. A loved one can help minimize loneliness and fear. An absence of support can make the pain experience more stressful. The presence of parents is especially important for children with pain. Explain to the parent that children typically want their parents with them during a pain event, but warn them that a parent's own anxiety and responses may influence how the child experiences and responds to pain (Chambers et al., 2002). Provide parents with information about the procedure, and involve them by explaining how they can use pain-related distraction strategies with their child during the painful procedure.

Spiritual Factors. Religion and spirituality help individuals become part of a community or feel connected with nature or the universe. In some traditions, pain is viewed as retribution from God, or an opportunity to demonstrate the

TABLE 41-4 Pain in Older Adults

Misconception

Pain is a natural outcome of growing old.

Pain perception, or sensitivity, decreases with age.

If the older patient does not report pain, he or she does not have pain.

If an older patient appears to be occupied, asleep, or otherwise distracted from pain, he or she does not have pain.

The potential side effects of opioids make them too dangerous to use to relieve pain in older adults.

Patients with Alzheimer's disease and other cognitive impairments do not feel pain, and their reports of pain are most likely invalid.

Correction

Older adults are at greater risk than younger adults for many painful conditions; however, in the absence of disease, pain is not a normal part of aging.

Some studies suggest that greater age brings a higher threshold for painful electrical, thermal, and mechanical stimuli to the skin, while others have reported that older patients have alterations in the sensorineural apparatus, thus diminishing the perception of pain (Delgado-Guay & Bruera, 2008).

Older patients commonly underreport pain. Reasons include expecting to have pain with increasing age; not wanting to alarm loved ones; being fearful of losing independence; not wanting to distract, anger, or bother caregivers; and believing that caregivers know that the older patient has pain and are doing all that can be done to relieve it. The absence of a report of pain does not mean the absence of pain.

Older patients often believe it is unacceptable to show pain and have learned to use a variety of ways to cope with it instead (e.g., many patients use distraction successfully for short periods of time). Sleeping may be a coping strategy or may indicate exhaustion, not pain relief. Assumptions about the presence or absence of pain cannot be made solely on the basis of a patient's behaviour.

Opioids may be used safely in older adults. Although the opioid-naïve older adult may be more sensitive to opioids, this does not justify withholding their use in pain management for this population. Potentially dangerous opioid-induced side effects can be prevented with slow titration; regular, frequent monitoring and assessment of the patient's response; and adjustment of dose and interval between doses when side effects are detected. If necessary, clinically significant respiratory depression can be reversed by an opioid antagonist drug.

No evidence exists that cognitively impaired older adults experience less pain or that their reports of pain are less valid than those of individuals with intact cognitive function. It is probable that patients with dementia or other deficits of cognition suffer significant unrelieved pain and discomfort. Assessment of pain in these patients is challenging, but possible. The best approach is to accept the patient's report of pain and treat the pain as it would be treated in an individual with intact cognitive function.

Sources: Adapted from McCaffery, M., & Pasero, C. (1999). *Pain: Clinical manual* (2nd ed.). St Louis, MO: Mosby. Data from American Geriatrics Society. (2009). Pharmacological management of persistent pain in older persons. *Journal of American Geriatrics Society*, 57, 1331–1346. doi:10.1111/j.1532-5415.2009.02376.x; Delgado-Guay, M. O., & Bruera, E. (2008). Management of pain in the older person with cancer, Part 1: Pathophysiology, pharmacokinetics, and assessment. *Oncology*, 22(1), 56–61. Retrieved from www.globalaging.org/health/us/2008/cancerolder.pdf; and Hanks-Bell, M. N., Halvey, K., & Paice, J. A. (2004). Pain assessment and management in aging. *Online Journal of Issues in Nursing*, 9(3). Retrieved from www.nursingworld.org/MainMenuCategories/ANAMarketplace/ANAPeriodicals/OJIN/TableofContents/Volume92004/No3/Sept04/ArticlePreviousTopic/PainAssessmentandManagementinAging.aspx.

strength of character that will be rewarded after death. Prayer, hope, and seeking spiritual support, such as attendance at church, have been linked to less suffering associated with pain (Wachholtz et al., 2007). But severe or prolonged pain can permeate the very essence of the person, eroding what is important, often challenging established beliefs and values, which may result in poorer pain outcomes (Rippentrop et al., 2005). Similarly, for those who view humans as irreducible energy fields in continual interaction with universal sources of energy, pain may be intensified or lessened as a result of changes in energy patterns.

Spiritual assessment tools such as FICA (Faith, Belief, Meaning; Importance and Influence; Community; and Address/Action in Care) are available (Maxwell et al., 2005). Explore potential religious/spiritual coping strategies with your patients such as meaning-making, distraction, spiritual supports, and relaxation techniques. For example, suggest a visitation from the clergy for those based in religious traditions or support the choice of therapeutic touch, Reiki, and acupuncture as restorative modalities designed to improve energy-flow patterns. Providing interventions designed to holistically heal is essential for the best possible pain management.

Psychological Factors

Anxiety. The relationship between pain and anxiety is complicated. Anxiety is associated with many types of pain; however, the cause-and-effect relationship has not been established (McCaffery et al., 2011). Pain often causes anxiety, but it is not clear that anxiety increases the intensity of pain. However, pain-related anxiety can result in the avoidance of activities that a patient fears may cause pain. When anxiety goes unnoticed, it may be difficult to manage pain effectively. The management of anxiety through the use of nonpharmacological and pharmacological approaches is appropriate. However, anxiolytic medications should not be used as a substitute for analgesia.

Meaning of Pain. The meaning of pain affects the experience of pain and how one adapts to it. A person will perceive pain differently if it suggests a threat, loss, punishment, or challenge. For example, a woman in labour may perceive pain differently than a woman with a history of cancer who experiences new pain and fears recurrence.

Cultural Factors. Culture shapes individuals' responses, behaviours, and attitudes about pain, and how they react to and cope with pain. People learn what is expected and accepted by their culture. Based on your own cultural beliefs, as a nurse

you may also expect that others will or should respond to pain in a particular manner. However, by understanding that pain has different meanings for different cultures, you can design culturally sensitive care.

Some cultures are demonstrative about pain; others are introverted. Your knowledge of the level of a patient's assimilation into Canadian society may be helpful. For example, if several generations of an Asian patient's family have lived in Canada, the influence of the Asian culture may be limited. In contrast, a recent immigrant from another culture may have different beliefs from those of the larger Canadian population. Explore the impact of cultural differences on the patient's pain experience, and adjust the plan of care (Box 41-4). Work with

BOX 41-4 CULTURAL ASPECTS OF CARE

Culture affects behavioural responses to pain and treatment preferences. For example, the Chinese culture includes Confucianism, which maintains that pain is an essential element of life and is a trial or a sacrifice (Chen et al., 2008). Thus, a patient with this belief would rather endure pain and not report it to a clinician, although they may report it to a family member. Although it is important that you become culturally competent in order to understand the characteristics of a culture, this knowledge does not tell you what to expect of a particular patient (McCaffery et al., 2011). Therefore, we encourage you to be sensitive to the differences among all individuals by seeking information from each patient and family about their specific beliefs. Remember to be mindful of the fact that the more difference there is between you and your patient, the more difficult it is for you to assess and treat the patient.



Implications for Practice

- Emotional and cognitive responses to pain (overt, stoic) vary between and within cultures.
- Words used to express pain vary among cultures (hurt, ache, discomfort).
- Personal and social meanings of pain and past pain experiences affect pain perception.
- The meaning of pain may influence the perception of pain intensity.
- Health care providers' beliefs and expectations regarding pain expression influence the use of pain management strategies.
- Therapeutic goals of pain management are influenced by cultural beliefs.
- Be aware of perceived causal factors of pain (fate, lifestyle, punishment, witchcraft).
- Believe patients' reports about their perceived pain; do not act on your own beliefs about a patient's pain.
- Seek information about the cultural backgrounds of your patients through discussion with your patients and families and best published evidence.

Data from Al-Attiyyat, N. M. H. (2009). Cultural diversity and cancer pain. *Journal of Hospice and Palliative Nursing*, 11(3), 154–164. doi:10.1097/NJH.0b013e3181a1aca3; Davidhizar, R., & Giger J. N. (2004). A review of the literature on care of patients in pain who are culturally diverse. *International Nursing Review*, 51(1), 47–55. doi:10.1111/j.1466-7657.2003.00208.x; Lai, D. W. L., & Surood, S. (2009). Chinese health beliefs of older Chinese in Canada. *Journal of Aging and Health*, 21(1), 38–62. doi:10.1177/0898264308328636; Lasch, K. (2000). Culture, pain, and culturally sensitive pain care. *Pain Management Nursing*, 1(3 Suppl. 1), S16–22; Pasero, C., & McCaffery, M. (Eds.). (2011). *Pain assessment and pharmacological management*. St Louis, MO: Elsevier/Mosby.

the patient and family to facilitate communication about the assessment and management of pain. Find a culturally appropriate assessment tool, and communicate the use of that tool to other health care providers.

Critical Thinking

Critical thinking requires synthesizing knowledge, experience, patient information, critical thinking attitudes, and professional standards. Clinical judgements require that you anticipate the information you need, analyze the data, and make decisions about patient care. A patient's condition or situation is always changing; thus, it is essential during pain assessments to consider all critical elements that will enable you to make a nursing diagnosis.

Knowledge about pain physiology and factors that influence pain will help you to manage patients' pain effectively. With experience, you will become more skilled at assessing pain and choosing effective therapies. Successful pain management does not necessarily mean pain elimination, but rather the attainment of mutually agreed upon pain-relief goals that allow patients to manage their pain and maintain function and quality of life.

Nursing Process and Pain

The nursing process provides you with a systematic approach to understanding and treating a patient's pain. An important aspect of effective pain management is establishing a trusting relationship with the patient and family. Pain management extends beyond pain relief; it encompasses the patient's quality of life and ability to work and play productively, and to function normally within the family and society (Arnstein, 2010).

Your application of the nursing process can be optimized by framing it around readily available clinical pain guidelines, which are based on best evidence and are continuously updated (see the Recommended Web Sites suggestions at the end of this chapter).

◆ Assessment

Pain assessment is the basis of all pain management and pain is often referred to as the fifth vital sign. Monitor the patient's pain consistently along with temperature, pulse, respirations, and blood pressure, especially if the pain is not well controlled. Establishing a nursing diagnosis, deciding on appropriate interventions, and evaluating the patient's response to the interventions are contingent on a timely and accurate pain assessment (Figure 41-4). Effective and unbiased pain assessment is best achieved if you use a validated pain assessment tool appropriate to the patient (McCaffery et al., 2011; RNAO, 2007).

Factors to consider when choosing an assessment tool include the age and developmental stage of the patient, patient condition, type of pain, culture, cognitive ability, preference, and ease of use for both the patient and the nurse (Arnstein, 2010; Wells et al., 2008). Specific tools are available that are appropriate for patients across the lifespan, from preterm neonates to the cognitively impaired elderly. Pain assessment can be as simple as obtaining a pain intensity score on a numerical scale of 0 to 10 or as complex as suggesting that a patient maintain a pain diary that includes pain intensity, pain location, pain descriptors, and the effects of pain on function and

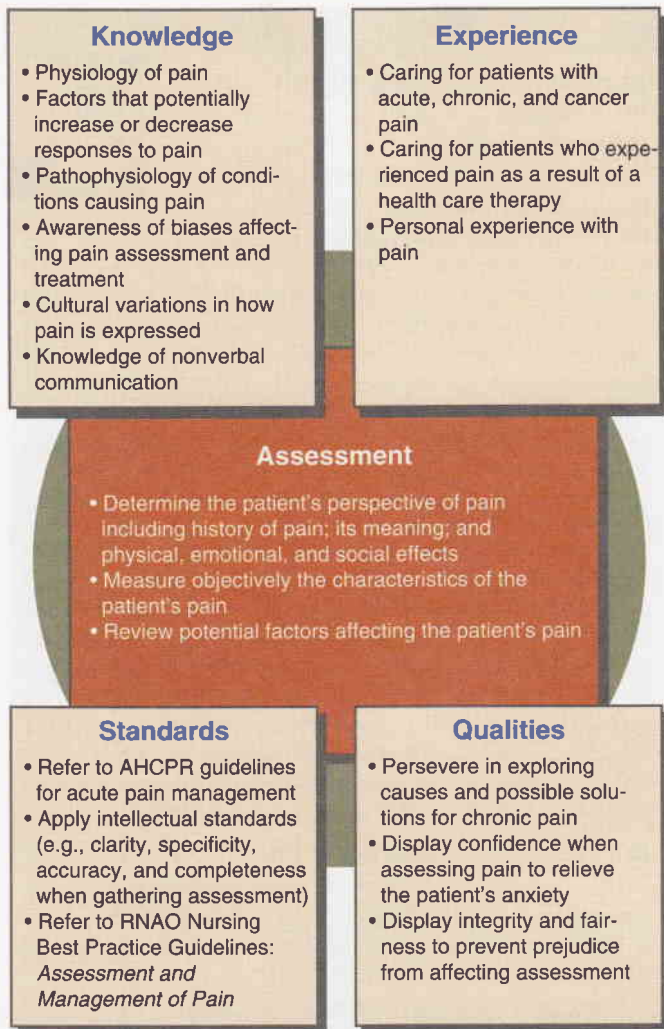


Figure 41-4 Critical thinking model for pain and comfort assessment.

mood. The type of assessment will depend on the needs of the patient.

Establishing a pain goal with your patient will enable you to interpret the pain assessment data that you have collected. You might ask your patient, "What is an acceptable level of pain for you?" The patient might answer that a pain score of 2 (on a scale of 0 to 10, with 0 being no pain and 10 being the worst pain imaginable) is acceptable. You then focus on decreasing the pain to at least that level.

For patients with chronic or complex pain conditions, thorough assessment of pain should include affective, cognitive, and behavioural dimensions of the pain experience as well as a pain history (Institute for Clinical Systems Improvement, 2009). Your assessment of chronic noncancer complex pain should focus on the relationship between pain, function, quality of life, and treatment side effects because complete pain relief may not be possible. In the home setting, family members may assist with pain assessment. The ABCDE approach to pain ensures that you will remember the essential components of effective pain care (Box 41-5).

Failure of clinicians to assess a patient's pain, accept the findings, and treat the report of pain is a common cause of unrelieved pain and suffering (McCaffery et al., 2011). Use the

> BOX 41-5

Routine Clinical Approach to Pain Assessment and Management: ABCDE

- A: Ask about pain regularly. Assess pain systematically.
- B: Believe the patient and family in their report of pain and what relieves it.
- C: Choose pain control options appropriate for the patient, family, and setting.
- D: Deliver interventions in a timely, logical, and safe manner.
- E: Empower patients and their families. Enable them to control their treatment to the greatest extent possible.

From Weissman, D. E., & Dahl, J. L. (1995). Update on the Cancer Pain Role Model Education Program. *Journal of Pain and Symptom Management*, 10(4), 292–297.

right tools and methods to avoid errors, and choose the best pain interventions. Become aware of possible errors in pain assessment (Box 41-6).

Expression of Pain

A patient's self-report of pain is considered the "gold standard" and as such is the single most reliable indicator of the existence and intensity of pain (CPS, 2005; Jovey et al., 2003). Many patients fail to report or discuss pain; at the same time, many nurses believe that patients will report pain. If patients sense that you doubt their pain, they will share little or minimize their report of pain. It is important to establish a caring, therapeutic, trusting relationship that allows open communication about pain.

Patients unable to communicate their pain due to their age, medical condition, language requirements, or cognitive disability require special consideration throughout the pain assessment and treatment process. Choose a self-report or behavioural observation pain assessment tool that is appropriate for age, language, and condition of your patient. Assess and document pain and comfort behaviours before and after pain management interventions to gauge the effectiveness of treatments.

Cognitively impaired patients might require simple assessment approaches involving close observation of behaviour changes, especially with movement. Feldt (2000) designed the Checklist of Nonverbal Pain Indicators (CNPI), which focuses on behaviours for use with cognitively impaired older adults. The Pain Assessment in Advanced Dementia (PAINAD) provides a clinically relevant and easy-to-use pain assessment tool for individuals with advanced dementia (Warden et al., 2003) (Box 41-7).

Characteristics of Pain

Assessment of common pain characteristics will help you to understand the type and pattern of pain and aid in choosing interventions. When you assess pain and when you ask the patient for his or her self-report of pain, it is important to remember that using instruments to quantify the intensity and characteristics of pain depends on having a good fit between the needs of the patient and the attributes of the assessment tool. Developmental level, cognitive ability, language, and culture are a few factors to consider when assessing pain characteristics.

Onset and Duration. Ask questions to determine the onset, duration, and sequence of pain. When did the pain

► BOX 41-6

Possible Sources of Error When Assessing Pain

- Bias, which causes nurses to consistently overestimate or underestimate their patients' pain
- Unclear assessment questions, which lead to unreliable assessment data
- Use of pain assessment tools that have no established reliability or validity
- Expecting self-reports of pain from individuals who cannot rate their pain using a pain scale or who cannot provide a complete verbal account of their pain
- Not considering the pain context and the trajectory or change in an individual's expression of pain over time

begin? How long has it lasted? Does it occur at the same time each day? How often does it recur? Is there frequent breakthrough pain or prolonged pain recovery? Understanding the pattern and cycles of pain will enable you to intervene before the pain occurs or worsens.

Location. To assess location, ask the patient to point to painful areas using their own body as a guide or provide a body outline to record pain. When describing and recording pain location, use anatomical landmarks and descriptive terminology. The statement "The pain is localized in the upper right abdominal quadrant" is more specific than "The patient states that the pain is in the abdomen." Pain, classified by location, may be superficial or cutaneous, deep or visceral, referred, radiating, or neuropathic (Table 41-5). Examples of common pain medications are provided in Table 41-5 and explained elsewhere in this chapter. It is critical that you understand the type of pain the patient has, as pharmacological treatments will vary.

Intensity. Tools that assess pain intensity fall into two categories, self-report or behavioural observation. Examples of self-report scales include the verbal descriptor scale (VDS), the numerical rating scale (NRS), and the visual analogue scale (VAS) (Figure 41-5). When these scales are used to rate pain, a 10 cm or a 0 to 10 numerical baseline is recommended for consistent interpretation of the scores (von Baeyer & Hicks, 2000).

A VDS consists of a line with three- to five-word descriptors equally spaced along the line. The descriptors are ranked from "no pain" to "unbearable pain." Ask the patient to choose the descriptor that best reflects his or her current pain. An NRS has both numbers and descriptors to guide pain assessment. The scale anchors of 0 and 10 include verbal descriptors such as "no pain" and "most pain." The VAS consists of a straight line, representing a continuum of intensity, and has verbal descriptors at each end. Cartoon faces scales are self-report scales that can be used by children as young as 3 or 4 years of age and who do not understand numbers (Stanford et al., 2006). In addition, these scales are often well understood and acceptable to the cognitively impaired elderly (Taylor & Herr, 2003). The Wong-Baker FACES scale consists of six cartoon faces with verbal descriptors depicting increasing amounts of pain. The FACES scale was adapted to provide a culturally sensitive pain assessment tool in Inuktitut for use with Inuit children and adults and is called the Northern Pain Scale (Ellis et al., 2011) (Figure 41-6). The Faces Pain Scale-Revised (FPS-R) is another commonly used self-report scale and is composed of six semirealistic line drawings of pain faces (Bieri et al.,

* BOX 41-7

RESEARCH HIGHLIGHT**Sucrose for Reducing Pain in Infants****Research Focus**

Infants undergo painful procedures during their first year of life. Even healthy infants require blood sampling for newborn screening and receive injections for scheduled childhood immunization. Effective management of pain during these procedures is vital for the well-being of the developing infant. Canadian researchers have contributed substantially to the development of effective pain-management strategies for infants and have demonstrated analgesic effects of sweet-tasting solutions in diverse infant populations (Harrison, Bueno, et al., 2010; Stevens et al., 2010). Using evidence in your practice will help you provide the best care possible to patients of all ages.

**Research Abstract**

The purpose of the systematic review by Harrison and colleagues (Harrison, Stevens, et al., 2010) was to review all published studies of analgesic effects of sweet solutions in infants aged 1 to 12 months to determine if sweet solutions reduced pain during scheduled childhood immunization. Fourteen studies were included in the review. Results were that small volumes of sucrose and glucose, when given to infants to suck before their injections, reduced crying during and following the procedure. They recommended that health care providers use sucrose or glucose in their clinical practice when administering injections or performing other painful procedures on infants.

Evidence-Informed Practice

- Effective management of pain during painful procedures is important to the well-being of infants.
- Small volumes of sucrose or glucose significantly reduce pain during medical procedures in infants up to 1 year of age.
- Sweet solutions need to be given in small doses before and throughout the procedure.
- Use other pain-management strategies in addition to sweet solutions, such as offering the infant a pacifier if this is a normal part of their care.
- Support mothers to help their infants during immunization. For example, support mothers to breastfeed during immunization and to hold their infants securely.

References: Harrison, D., Bueno, M., Yamada, J., Adams-Webber, T., & Stevens, B. (2010). Analgesic effects of sweet tasting solutions in infants: Do we have equipoise yet? *Pediatrics*, 126(5), 894–902. doi:10.1542/peds.2010-1593; Harrison, D., Stevens, B., Bueno, M., Yamada, J., Adams-Webber, T., Beyene, J., & Ohlsson, A. (2010). Efficacy of sweet solutions for analgesia in infants between 1 and 12 months of age: A systematic review. *Archives of Disease in Childhood*, 95(6), 406–413. doi:10.1136/adc.2009.174227; and Stevens, B., Yamada, J., & Ohlsson, A. (2010). Sucrose for analgesia in newborn infants undergoing painful procedures. *Cochrane Database of Systematic Reviews* (Issue 1). Art. No.: CD001069. doi:10.1002/14651858.CD001069.pub3.

1990; McCaffery et al., 2011) (Figure 41-7). Faces pain rating scales are easy for patients to use, easy for the nurse to score, and acceptable to both adults and children. Many of these tools have been translated into different languages and may be duplicated for use in your clinical practice (see Chapter 3 in Pasero & McCaffery, 2011).

If your patient cannot provide a pain intensity rating, choose a behavioural observation tool. These tools prompt you to observe your patient and score typical pain behaviours that sum to a pain intensity score. The Neonatal Infant Pain Scale

► TABLE 41-5 Classification of Pain by Location

Location	Characteristics	Examples of Causes	Examples of Common Medications
Superficial or Cutaneous Pain resulting from stimulation of skin	Pain is localized and of short duration. It is usually a sharp sensation.	Needle stick; small cut or laceration	Topical analgesics and anaesthetics (e.g., EMLA patch for children older than one year of age, Lidoderm patch for cutaneous neuropathic pain in adults)
Deep or Visceral Pain resulting from stimulation of internal organs	Pain is diffuse and may radiate in several directions. Duration varies, but it usually lasts longer than superficial pain. Pain may be sharp, dull, or unique to organ involved.	Crushing sensation (e.g., angina pectoris); burning sensation (e.g., gastric ulcer)	Demerol, morphine
Referred Common phenomenon in visceral pain because many organs themselves have no pain receptors; entrance of sensory neurons from affected organ into same spinal cord segment as neurons from areas where pain is felt; perception of pain is in unaffected areas	Pain is felt in a part of the body separate from the source of pain, and may assume any characteristic.	Myocardial infarction, which may cause referred pain to jaw, left arm, and left shoulder; kidney stones, which may refer pain to groin	Opioids (morphine) for acute MI by physician
Radiating Sensation of pain extending from initial site of injury to another body part	Pain feels as though it travels down or along the body part. It may be intermittent or constant.	Low-back pain from ruptured intravertebral disc, accompanied by pain radiating down leg from sciatic nerve irritation	Temporary treatment with one-time epidural injection of a steroid; injections of anaesthetics (e.g., xylocaine or bupivacaine)
Neuropathic Arises from abnormal or damaged pain nerves as a result of prior injury or disease; certain nerves may continue to send pain messages to brain even though no ongoing tissue damage is present (see Table 41-2)	Pain is usually described as burning, shooting, numbing, or electric-like.	Consequence of disease or prior injury to either the peripheral or central nervous system Complex regional pain syndrome, type I, type II, stroke, spinal cord injury, multiple sclerosis; diabetic neuropathy, alcohol-nutritional neuropathy, and those associated with Guillain-Barré syndrome; nerve root compression, nerve entrapment, trigeminal neuralgia; post-thoracotomy, herniorrhaphy, mastectomy; herpes zoster	Opioids, tricyclic antidepressants (e.g., nortriptyline), anticonvulsants (e.g. gabapentin), lidocaine patch

"Neuropathic" section based on Charlton, E. J. (Ed.). (2005). *Neuropathic pain. Core curriculum for professional education in pain* (pp. 1–8). Seattle, WA: IASP Press.

(NIPS) (Lawrence et al., 1993) and the Premature Infant Pain Profile (Stevens et al., 1996) specifically focus on the pain behaviours of premature and term babies. With the FLACC Postoperative Pain Tool, five categories of behaviour are scored: facial expression (F), leg movement (L), activity (A), cry (C), and consolability (C) (Manworren & Hynan, 2003; Merkel et al., 1997).

A pain scale should be easy for the patient to use and easy for the nurse to score and record in the patient's chart. You should use the same scale for the same patient consistently. Use a pain scale before and after an intervention to gauge the effectiveness of the intervention. A rating of 5 or more on a 0 to 10 scale requires immediate attention. However, a pain intensity score is only one component of best practice pain

care. Box 41-8 describes one nurse's effective solutions in caring for a young patient with burn injuries.

Quality. Another subjective characteristic of pain is its quality, and the descriptors that patients use will vary according to their habits, culture, age, and preference. For example,

some patients may use "hurt" and "ache," for mild pain but reserve the word "pain" for severe discomfort. The patient may describe the pain as crushing, throbbing, sharp, or dull. Certain pain descriptors are typically associated with certain conditions or injuries. For example, patients will often describe pain associated with a myocardial infarction as crushing or vise-like, and the pain of a surgical incision as dull, aching, and throbbing. Neuropathic pain is typically described as burning, shooting, or electric-like (Williams, 2006). The words that patients use to describe their pain will help to determine the type of pain they are experiencing and the treatment.

Pain Pattern. Various factors affect the pain pattern. It is important to assess for factors that precipitate or aggravate pain. Ask the patient to describe activities that cause or increase pain—for example, specific actions such as turning or bending. The low back pain and radiation down the leg associated with a ruptured intravertebral disc are usually aggravated by bending or lifting. Similarly, swallowing and talking typically aggravate the pain of pharyngitis. Asking the patient if the pain is worse at certain times of day, or if it is intermittent, constant, or a combination of both, will help you to plan effective interventions.

Relief Measures. Ask the patient what pain-relief measures he or she uses and which measures are found to be most effective. Patients with chronic, complex pain often have a number of pharmacological and nonpharmacological measures that help relieve pain. Physical and cognitive modalities such as heat or cold, exercise, gentle stretching, massage, acupuncture, imagery, relaxation, distraction, or music are

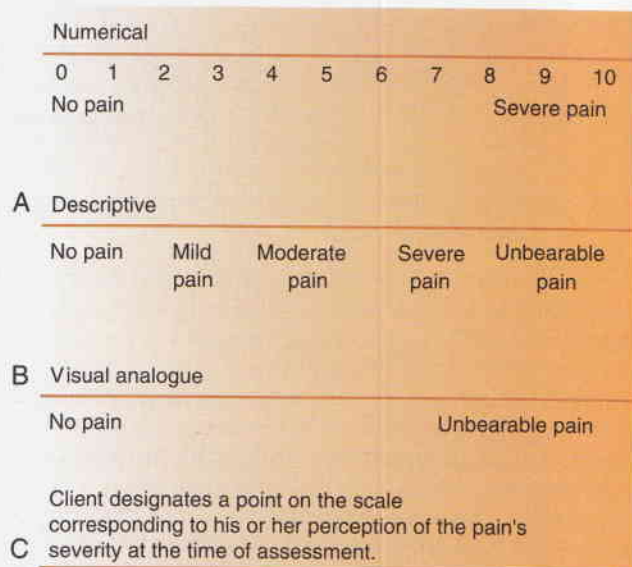


Figure 41-5 Sample pain scales. A, Numerical rating scale. B, Verbal descriptive scale. C, Visual analogue scale.

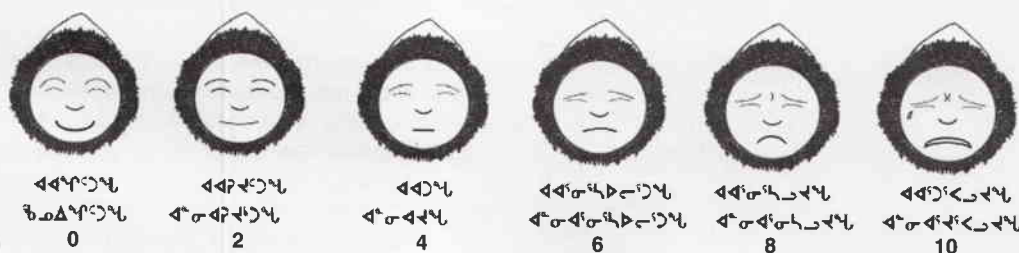


Figure 41-6 Northern Pain Scale **Brief word instructions:** Point to each face using words to describe the pain intensity. Ask the child to choose the face that describes their own pain and record the appropriate number. **Source:** Ellis, J. A., Ootoova, A., Blouin, R., Rowley, B., Taylor, M., DeCourtney, C., Joyce, M., Greenley, W., & Gaboury, I. (2011). Establishing the psychometric properties and preferences for the Northern Pain Scale. *International Journal of Circumpolar Health*, 70(3), 274–285. Ellis/Ootoova is an adapted version of the Wong/Baker FACES Pain Rating Scale from Hockenberry M. J., & Wilson, D.: *Wong's nursing care of infants and children* (8th ed., p. 1876). St Louis, MO: Elsevier Mosby.

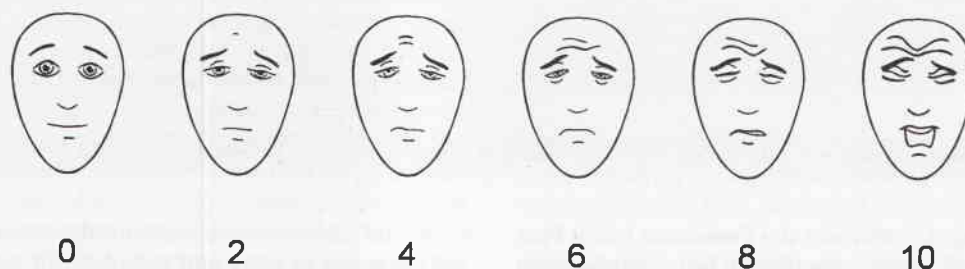


Figure 41-7 The Faces Pain Scale-Revised (FPS-R). **Source:** International Association for the Study of Pain (IASP) © 2001. Hicks, C. L., von Baeyer, C. L., Spafford, P. A., van Korlaar, I., & Goodenough, B. (2001). The Faces Pain Scale-Revised: Toward a common metric in pediatric pain measurement. *Pain*, 93(2), 173–183. Copyright 2001 International Association for the Study of Pain (IASP). Web site: www.painsourcebook.ca.

BOX 41-8 NURSING STORY

I was responsible for caring for 12-year-old Robert, who had extensive burns to both of his legs. His treatment involved daily dressing changes. His family lived in a rural area and was unable to visit their child during his hospitalization.

In my plan of care, I focused on managing Robert's pain. Burn injuries are associated with an intense inflammatory response. The release of chemical mediators that sensitize the active nociceptors at the site of injury cause the wound to become hypersensitized to mechanical stimuli such as touch, rubbing, or wound debridement, as well as to chemical stimuli such as antiseptics or other topical applications. Separation from family, fear of pain, and anxiety increase a child's perception of pain, and pain associated with daily dressing changes can affect how a child handles future painful events. Robert was instructed how to use a numerical 0 to 10 VAS and how to keep a pain diary. The VAS was administered at least every four hours, as well as before and after dressing changes. Based on Robert's pain goal, we aimed for a VAS target of 2 as an indicator of good pain control. This VAS was suitable for assessing pain intensity, was developmentally appropriate, and enabled Robert to provide a self-report of his pain. The pain diary helped us to assess his daily pain in order to adjust pain treatment.

Robert received around-the-clock oral morphine and a titrated bolus of oral morphine to relieve procedural pain before dressing changes. He also received a bolus of lorazepam to reduce anxiety before dressing changes and chose to play an interactive video game during dressing changes. I found that explaining what Robert could anticipate, and giving him the job of helping to remove some of his bandages, increased his involvement and sense of control. I also found that combining pharmacological pain treatment with allowing Robert to play his favourite interactive video game helped to reduce his anxiety during dressing changes. Best evidence suggests that these regimens contribute to the safe and efficacious use of opioids and adjuvants in children with burns.

I continuously monitored the effectiveness and safety of Robert's pain medication in order to assess for oversedation and to prevent breakthrough pain. As part of each pain assessment, I monitored Robert's vital signs, oxygen saturations, and sedation levels with the Pasero Opioid-Induced Sedation Scale (POSS), a reliable and valid sedation scale. I also monitored his fluid intake and urine output to make sure he wasn't becoming dehydrated and to help reduce opioid-related constipation. I checked Robert's temperature, respiration, and blood pressure every four hours for any signs of infection. I listened to his concerns, arranged for a child-life specialist and the teacher to visit Robert, and spoke daily with his family over the phone to discuss his care and progress.

components of a tool kit of pain-relief measures (Henwood & Ellis, 2004). Patients will often know what works best for them, and they appreciate that you are willing to listen and to try their techniques. You should also identify practitioners whose services the patient has used for pain management (e.g., orthopedist, acupuncturist, chiropractor, massage therapist).

Contributing Symptoms. Symptoms such as depression, anxiety, fatigue, nausea, anorexia, sleep disruption, spiritual distress, or guilt may increase suffering and aggravate pain. Assess for pain-associated symptoms and evaluate their effects on the patient's pain perception and pain tolerance. Monitoring and treating these symptoms contributes to effective pain management and improved quality of life.

► BOX 41-9 Behavioural Indicators of Pain**Vocalizations**

Moaning
Crying
Gasping
Grunting

Facial Expressions

Grimacing
Clenched teeth
Wrinkled forehead
Tightly closed or widely opened eyes
Lip biting

Body Movement

Restlessness
Immobilization
Muscle tension
Increased hand and finger movements
Pacing activities
Rhythmic or rubbing motions
Protective movement of body parts

Social Interaction

Avoidance of conversation
Focused only on activities for pain relief
Avoidance of social contacts
Reduced attention span
Despondent—failure to interact purposefully and meaningfully with immediate environment

Effects of Pain. Pain is a physiological, psychological, and psychosocial stressor that negatively affects all aspects of your patient's life. Unrelieved acute pain prolongs hospital stay and delays healing. Poorly controlled procedural pain from needle sticks may lead to "needle phobia" that sets the stage for treatment refusal or delay. Chronic and complex pain can severely challenge your patient's ability to function in all domains (Henwood et al., 2011).

Behavioural Effects. When a patient has pain, assess verbalization, vocal response, facial and body movements, and social interaction. For patients who cannot provide a verbal report of pain (e.g., infants, patients who are unconscious, disoriented, confused, or aphasic, and patients who speak a foreign language), it is important to assess behaviours that are indicative of pain. Grimacing, moaning, crying, inability to settle and rest, poor appetite, and negative emotions such as anger, fear, and anxiety are cues that your patient may be experiencing pain (Box 41-9).

Some nonverbal expressions characterize sources of pain. A person with chest pain often grabs or holds the chest. A person with severe abdominal pain often assumes a fetal position. The nonverbal expression of pain may support or contradict other information about pain. If a woman reports that her labour pains are occurring more frequently and begins to massage her abdomen more frequently, her report is confirmed. If a patient complains of severe abdominal pain but grasps the chest, a more detailed assessment may be necessary. For some patients, vocalizations are culturally acceptable ways to communicate and do not necessarily indicate a higher severity of pain or reduced pain tolerance.

Premature and full-term infants in pain often display characteristic facial actions. The Neonatal Facial Coding System (NFCS) (Grunau & Craig, 1987) is a coding tool for assessing pain-related changes in facial actions, such as brow lowering, eyes squeezing shut, chin quivering, mouth stretching vertically or horizontally, and lip pursing. Some infants, especially extremely preterm infants, may not cry or move in response to a painful stimulus (Stevens, McGrath, et al., 2007). This lack of pain response may also occur in older children and adults. Pain may result in the patient attending to the discomfort and fighting it or to giving in to the discomfort and withdrawing socially.

Influence on Activities of Daily Living. Patients who have daily pain may not be able to carry out routine activities. Inactivity leads to physical deconditioning. The primary goal should be to improve patient function. Ask patients if pain interferes with their sleep, awakens them, or keeps them awake (see Chapter 40). Nonpharmacological or pharmacological pain-management interventions may be needed to aid sleep.

Depending on the location of the pain, the patient may have difficulty performing activities of daily living, including basic hygiene, dressing, and grooming activities. For example, patients with severe arthritis may experience pain when grasping eating utensils or lowering themselves to a toilet seat. Assess the patient's need for assistance with self-care activities, and collaborate with members of the health care team (e.g., occupational therapist). Also, consider the need for family members or friends to assist the patient with basic hygiene.

Pain can affect sexual activity. Fear of worsening pain, arousal, confidence, performance, difficulty finding a comfortable position, and relationship problems are frequently reported pain-related problems (Josefsson & Gard, 2010; Kwan & Roberts, 2005). Prolonged use of opioids for cancer pain may affect sexual function and libido, as can the use of some adjuvant analgesics such as antidepressants (Pasero, Polomano, et al., 2011). Gently explore with your patient pain-related sexual issues and determine his or her preference for information-only and/or individual or group discussion to address these concerns. It is important not to neglect sexual issues when discussing pain. Be cautious that you do not display prejudices in providing sex-stereotyped advice. Assist your patient in locating appropriate self-help material that addresses pain-related sexual functioning (e.g., Lauren Andrew Hebert's book and video entitled *Sex and Back Pain: Advice on Restoring Comfortable Sex Lost to Back Pain*).

Pain also affects the ability of the patient to work. The more physical activity required in a job, the greater the risk of discomfort when the pain is associated with musculoskeletal and certain visceral alterations. Pain may increase if the job is stressful. Inquire about the patient's work, and assess whether pain affects his or her ability to function in the job. Assess the daily chores of homemakers in the same manner. Also assess whether it is necessary for patients to stop activity occasionally because of pain, and then help patients select ways of minimizing or controlling the pain so that they are able to remain productive.

It is also important to include an assessment of the effect of pain on social activities. The pain may be so debilitating that the patient becomes too exhausted to socialize. Identify the patient's normal social activities, the extent to which they have been disrupted, and the patient's desire to participate. Grief over lost goals or unfilled desires may augment pain.

BOX 41-10 NURSING DIAGNOSTIC PROCESS

Assessment Activities	Defining Characteristics	Nursing Diagnosis
Have patient describe pain intensity.	Pain is constant; 5 out of 10	Chronic pain related to chronic physical disability
Assess onset and location of pain.	Present for seven months in lower lumbar area	
Observe patient behaviours.	Grimaces and grunts with movement, rubs flanks frequently; reduced movement	
Assess effect of pain on activities of daily living (ADLs).	Appetite poor; gets little sleep; difficulty dressing	
Review medical history.	Previous trauma; previous exposure to opioids	

Patient Expectations

Patients who seek health care assistance with pain as a major symptom may have experienced the pain for many hours or days. Hospitalized patients may expect and even accept some pain. Asking patients to describe an acceptable pain level is a first step in encouraging them to take control of their pain. Assessing previous pain experiences and effective home interventions provides a foundation on which you can build. Patients expect that nurses will believe their reports of pain and be prompt in meeting their comfort needs.

Nursing Diagnosis

Do not diagnose pain simply because you assume that a patient will have discomfort. You will make an accurate diagnosis only after you have performed a complete assessment. The development of an accurate nursing diagnosis of pain results from thorough data collection and analysis (Box 41-10). Careful assessment, which should include examination of the patient's history for recent procedures or preexisting painful conditions, will reveal the presence of or potential for pain.

The nursing diagnosis focuses on the nature of the pain so that the nurse can identify the best interventions for relieving pain and minimizing its effect on function. Accurate identification of related factors ensures that appropriate nursing interventions will be chosen. For example, *acute pain related to physical trauma* versus *acute pain related to natural low-risk childbirth processes* require very different nursing interventions, such as "monitoring of vital signs for possible shock" versus "controlled breathing techniques." Examples of other diagnoses that may be applicable to patients at risk for pain are the following:

- Anxiety
- Ineffective coping
- Fatigue
- Fear
- Hopelessness
- Impaired physical mobility
- Imbalanced nutrition: less than body requirements
- Acute pain
- Chronic pain
- Powerlessness
- Ineffective role performance
- Self-care deficit
- Chronic low self-esteem
- Situational low self-esteem
- Risk for situational low self-esteem
- Sexual dysfunction
- Disturbed sleep pattern
- Impaired social interaction
- Spiritual distress

❖ Planning

The care plan integrates key patient information, critical thinking elements (Figure 41-8), and professional standards, which

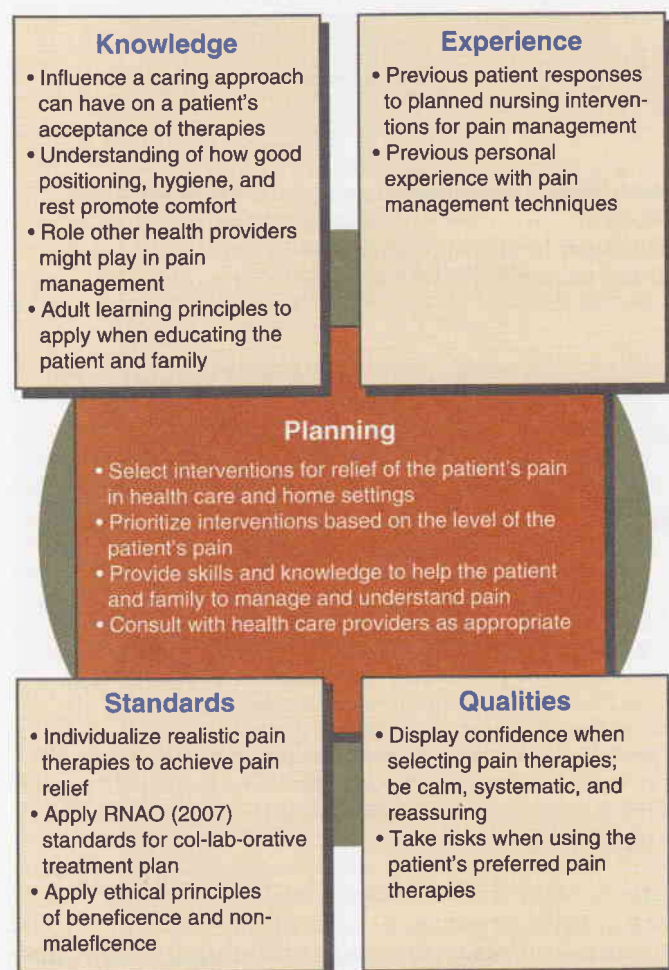


Figure 41-8 Critical thinking model for comfort planning.

provide the best evidence for selecting nursing interventions (Box 41-11). Professional standards of care regarding pain management are available as agency policies or through professional organizations such as the RNAO or the Canadian Pain Society and its affiliated special interest groups. See recommended Web sites at the end of this chapter.

A concept map helps with care planning. Patients in pain frequently have interrelated problems. As one problem worsens, others also change. The concept map shows how nursing diagnoses link to one another and to medical diagnoses. For example, when planning care for the patient with arthritis, the nurse notes the relationships between *acute pain*, *impaired physical mobility*, *self-care*, and *fatigue* (Figure 41-9). Understanding these relationships helps the nurse to develop a holistic and patient-centred care plan.

Goals and Outcomes

Pain management goals permit the patient to function to the best possible extent. Determine with the patient what the pain has prevented the patient from doing and decide on a realistic and acceptable level of pain that will allow a return of function. Success is determined through attainment of goals and positive outcomes. For example, if the goal is “the patient will achieve a satisfactory level of pain relief within 24 hours,” the following are possible outcomes:

- Reporting that pain is a 3 or less on a scale of 0 to 10, or does not interfere with ADL
- Identifying factors that intensify pain, and modifying behaviour accordingly
- Using pain-relief measures safely

Setting Priorities

When setting priorities in pain management, consider the type of pain the patient is experiencing and the effects pain has on various body functions. Discuss the selected interventions appropriate for the nature and effects of the pain with the patient. For example, if a patient has had acute pain but an analgesic has brought relief, focus your attention on how the pain is influencing activity, appetite, and sleep. In contrast, when a patient's pain continues to be severe, immediate pain relief is the obvious priority. Your priorities will change as the patient's pain experience changes. Plans should take into account expected occurrences of pain.

Collaborative Pain Care

A comprehensive plan includes a variety of resources for pain control, including nurse specialists, pharmacists, physiotherapists, occupational therapists, clergy, and child life specialists for pediatric patients. For example, an oncology advanced practice nurse knows the pharmacological and nonpharmacological interventions that work best for chronic cancer pain. Pharmacists are knowledgeable about the effects, interactions, and adverse effects of multiple drug regimes often required to treat pain. Physiotherapists can plan exercises that strengthen muscle groups and lessen pain in affected areas. Occupational therapists can devise splints to support painful body parts. Child life specialists can plan social and play activities that reflect the developmental needs of the child. The family should also be involved in the care plan because they may need to administer care in the home after discharge. If the pain management plan is not successful, you should discuss the need for a change in treatment plan with the physician. Consultation with pain experts may be necessary.

► BOX 41-11 NURSING CARE PLAN

Acute Pain

Assessment

Mrs. Mays was diagnosed with a cancerous tumour in her left lung eight months ago. After treatment, she was taking oral analgesics on a prn basis. She can no longer tolerate taking medications orally and is now hospitalized with uncontrollable chest pain and possible pneumonia. Her husband is with her. A PCA of morphine 0.5 mg on-demand dose with a 10-minute lockout is begun.

Assessment Activities

Ask Mrs. Mays what she did at home to control her pain.

Findings and Defining Characteristics

Her pain escalated from a 3 to a 10, so she doubled her medication and went to bed. This did not help.

Ask Mrs. Mays what her pain intensity is now.

On a scale of 0 to 10, she reports a 9.

Ask Mrs. Mays what her pain has prevented her from doing.

She responds that she is unable to complete her own hygiene activities or sleep well.

Observe Mrs. Mays's nonverbal behaviour.

She is restless and unfocused during the history-taking.

Ask Mrs. Mays her pain intensity goal (out of 10).

She says that a pain intensity of 5 out of 10 would help her function better now. A goal of 3 would be preferred.

Nursing Diagnosis: Acute pain related to a biological injuring agent (tumour).

Planning

Goals (Nursing Outcomes Classification)*

Pain Control

Patient will obtain an acceptable level of comfort as soon as possible.

Expected Outcomes

Patient will report pain at stated goal or below prior to discharge.

Husband will assist in restoring Mrs. Mays to a more comfortable state.

Husband will provide selected comfort measures to Mrs. Mays before bedtime.

Pain: Disruptive Effects

Patient will actively participate in ADLs.

Mrs. Mays will report sleeping for five to six hours without interruption from pain.

She will complete her own hygiene with minimal assistance.

She will walk the hallway with her husband every four hours for 15 minutes.

Medication Response

Mrs. Mays will not experience unmanageable opioid side effects.

Mrs. Mays will report having a normal bowel movement every other day or similar to her baseline routine.

*Outcome classification labels from Moorhead, S., Johnson, M., Maas, M. L., & Swanson, E. (Eds.). (2008). *Nursing outcomes classification (NOC)* (4th ed.). St Louis, MO: Mosby/Elsevier.

Interventions (Nursing Interventions Classification)[†]

Pain Management

Begin PCA at ordered dose. Explain to patient and spouse how to use the PCA. Emphasize the importance of only the patient pushing the button, not the husband.

Rationale

Patient is experiencing an acute episode of her cancer pain. Discouraging the husband from pushing the button will minimize potential oversedating effects of the opioid because patient must be awake to perceive the pain and push the button (Wuhrman et al., 2007).

Monitor IV PCA morphine use. Explain to patient and spouse the action of the medication, potential side effects, and the importance of reporting if the pain is not relieved.

Pain is easier to prevent than to treat. Provide patient and spouse with written instructions regarding the use of the PCA pump. Instruct the husband to inform staff of unrelieved pain or unmanageable side effects (Pasero, Quinn, et al., 2011).

Have patient select nonpharmacological interventions that have relieved pain in the past (e.g., distraction, music, simple relaxation therapy, or massage).

Personal control allows a patient to shape immediate circumstances through his or her own actions. Nonpharmacological interventions augment pharmacological strategies, but should not be used in place of analgesics (Pasero & McCaffery, 2011).

[†]Intervention classification labels from Bulechek, G. M., Butcher, H. K., & McCloskey Dochterman, J. (Eds.). (2008). *Nursing interventions classification (NIC)* (5th ed.). St Louis, MO: Mosby/Elsevier.

BOX 41-11 NURSING CARE PLAN—cont'd

Evaluation

Nursing Actions

Ask Mrs. Mays if she attained her pain-relief goal most of the time.

Observe Mrs. Mays's ability to perform ADLs, walk, and sleep.

Ask Mr. Mays if he was able to give his wife a back massage.

Ask Mrs. Mays the time and consistency of her last bowel movement.

Patient Response and Finding

She responds, "My pain usually runs around a 3, which is my goal, except when I start walking."

She is dressed for breakfast and is walking the hallway every four hours with her husband. The night nurse's notes indicate Mrs. Mays slept through the night.

He reported that she did not want a back rub but preferred to have her feet rubbed, which he was happy to do. "She said it made her feel more relaxed."

She has not had a bowel movement in three days (since starting the morphine PCA).

Achievement of Outcome

Mrs. Mays reports an acceptable level of comfort, which is a change from the level that indicated unacceptable pain. Instruct her to push her button before ambulating.

Ability to perform ADLs and sleep has improved. Continue to monitor.

Nonpharmacological intervention was successful, but the nursing care plan was updated.

Assess her abdomen for bowel sounds and distension. Inquire about passing flatus. As constipation is the most common opioid adverse effect, consult with her physician about starting a stool softener and mild peristaltic stimulant. It is recommended to start these agents as soon as possible (Pasero, Quinn, et al., 2011).

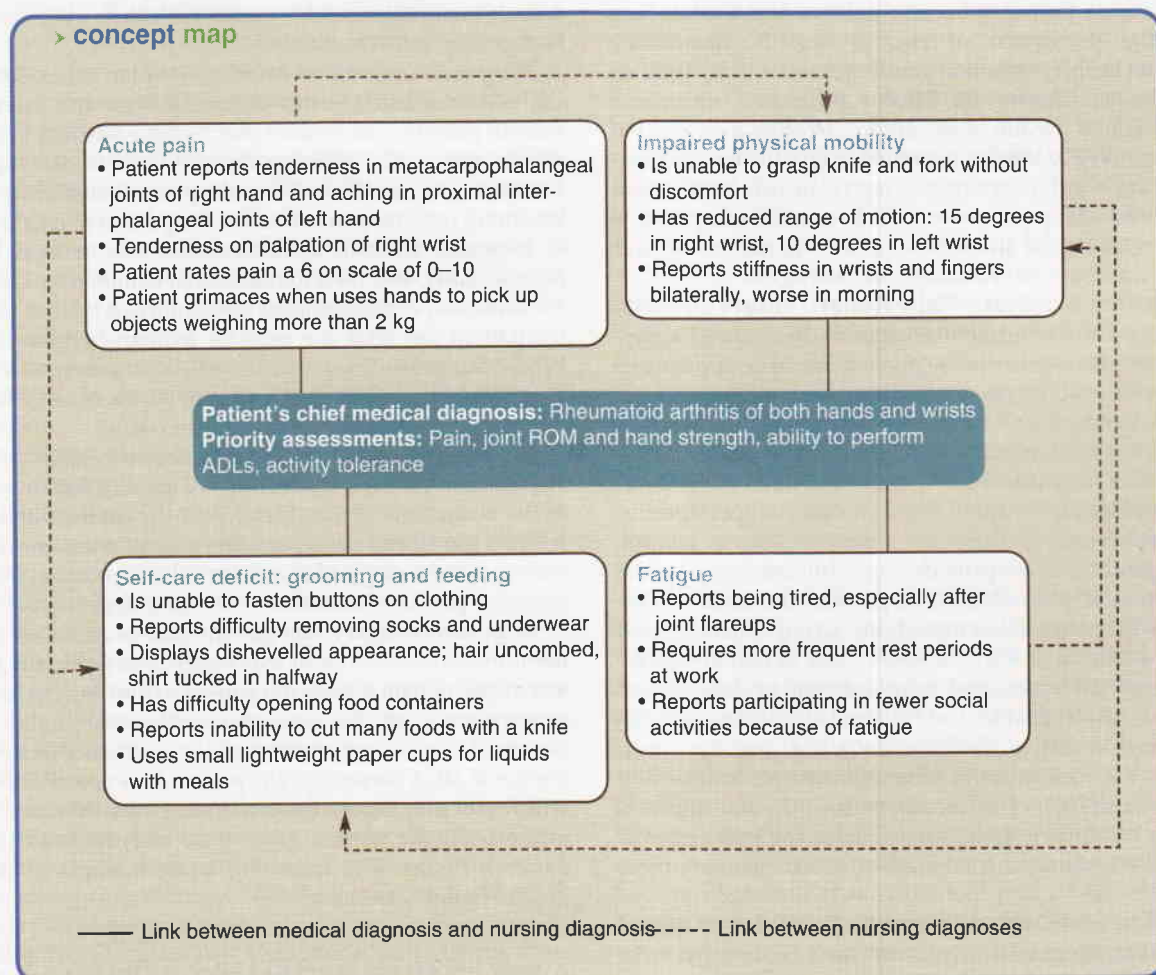


Figure 41-9 Concept map for patient with pain related to rheumatoid arthritis.

Implementation

The nature of the pain and how much it affects well-being determines the choice of interventions. Pain therapy requires an individualized approach, perhaps more so than any other patient problem. You, the patient, and the family must be partners in using pain-control measures. Administer and monitor pain treatments ordered by a physician, but consider using other complementary comfort measures. Patient remedies are often successful, especially when the patient has already had experience with pain. Generally, the least invasive and safest therapy should be tried first.

Health Promotion

The Ottawa Charter for Health Promotion (<https://www.who.int/healthpromotion/conferences/previous/ottawa/en/>) defines health promotion as the process of enabling individuals to gain control over and to improve their health and well-being (World Health Organization [WHO], 2008). Chronic pain and suffering diminish quality of life; thus, relieving pain and promoting self-control become important. Once pain is controlled to an acceptable level, provide patients and their families with education and information about pain so that they can participate in the pain care decision-making process. This will help reduce anxiety and increase a patient's sense of control. For example, patients who are in hospital for the first time may know that they require tests but do not understand them. As a result, they may become anxious and fearful. Fear increases the perception of painful stimuli. Remember, however, that health promotion goes beyond teaching. You can use the Ottawa Charter for Health Promotion document (Canadian Public Health Association, Health and Welfare Canada, and WHO, 1986)—a seminal and still useful document for today's public health practice (Hancock, 2007)—as a framework to develop your own skills in creating a supportive environment, using the strategies of enabling, mediating, and advocating for better pain-management services.

Nonpharmacological Pain-Relief Interventions.

Several nonpharmacological interventions do not need a physician's order but are initiated by nurses. Use these approaches in addition to, not in place of, pharmacological measures (Gruener & Lande, 2006). Nonpharmacological interventions include cognitive-behavioural and physical approaches.

The goals of cognitive-behavioural interventions, such as relaxation and guided imagery, are to change pain perceptions, alter pain behaviour, and provide a greater sense of control. Physical agents aim to provide comfort, correct physical dysfunction, alter physiological responses, and reduce fears associated with pain-related immobility. Complementary and alternative medicine (CAM) therapies, such as herbal supplements, energy therapies, and manipulation or body-based therapies, are also available. The National Center for Complementary and Alternative Medicine (NCCAM) and the Canadian Health Network, a health promotion service operated by the Public Health Agency of Canada, offer up-to-date information on their Web sites to assist you in answering your patients' questions, in a nonjudgemental manner, about the use of these methods.

Relaxation and Guided Imagery. Relaxation is mental and physical freedom from tension or stress. Relaxation techniques provide patients with self-control and can be used at any phase of health or illness. Relaxation techniques include meditation, yoga, Zen, guided imagery, and progressive relaxation exercises (see Chapter 34).

BOX 41-12 Body Positions for Relaxation

Sitting

Sit with entire back resting against back of chair.
Place feet flat on floor.
Keep legs separated.
Hang arms at the side or rest on chair arms.
Keep head aligned with spine.

Lying

Keep legs separated with toes pointed slightly outward.
Rest arms at sides without touching sides of body.
Keep head aligned with spine.
Use thin, small pillow under head.

For effective relaxation, patients must be in a state that will enable them to participate and cooperate. Relaxation is difficult to teach to patients in severe pain because they may not be able to focus and concentrate. The environment should be quiet and free of stimuli. The patient may sit in a comfortable chair or lie in bed (Box 41-12). A light sheet or blanket may help the patient feel more comfortable. Guided imagery and relaxation exercises may be done together or separately.

Progressive relaxation of the entire body takes about 15 minutes. The patient pays attention to the body, noting areas of tension. Warmth and relaxation replace tension in these areas. Some patients relax better with their eyes closed. Soft background music can help.

Progressive relaxation exercises involve controlled breathing exercises and a series of contractions and relaxation of muscle groups. The patient begins by breathing slowly and diaphragmatically, allowing the abdomen to rise slowly and the chest to expand fully. When the patient establishes a regular breathing pattern, you can coach the patient to locate any area of muscular tension, to think about how it feels, to tense muscles fully, and then to relax them completely. This creates the sensation of removing all discomfort and stress. Gradually the patient can relax the muscles without first tensing them. When full relaxation is achieved, pain perception may be lowered and anxiety about pain may decrease. Chapter 34 offers several relaxation exercise approaches.

If a patient becomes agitated or uncomfortable, it is best to stop the exercise. If the patient has difficulty relaxing any part of the body, slow the progression of the exercise and concentrate on the tensed body part. The patient must know that the exercise can be stopped at any time. With practice, the patient can soon perform relaxation exercises independently.

In **guided imagery**, the patient creates an image in his or her mind, concentrates on that image, and gradually becomes less aware of pain. Coach the patient in forming the image and concentrating on the sensory experience. Initially, ask the patient to think of a pleasant scene or experience that promotes the use of all of the senses. The patient may describe the image, which you may record for use during later exercises. Use the information the patient gives you, and do not change the patient's image. The following is an example of part of a guided imagery exercise:

Imagine you are lying on a cool bed of grass with the sounds of rushing water from a nearby stream. It's a balmy day. You turn to see a patch of blue wildflowers in bloom and can smell their fragrance.

Sit close enough to be heard, and speak in a calm, soft voice. While relaxing, the patient focuses on the image, and it will

become unnecessary for you to speak continuously. If the patient shows signs of agitation, restlessness, or discomfort, stop the exercise and try again when the patient is more at ease.

Distraction. The reticular activating system inhibits painful stimuli if a person receives sufficient or excessive sensory input. Boredom or isolation may cause patients to focus on their pain and thus perceive it more acutely. Pleasurable stimuli cause the release of endorphins that help a person ignore or become unaware of pain. Distraction, particularly effective for young children, directs attention to something else, thus reducing pain awareness and increasing tolerance. It works best for short, intense pain lasting a few minutes, such as a needle-stick or intravenous insertion. Examples are praying, describing photos or pictures aloud, listening to music, using therapeutic humour, and playing games, some involving the use of virtual reality technology (Dahlquist et al., 2009). Most distractions can be used in a hospital, home, or long-term care facility.

Music. Music can promote relaxation and decrease physiological pain, stress, and anxiety by diverting attention away from pain. Music can be chosen by either the patient or health care provider. Help create a relaxing setting so that music can be listened to uninterrupted. The use of earphones may assist with concentration and block out ambient noise. Although some benefits can be achieved with music therapy, the evidence is weak to moderate with regards to effects of music therapy on reduction of acute pain (Wells et al., 2008).

Biofeedback. Biofeedback is a behavioural therapy that involves giving individuals information about physiological responses (e.g., blood pressure or tension) and ways to exercise voluntary control over those responses (Rakel & Faass, 2006). It is used to produce deep relaxation and may be effective for regional pain syndrome management (Bruehl & Chung, 2006) and migraine headaches (Damen et al., 2006). In the treatment of headaches, electrodes are attached externally over each temple. The electrodes measure skin tension in microvolts. A polygraph machine visibly records the tension level for the patient to see. The patient learns to achieve optimal relaxation by lowering the actual level of tension experienced, using feedback from the polygraph. The therapy takes several weeks to learn. Chapter 34 describes the benefits and limitations of biofeedback.

Acupuncture. Acupuncture, traditionally embedded in naturalistic theories, may help reduce chronic and acute pain (Chou & Huffman, 2007) and, if properly performed, is a safe procedure. Acupuncture involves the insertion of acupuncture needles into specific “acupuncture points” (acupoints) on the patient’s body followed by the twisting of the needle up and down by hand. Evidence from numerous systematic reviews indicates that acupuncture is potentially effective for emesis developing after surgery or chemotherapy in adults, for nausea associated with pregnancy, and for relieving dental pain. During the last decades, our understanding of how acupuncture analgesia works has undergone considerable development. Acupuncture activates endogenous opioid mechanisms and may stimulate gene expression of neuropeptides (Zhao, 2008). The training and provision of acupuncture care in Canada is rapidly expanding. Chapter 34 describes the benefits and limitations of acupuncture.

Cutaneous Stimulation. Cutaneous stimulation, also referred to as touch healing (TH) therapies, is the stimulation of the skin to relieve pain. A massage, warm bath, ice bag, and transcutaneous electrical nerve stimulation (TENS) are simple ways to reduce pain perception. How cutaneous

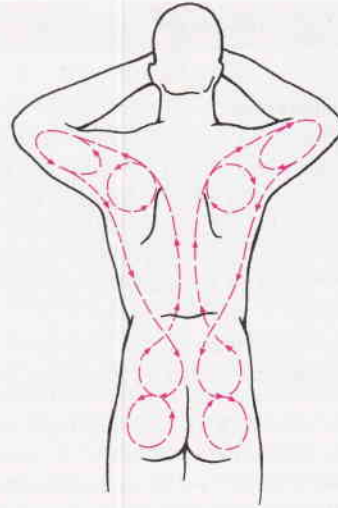


Figure 41-10 Back massage pattern.

stimulation works is unclear. It has been suggested that TH therapies involve mechanisms of neural plasticity in somato-sensory maps, thus resulting in sensory reorganization (Kerr et al., 2007).

An advantage to cutaneous stimulation is that the measures can be used in the home, giving patients and families some control over pain symptoms and treatment. The proper use of cutaneous stimulation can reduce pain perception and help reduce muscle tension that might otherwise increase pain. Help the patient to get into a comfortable position, and explain the purpose of the therapy. Cutaneous stimulation should not be used directly on sensitive skin areas (e.g., burns, bruises, skin rashes, inflammation, underlying bone fractures).

Massage is a safe and effective way to reduce anxiety and minimize tension (Figure 41-10). Massage involves the manipulation of the soft tissues by either mechanical or physical means. Recent literature suggests that hand and foot massage can be an option, along with back or body massage. The recommended duration of massage is 5 to 20 minutes (Wells et al., 2008). Massages communicate caring and are easy for family members or health care providers to learn (Box 41-13).

Therapeutic touch (TT) and **Reiki** are classified as biofield, training-specific therapies, the medical use of subtle energy fields in and around the body for positive health effects. TT and Reiki involve the practitioner’s use of hands to help strengthen the body’s ability to heal. TT was developed in the 1970s by a nurse, Dr. Dolores Krieger (1979), and Reiki is an ancient practice believed to have originated thousands of years ago (Vitale, 2007). In recent years, nursing has been instrumental in exploring the benefits of energy work. Although there is still a lack of empirically based investigations to support these practices, nurses and others have been reporting clinical observations that the use of TT and Reiki has relaxation effects and stress management benefits, lessens pain, and promotes inner healing (Aghabati et al., 2010; Lee et al., 2008; Vitaler, 2007). Energy work has been endorsed as a valid modality for nursing intervention by a number of nursing groups across Canada, such as the Canadian Holistic Nursing Association and the Registered Nurses of Ontario’s Complementary Therapies Nurses’ Interest Group. You are encouraged to refer to Chapter 34 for additional information.

► BOX 41-13 Procedural Guideline

Massage

Delegation Considerations:

The nurse is responsible for assessing contraindications and patient response to massage. Administering a massage may be delegated to an unregulated care provider (UCP), providing that the patient is stable. Before delegation, you must do the following:

- Instruct the UCP about which body parts to massage.
- Instruct the UCP about the importance of not massaging reddened skin areas.
- Clarify the early signs of impaired skin integrity for select patients, and instruct the UCP to report changes in the patient's skin.

Equipment:

- Moisturizing lotion
- Bath towel or blanket

Procedure:

1. Assist patient to assume comfortable position.
2. Dim room lights, turn on soft music, or both, according to patient preference.
3. Perform hand hygiene. Warm lotion in hands or place container in warm water.
4. Adjust or remove patient's bed clothing.
5. Place small amount of lotion in your hands.
6. Massage each body part for at least 10 minutes.
 - A. *Back*: Begin a sacral area massage with a circular motion (see Figure 41-10), moving upward from buttocks to shoulders. Use a firm, smooth stroke over the scapula. Continue in one smooth stroke to upper arms and laterally along sides of back, down to iliac crests. Use long, gliding strokes along muscles of spine. Knead any muscles that feel tense or tight. Knead skin by gently grasping tissue between thumb and fingers. Knead upward along one side of the spine from buttocks to shoulders, around nape of neck. Knead or stroke downward toward sacrum. Repeat along other side of back.
 - B. *Neck*: Support neck at the hairline with one hand and massage upward with a gliding stroke. Knead muscles on one side. Switch hands to support neck, and knead other side. Stretch the neck slightly, with one hand at the top and the other at the bottom.
 - C. *Arms*: Use a gliding stroke to massage upwards from patient's wrist or forearm. With thumb and forefinger of both hands, knead muscles from forearm to shoulder. Continue kneading bicep, deltoid, and triceps muscles. Finish with gliding strokes from wrists to shoulder.
 - D. *Hands*: Slowly open patient's palm, and glide fingers over the palmar surface. Use thumbs to apply friction to palm and move thumbs in a circular motion. Stretch the palm outward. Massage each finger, using a corkscrew-like motion from the base of the finger to the tip. Gently knead each muscle in patient's fingers. Glide hands smoothly from fingertips to wrists. Repeat for other hand.
 - E. *Feet*: Gently massage top and bottom of each foot. Using gliding motion, massage from heel to toe. Gently massage the dorsal surface of the foot and each toe. Repeat for other foot.
7. Wipe excess lotion off patient's back, neck, or extremity. If necessary, assist patient to dress and resume a comfortable position.
8. Ask patient about level of comfort. Note any areas of muscle pain or tension.

Cold and heat applications relieve pain and promote healing. The choice of heat or cold varies with patients' condition and preference. Application of either method may require a physician's order (Wells et al., 2008). Moist heat can help relieve pain from a tension headache, and cold applications can reduce acute pain from inflamed joints. To avoid injury, check the temperature and avoid direct application of cold or heat to the skin. Patients at most risk for injury include those with spinal cord or other neurological injury, older adults, and confused patients.

Application of cold packs may be particularly effective for pain relief in certain conditions. Cold is particularly effective for dental pain and has been used effectively to relieve pain associated with coughing and breathing in postcardiac surgery (Chaillier et al., 2010). Cold applications are also effective before needle-stick procedures. Cold may be applied either near or distal to the pain site. The cold should be applied for 20 minutes to achieve maximum effect. Application near the actual site of pain tends to provide the most relief.

Heat application is another option. Heating pads or hot water bottles may be used. Commercial pillows that can be warmed in the microwave and that contour to the body can also be used. Although heat and cold applications are methods to consider when promoting comfort, few studies have been published regarding their impact on pain or functional qualities (Wells et al., 2008). Refer to Perry and Potter's (2010) textbook *Nursing Skills and Techniques* (7th edition) for further guidance on the performance of warm and cold therapy applications and the necessary safety precautions for use.

Another form of cutaneous stimulation, sometimes called counterstimulation, is **transcutaneous electrical nerve stimulation (TENS)**. TENS involves stimulation of the skin with a mild electrical current passed through external electrodes (Melzack & Wall, 2003). This therapy requires a physician's order. The TENS unit consists of a battery-powered transmitter, lead wires, and electrodes. The electrodes are placed directly over or near the pain site. Hair or skin preparations should be removed before attaching the electrodes. When a patient feels pain, the transmitter is turned on and a buzzing or tingling sensation is created. The patient may adjust the intensity and quality of skin stimulation. The tingling sensation can be applied until pain relief occurs. TENS may be effective for postsurgical pain control and reduction of pain caused by postoperative procedures. Consider consulting physiotherapy for TENS assessment and application.

Herbal Supplements. Herbal supplements have not been sufficiently studied to be recommended for pain relief; however, many patients self-medicate using supplements such as echinacea, ginseng, ginkgo biloba, and garlic supplements (Wirth et al., 2005). Some herbal products may interact with prescribed analgesics; in particular, ginkgo biloba may decrease the ability of blood to clot after surgery. Ask the patient to report all substances taken to relieve pain (Yoon & Schaffer, 2006) (see Chapter 34).

Reducing Pain Perception. One simple way to promote comfort is to remove or prevent painful stimuli (Box 41-14). Take steps to reduce patients' pain by paying attention to the way you perform procedures. This is especially important for patients who are immobilized or have difficulty in expressing themselves. Consider a patient's condition and the aspects of the procedure that are uncomfortable. Use techniques to avoid pain-producing situations. For example, in a patient with severe arthritic knee pain, know that extreme flexion of

► BOX 41-14

Controlling Painful Stimuli in the Patient's Environment

- Tighten and smooth wrinkled bed linen.
- Loosen constricting bandages (unless specifically applied as a pressure dressing).
- Change wet dressings and linens.
- Position patient in correct anatomical alignment.
- Check temperature of hot or cold applications, including bath water.
- Lift patient in bed—do not pull.
- Position patient correctly on bedpan.
- Avoid exposing skin or mucous membranes to irritants (e.g., urine, stool, wound drainage).
- Prevent urinary retention by keeping Foley catheters patent and free flowing.
- Prevent constipation with stool softeners, fluids, diet, and exercise.
- Reduce lighting and ambient sound.

the knee can cause pain. Before walking the patient to the bathroom, make sure that an elevated toilet seat is available. The patient can then be seated and can rise with minimal discomfort.

Acute Care

Acute Pain Management. Some patients have acute pain from invasive procedures (e.g., surgery or endoscopy), trauma, or cancer. The key to pain relief's success is the ongoing evaluation of interventions. Ask yourself the following questions: Is relief obtained? Do the medications cause any unacceptable side effects? It is the responsibility of the health care team to collaborate in order to find the combination of therapy that works best for the patient.

Pharmacological Pain-Relief Interventions. The ideal analgesic has yet to be developed, but many opioid and nonopioid pain-relieving medications are available. Most require a physician's order.

safety alert Your critical thinking and judgement in the selection and administration of analgesics helps to ensure safe and effective pain relief.

- Be cognizant of the pain diagnosis, the patient's physical characteristics (e.g., age), and severity of the illness; know that some analgesics will be contraindicated.
- Employ the 10 rights (person, drug, dose, route, time, documentation, reason, evaluation, patient education, and right to refuse) of medication administration.
- When dispensing opioids, be sure to check the dose and drug type, as the names of some common medications sound alike.
- Administer all analgesics using standardized guidelines.
- Evaluate analgesic effectiveness, and report and document any adverse effects.

Analgesics. Analgesics are a common and effective method of pain relief. Although analgesics can effectively relieve pain, nurses and physicians still tend to undertreat patients' pain.

Three types of analgesics exist: (1) nonsteroidal anti-inflammatory drugs (NSAIDs) and nonopioids, (2) **opioids**, and (3) coanalgesics, a variety of medications that enhance analgesics or have analgesic properties.

Acetaminophen (Tylenol) has no anti-inflammatory effects and works peripherally and centrally, but its action is unknown.

Its major adverse effect is hepatotoxicity. It is in a variety of over-the-counter (OTC) cold, flu, and allergy remedies. The maximum 24-hour dose for an adult is 4 g (the same dose limitation as aspirin) and is weight-dependent for infants and children. Acetaminophen does not affect platelet function and has minimal impact on the gastrointestinal tract (Arnstein, 2010). For postoperative, or severe, pain, it is often combined with opioids (e.g., Percocet, Vicodin, Lortab, and Ultracet) because it reduces the dose of opioid needed to achieve successful pain control. An overdose of acetaminophen can be fatal and is treated with acetylcysteine (Mucomyst).

Nonselective NSAIDs, such as aspirin and ibuprofen, provide relief for mild to moderate acute pain resulting from trauma or an inflammatory process (Arnstein, 2010). NSAIDs are believed to act by inhibiting the synthesis of prostaglandins (Pasero, Portenoy, & McCaffery, 2011) and thus the cellular responses to inflammation. Most NSAIDs act on peripheral nerve receptors to reduce transmission of pain stimuli. Unlike opioids, NSAIDs do not depress the central nervous system, nor do they interfere with bowel or bladder function (Pasero, Portenoy, & McCaffery, 2011). Chronic NSAID use in the older patient, however, is associated with more frequent adverse effects (e.g., gastrointestinal bleeding and renal insufficiency) and should be avoided (Arnstein, 2010). Taking NSAIDs with food reduces the likelihood of GI upset (Arnstein, 2010).

Nonselective NSAIDs have been found to be safe when taken for short periods of time. Celebrex is the only selective COX-2 inhibitor currently available; however, it should not be used in patients with a sulfa allergy. Some patients with asthma or an allergy to aspirin are also allergic to NSAIDs (Pasero, Portenoy, & McCaffery, 2011). Some NSAIDs are available OTC; advise patients to discuss using OTC NSAIDs for managing pain with their primary health provider (D'Arcy, 2006).

Codeine is a weak opioid used for moderate to severe pain. Although codeine has been widely prescribed for pain relief, recent advances in our understanding of the pharmacogenetics of codeine have forced a more rigorous investigation of its properties and adverse effects, particularly in the pediatric age group. Codeine is a prodrug. A prodrug is an opiod that must undergo chemical conversion to morphine to have an analgesic effect. Codeine's pharmacokinetics are variable and, in some patients, unpredictable.

Genetic variations exist that affect how the isoenzyme CYP2D6 converts codeine to morphine. Some patients may be ultrafast metabolizers, rapidly converting codeine to morphine. This places them at risk for oversedation and respiratory depression that could result in death. One case report details the death of a breastfed infant who died after receiving breast milk from a mother who had been prescribed codeine postpartum (Madadi et al., 2006). Two other young children died when they received codeine following a routine tonsillectomy procedure (MacDonald & MacLeod, 2010). Guidelines for infants, young children, and breastfeeding mothers should be modified until further research can be undertaken to better understand codeine and alternative pharmacological agents used (MacDonald & MacLeod). Alternative pharmacological agents should be used.

Opioid or opioid-like analgesics are generally prescribed for moderate to severe pain. These analgesics act by binding with opiate receptors to modify the perception of pain. An uncommon but potentially fatal adverse effect of opioids is oversedation and respiratory depression (Pasero, Quinn, et al., 2011). Respiratory depression caused by opioids can be

prevented using careful titration of opioids, close monitoring of sedation scores, and a thorough respiratory assessment including the depth, quality, and regularity of the respirations (Pasero, Quinn, et al., 2011).

If a patient experiences respiratory depression, an opioid antagonist such as naloxone can be administered. The dose must be titrated carefully and given as per physician order. Administering naloxone too quickly or administering too much can reverse the analgesic effect and produce severe pain that may be difficult to control. In addition, rapid administration can increase the sympathetic response and the patient may experience tachycardia, dysrhythmias, hypertension, pulmonary edema, and even cardiac arrest (Pasero, Quinn, et al., 2011). You need to carefully assess and reassess patients every 15 minutes for 2 hours after drug administration because of the risk of renarcotization and the return of respiratory depression. Naloxone is also used in smaller doses (1–2 mcg/kg IV) for the treatment of pruritus (Brislin & Rose, 2005).

Common adverse effects of opioids include nausea, vomiting, constipation, sedation, pruritus, and confusion. Less common effects include urinary retention, dry mouth, sweating, orthostatic hypotension, and seizures (Pasero, Quinn, et al., 2011). Most adverse effects are dose related; hence, a reduction in the opioid dose may treat the adverse effect or allow it to be more tolerable (Pasero, Quinn, et al., 2011).

Around-the-clock (ATC) dosing should be considered when pain exists for 12 out of 24 hours (Pasero, Quinn, et al., 2011). The benefits of ATC dosing include prevention in delay of timely medication administration and avoidance of the peaks and valleys of pain and analgesic blood levels associated with as-needed (prn) regimens.

As-needed dosing (prn) can be utilized to treat breakthrough pain; however, this method requires the patient's participation as he or she needs to request analgesia. Undertreatment of pain can occur if prn dosing is used for continuous pain. As-needed dosing is most useful when initiating opioid therapy to treat moderate to severe escalating pain or when pain is diminishing (Pasero, Quinn, et al., 2011).

The proper use of analgesics requires careful assessment and critical thinking in the application of pharmacological principles and logic. A patient's response to an analgesic is highly individualized. An NSAID can be as effective as or more effective than an opioid for some patients if the pain is caused by inflammation. An orally administered analgesic usually has a longer onset and duration of action than an injectable form. In addition, controlled- or extended-release opioid formulations (MS Contin, OxyContin, Kadian, Avinza, and methadone) are available for administration every 8 to 12 hours ATC. Physicians should not order these long-acting formulations on an as-needed basis.

It is essential that you know the comparative potencies of analgesics in both oral and injectable forms. In addition, know the route of administration most effective for a patient so that you can achieve controlled, sustained pain relief. If nurses on different shifts choose alternative routes for the same doses, the patient will not receive the same level of analgesia, and pain control will be poor. Equianalgesic charts are charts that convert one opioid to another (e.g., morphine to hydromorphone), or parenteral forms of opioids to oral forms (or vice versa). They are available on most nursing units or by contacting pharmacy team members. To see an example of an equianalgesic chart and pocket tool developed by the Massachusetts Pain Initiative in partnership with the

American Cancer Society, visit <http://masspaininitiative.org/files/PocketTool2008.pdf>.

Before administering opioids, it is important to consider the patient's situation, including current treatments, diseases and conditions, and organ (kidney and liver) function. Opioid doses often need adjusting according to patient circumstances. Situations requiring special considerations include opioid-naïve patients, breastfeeding mothers, patients on dialysis, those with neurological or respiratory conditions, and patients with recent abdominal surgery.

Adjuvants, or coanalgesics, are drugs that were originally developed to treat conditions other than pain but have been shown to have analgesic properties. Adjuvants, used for acute or chronic pain, can be employed as additional therapies or as a primary therapy for some specific painful conditions. Classes of drugs considered as adjuvant therapy include the following: anticonvulsants, such as gabapentin for neuropathic pain; antidepressants for neuropathic pain; corticosteroids; α_2 -adrenergic agonists, such as clonidine; cannabinoids; and topical analgesics (Pasero, Polomano, et al., 2011).

Patient-Controlled Analgesia. Patients benefit from having control over pain therapy. When patients depend on nurses for prn analgesia, an erratic cycle of alternating pain and analgesia often occurs. The patient feels pain and asks for medication, but the nurse must first assess the patient and then prepare the medication. Within an hour, analgesia finally occurs, but adequate pain relief may last only 30 to 60 minutes. The patient's discomfort then gradually escalates, and the cycle is repeated.

A drug delivery system called **patient-controlled analgesia (PCA)** is a safe method for pain management that allows patients to self-administer opioid doses (e.g., morphine, hydromorphone, fentanyl) on demand with minimal risk of overdose. PCA allows patients to "control" when they request analgesia and avoids the delay in waiting for pain relief. The goal is to maintain a constant plasma level of analgesic so that the problems of prn dosing are avoided. Systemic PCA typically pertains to IV administration, but PCA devices are also used to deliver pain medication via subcutaneous, epidural, intrathecal, and transdermal routes (Pasero, Quinn, et al., 2011). PCAs are portable computerized infusion pumps containing a chamber for a syringe (Figure 41-11) or bag that delivers a small, preset dose of medication. To receive a bolus dose, the patient activates a button attached to the PCA pump. To minimize overdoses, the system is designed with a preset "loc-out" interval, typically 5, 10, or 15 minutes. The system is designed to deliver a specified number of doses every hour. PCA can be ordered with bolus doses alone or bolus doses plus a continuous infusion (Pasero, Quinn, et al., 2011). PCA dosing is based on weight.

safety alert Remember to perform an independent double check with a qualified nurse colleague to ensure the medication and the pump settings (e.g., basal rate, bolus dose, loading dose, and lockout interval) are the same as ordered by the physician, and the same as indicated on the pain-management flow sheet and on the medication administration record.

PCA use is beneficial in many ways. The patient gains control over his or her pain, and pain relief does not depend on nurse availability. Patients can also access medication when they need it. This can decrease anxiety and lead to decreased



Figure 41-11 A, Patient-controlled analgesia (PCA) pump with syringe chamber. B, Patient learns to use PCA pump.
Source: Perry, A. G., & Potter, P. A. (2010). *Clinical nursing skills and techniques* (7th ed., pp. 382–383). St Louis, MO: Mosby.

BOX 41-15

Preparation for Patient-Controlled Analgesia (PCA)



Objectives

- Patient will be able to explain the purpose of PCA in managing pain.
- Patient will use the PCA device correctly.
- Patient will achieve pain control.

Teaching Strategies

- Teach the use of PCA before it is needed so that patients can understand how to use it after awakening from anaesthesia or sedation. Reinforce as needed.
- Instruct patient on the purpose of PCA, emphasizing that the patient controls medication delivery.
- Explain that the lockout interval prevents the risk of overdose.
- Tell family members or friends that they should not operate the PCA device for the patient.
- Ask the patient to demonstrate use of the PCA delivery button.

Evaluation

- Ask patient to tell you the purpose of the PCA device.
- Observe the patient administering a dose.
- Evaluate the severity of the patient's pain 15 to 20 minutes after use of the PCA device.

medication use. Small doses of medications are delivered at short intervals, stabilizing serum drug concentrations for sustained pain relief.

Patients who do not favour PCA are those who feel they do not understand how to use the technology, while nurses view PCA as a disadvantage when it is ordered for patients with short-term memory loss or states of confusion (King & Walsh, 2007). Patient suitability, preparation, and teaching are, therefore, critical to the safe and effective use of PCA devices (Box 41-15). Teach patients how to use the technology and determine if they are physically able to locate and press the button to deliver the dose. Remind family members they must not press the button for patients, as this is deemed unauthorized administration of a dose by another person. The latter is referred to as PCA by proxy. Check to ensure your institution has established a policy that safeguards against PCA by proxy (Pasero, Quinn, et al., 2011).

Check the IV line and PCA device regularly to ensure proper functioning. Errors in pump programming can occur

that put the patient at risk for an overdose, resulting in oversedation and respiratory depression. In addition, opioid-naïve patients should be monitored carefully for both these adverse effects at the initiation of PCA therapy (Pasero, Quinn, et al., 2011).

The first mechanical device for oral medications, Medication on Demand (MOD), recently became available. This device allows patients access to their own oral prn medications, including opioids and other analgesics, anti-emetics, and anxiolytics, at the bedside. Research has shown this system is satisfying to patients and no reports of medication loss or inappropriate use (Rosati et al., 2007).

Local Analgesic Infusion Pump. Postoperatively, such as following cardiac (White et al., 2003) and orthopedic surgeries (Liu et al., 2006), an infusion of a local anaesthetic into the operative site may be effective for pain management and help to avoid systemic adverse effects of oral or intravenous analgesics. A catheter from the wound, placed during surgery, is connected to a pump containing a local anaesthetic, such as Marcaine. The infusion is usually left in place for 48 hours and may be set to either demand or continuous modes. Oral analgesics may still be needed by the patient, but the total dose is often reduced.

Topical Analgesics and Anaesthetics. Topical analgesics such as ELA-Max/LMX and EMLA (eutectic mixture of local anaesthetics) are available for both children and adults (Eidelman et al., 2005). Apply EMLA to the skin, via a disc or as thick cream, 30 to 60 minutes before minor procedures (e.g., IV start) or anaesthetic infiltration of soft tissue. Do not place EMLA around the eyes, on the tympanic membrane, or over large skin surfaces. The Lidoderm patch is a topical analgesic effective for cutaneous neuropathic pain in adults. Place three patches, cut to size, on and around the pain site using a 12-hour-on, 12-hour-off schedule to avoid lidocaine toxicity. Other topical analgesics include ketoprofen patches and capsaicin lotion (Pasero, Polomano, et al., 2011).

Sucrose. Oral sucrose is an effective strategy to reduce pain during procedures in infants (Harrison, Stevens, et al., 2010). Sweet taste is thought to trigger a release of endogenous opioids. Small volumes of sucrose are required, given in small doses throughout the duration of the painful procedure. Non-nutritive sucking such as the use of a pacifier may further assist with pain management. The efficacy of sucrose has been well demonstrated in infants undergoing painful procedures; however, further studies are required to determine efficacy in young children (Stevens et al., 2010).

Local and Regional Anaesthetics and Analgesics. **Local anaesthesia** is the infiltration of a local anaesthetic medication to induce loss of sensation to a localized body part. Physicians use local anaesthesia during brief surgical procedures, such as the removal of a skin lesion or suturing a wound. The local anaesthetic is topically applied on skin and mucous membranes, or injected subcutaneously or intradermally to anaesthetize a body part. The drugs produce temporary loss of sensation by inhibiting nerve conduction. Local anaesthetics can also block motor and autonomic functions, depending on the amount used and the location and depth of an injection. Smaller sensory nerve fibres are more sensitive to local anaesthetics than are large motor fibres. As a result, the patient loses sensation before losing motor function, and, conversely, motor activity returns before sensation.

Local anaesthetics can cause side effects, depending on their absorption into the circulation. Itching or burning of the skin or a localized rash is common after topical applications. Application to vascular mucous membranes increases the chance of systemic effects, such as a change in heart rate.

Regional anaesthesia is the injection of a local anaesthetic to block a group of sensory nerve fibres. Tissues are anaesthetized layer by layer, as the surgeon or anaesthesiologist introduces the agent into deeper structures of the body. Some types of regional anaesthesia are epidural anaesthesia, pudendal blocks, and spinal anaesthesia.

Whereas epidural anaesthesia induces temporary loss of sensation, **epidural analgesia** permits control or reduction of severe pain without the more serious sedative effects of parenteral or oral narcotics. Epidural analgesia is commonly used for the treatment of acute postoperative pain, labour and delivery pain, and chronic pain, especially when associated with cancer (Roman & Cabaj, 2005). Epidural catheters can be placed via the caudal, lumbar, or thoracic region (Brislin & Rose, 2005). However, intraspinal morphine can produce the same side effects of nausea, mental clouding, and sedation, because it is absorbed via the cerebrospinal fluid into the circulation of the epidural vascular plexus. Epidural analgesia can be short- or long-term, depending on the patient's condition and life expectancy. Short-term therapy is used for pain after intrathoracic, abdominal, and orthopedic surgery. Long-term therapy is particularly useful for intractable cancer pain (Raffaelli et al., 2006).

Epidural analgesia is administered into the spinal **epidural space** (Figure 41-12). The physician inserts a blunt-tip needle into the level of the vertebral interspace nearest to the area requiring analgesia. When the needle reaches the space, solutions may be freely injected and small catheters may be passed into it. Once a catheter is advanced into the epidural space and the needle is removed, the remainder of the catheter is secured with a dressing and taped along the back of the patient (Figure 41-13). If the catheter is only temporary, it is connected to tubing positioned along the spine and over the patient's shoulder. The end of the catheter can then be placed on the patient's chest for the nurse's access. Epidural analgesia may be anaesthesiology- or nurse-controlled, depending on agency policy. Patients may also be given control of the demand dose, which is known as patient-controlled epidural analgesia (PCEA). When PCEA is utilized, the basal rate is intended to meet the patient's analgesic requirements and the PCEA bolus doses are intended to control periods of breakthrough pain (Pasero, Quinn, et al., 2011). Infants may benefit from a single caudal block whereby a one-time dose of local anaesthetic is

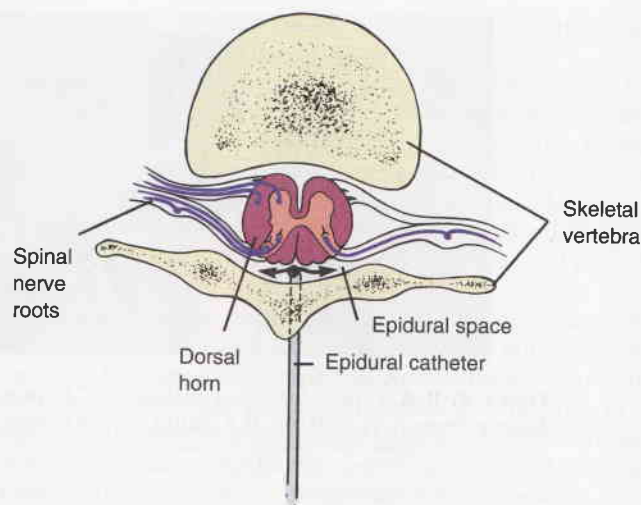


Figure 41-12 Anatomical drawing of epidural space.

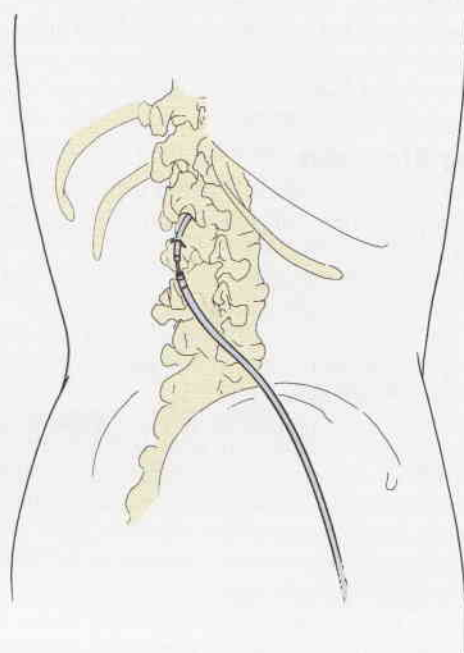


Figure 41-13 Epidural catheter taped in place.

administered to manage surgical pain, specifically with procedures below the level of the umbilicus (Verghese & Hannallah, 2005).

Nursing Implications. You can provide emotional support to patients receiving local or regional anaesthesia by explaining the procedure and warning patients that they will temporarily lose sensory function. Patients commonly fear paralysis because epidural and spinal injections come close to the spinal cord. To reassure the patient, explain that numbness, tingling, and coldness are common. Before a patient receives an analgesic, check for allergies and assess baseline vital signs to monitor systemic effects.

After administration of a local anaesthetic, protect the patient from injury until full sensory and motor function return. Patients are at risk for injuring the anaesthetized body

part without knowing it. For example, after an injection into a joint, warn the patient to avoid using the joint until function returns. For patients with topical anaesthesia, avoid applying heat or cold to numb areas. After spinal anaesthesia, instruct the patient to stay in bed until sensory and motor function return. Assist the patient during the first attempt at getting out of the bed. Ensure proper footwear is worn to prevent falls and to optimize stability.

When managing epidural infusions, connect the catheter to an infusion pump, a port, or a reservoir, or cap it off for bolus injections. To reduce the risk of accidental epidural injection of drugs intended for IV use, clearly label the catheter as an “epidural catheter.” Always administer continuous infusions through electronic infusion devices for proper control. Because of the catheter location, use surgical asepsis to prevent a serious and potentially fatal infection. Notify the physician immediately of any signs or symptoms of infection or pain at the insertion site. Thorough hygiene is necessary during nursing procedures to keep the catheter system clean and dry. Nursing implications for managing epidural analgesia are summarized in Table 41-6.

Supplemental doses of opioids or sedatives (hypnotics) are avoided because they have additive effects that can be detrimental to the central nervous system. Monitoring of

medication adverse effects differs, depending on whether infusions are intermittent or continuous. If opioids are to be administered, mu agonist opioids, such as morphine, fentanyl, and hydromorphone, are the most common choices (Pasero, Quinn, et al., 2011). Adverse reactions can be related to the opioid or the local anaesthetic agent. Refer to your specific institutional protocols for monitoring standards.

Instruct patients about the action of the medication, advantages and disadvantages of the epidural route of medication, and potential side effects, and request they notify a health provider if they develop any side effects. If the patient requires long-term epidural use, inform him or her that a permanent catheter may be tunnelled through the skin and exit at the patient’s side. Teach patients on long-term therapy how to safely administer infusions in the home with minimal ongoing intervention by the nurse.

Invasive Interventions for Pain Relief. When pain is severe, invasive interventions may give relief when more conservative treatment is neither tolerated nor effective. These interventions include intrathecal implantable pumps or injections, spinal cord stimulators, deep brain stimulation, neuroablative procedures (e.g., **chordotomy**, **dorsal rhizotomy**, **thalamotomy**), trigger point injections, radiofrequency ablation, cryoablation, intradiscal electrothermal (IDET) annuloplasty, vertebroplasty, intraspinal medications (e.g., opioids, steroids, local anaesthetics, alpha agonists), and others (Vanni & Rehm, 2010). It is not acceptable to tell a patient with severe unrelieved pain that “there is nothing more we can do for you.” Patients with pain unresponsive to medications need consultation with a pain expert or an interprofessional pain team.

Procedure Pain Management

The Thunder Project II (Puntillo, 2003) identified several procedures in critical care patients that cause pain:

- Turning
- Wound drain removal
- Tracheal suctioning
- Femoral catheter removal
- Placement of central line
- Changing of wound dressings

Premedicating patients before painful procedures may assist them to cooperate and may help to reduce the experience of pain. This is also true for patients who present in the emergency department with abdominal pain. The American Pain Society (2003) recommends medicating the patient in pain before conducting an extensive physical examination or diagnostic procedures.

Cancer Pain Management. Cancer pain may be chronic or acute or a combination. A number of key organizations across Canada, such as Cancer Care Ontario’s Cancer-Related Pain Management Guideline Panel (Green et al., 2010), the Canadian Pain Society (2005), and Cancer Care Nova Scotia (2005) have released evidence-informed clinical practice guidelines for the management of cancer pain. These guidelines are designed to treat cancer pain in a more comprehensive and aggressive manner and provide patients and families with options for pain relief. The choice of treatment may change as the patient’s condition and the characteristics of pain change. Effective pain management is best achieved when pharmacological and nonpharmacological pain interventions are used together and is part of an interprofessional collaborative team approach.

► TABLE 41-6

Nursing Care for Patients With Epidural Infusions

Goal	Actions
Prevent catheter displacement. Maintain catheter function.	Secure catheter (if not connected to implanted reservoir) carefully on skin. Check external dressing around catheter site for dampness or discharge. (Leak of cerebrospinal fluid may develop.) Use transparent dressing to secure catheter and to aid inspection. Inspect catheter for breaks.
Prevent infection.	Use strict aseptic technique when caring for catheter (see Chapter 32). Do not routinely change dressing over site. Change infusion tubing every 24 hours, or as per institutional policy.
Monitor for respiratory depression.	Monitor vital signs, especially respirations, per institutional policy. Pulse oximetry and apnea monitoring may be used, as per institutional policy. Within pediatrics, infants <1 year are often placed in a nurse-monitored room for closer observation and monitoring.
Prevent complications.	Assess for potential side effects, such as pruritus, nausea, and vomiting. Administer appropriate treatments to manage side effects as ordered and required.
Maintain urinary and bowel function.	Monitor intake and output. Assess for bladder and bowel distension. Assess for discomfort, frequency, and urgency. Some institutions will place a Foley catheter, which remains until the epidural is discontinued.

Various medications and routes of administration provide relief for patients with cancer pain. Long-acting or controlled-release medications have been successful in managing all types of chronic pain. These controlled-released medications (e.g., MS Contin, Roxanol SR, OxyContin) relieve pain for 8 to 12 hours. A 72-hour fentanyl patch is also available. Management of most chronic pain can be achieved with oral or patch medications.

Estimates of addiction in patients is difficult to determine. Nicholason and Passik (2007) suggested that the rate of addiction to opioids and alcohol is approximately the same as it is in the general population, ranging from 6% to 10%. In the acute care setting, the prevalence is higher because many medical illnesses such as cancer are complications of addictive disease (McCaffery et al., 2011). Patients with persistent pain requiring prolonged opioid administration sometimes develop an opioid tolerance. As a result, higher doses of opioids are required to attain pain relief. The higher opioid dose is not lethal because patients also develop a tolerance to respiratory depression. For patients with chronic pain, it is necessary to give required analgesics on a regular basis. Prescribing analgesics on a prn basis for chronic pain is likely to be ineffective and result in more suffering. The patient with chronic pain needs analgesics ATC, even when the pain subsides. Regular administration maintains therapeutic drug blood levels for ongoing pain control. Helping patients to understand this will help prevent breakthrough pain and loss of pain control.

Administering analgesics to treat chronic noncancer and cancer pain requires principles different from those used to treat acute pain. The WHO (1996) recommends a three-step approach to managing cancer pain (Figure 41-14). Therapy

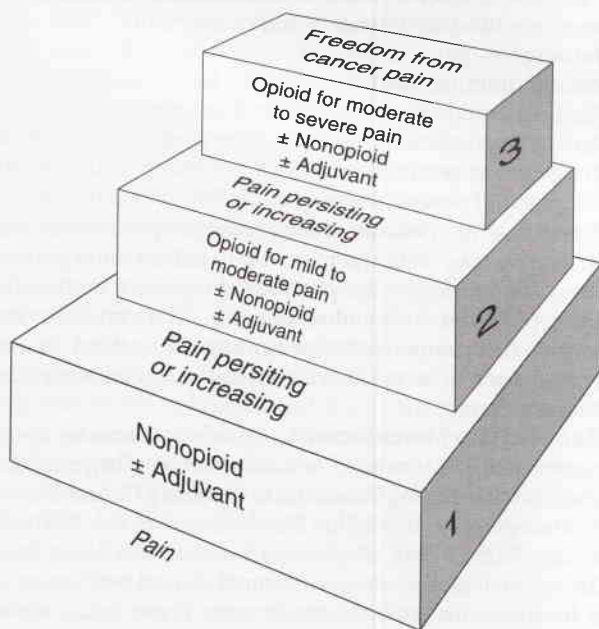


Figure 41-14 WHO's pain relief ladder is a three-step approach to using drugs in cancer pain management. "+/- adjuvant," with or without adjuvant medications. **Source:** From World Health Organization. (1996). *Cancer pain relief with a guide to opioid availability*. Geneva, Switzerland: Author. Retrieved from <http://whqlibdoc.who.int/publications/9241544821.pdf>. Figure also available at <http://www.who.int/cancer/palliative/painladder/en/>.

begins with using NSAIDs, adjuvants, or both and progresses to strong opioids if pain persists. However, when a patient with cancer first experiences pain, it is recommended to begin with a higher dosage than will be needed for continued pain relief. The physician can then slowly decrease the dosage to the amount needed, ensuring immediate pain relief. Side effects of analgesia, such as nausea and constipation, can be aggressively treated so that analgesia can be continued. Patients may become tolerant to the side effects of nausea, but not to the constipating effects of analgesics. Stimulant laxatives should be routinely administered both to prevent and to treat constipation.

Transdermal drug systems administer fentanyl at predetermined doses for up to 48 to 72 hours. Fentanyl is about 100 times more potent than morphine.

safety alert Fentanyl should be used only in patients who are opioid-tolerant.

The transdermal route is useful when patients are unable to take drugs orally. Patients find these systems easy to use, and they allow for continuous opioid administration without needles or pumps. Self-adhesive patches release the medication slowly over time, achieving effective analgesia. You will need to exercise caution when administering transdermal patches to adult patients who weigh less than 45 kg (too little subcutaneous tissue for absorption) or who are hyperthermic. Hyperthermia causes more rapid drug absorption. The patch should never be cut or folded as this alters the drug-releasing mechanism (Pasero, Quinn, et al., 2011). The patches remain in place for 48 to 72 hours, and sites should be rotated with each change. The transdermal patch is generally applied to the back, flank, chest, or upper arm and is deemed to be safe for long-term therapy. Care providers should utilize plastic gloves while manipulating the patches so as to avoid inadvertent absorption of the fentanyl. Medication disposal procedures should be followed within institutions and proper disposal in the home environment to avoid the potential for misuse by other parties and to minimize environmental contamination (Pasero, Quinn, et al., 2011).

A transmucosal fentanyl "unit" (it resembles a lozenge on a handle) has been developed to treat breakthrough pain—a transient flare of moderate to severe pain superimposed on continuous or persistent pain—in opioid-tolerant patients (Box 41-16). Place the unit in the mouth and swab over the buccal mucosa and lower gums. The unit must remain intact to dissolve in the mouth, allowing 15 minutes for absorption. Use no more than two units per breakthrough pain episode. If the patient's pain is not relieved after two units, notify the physician.

Analgesics may be given rectally when patients have nausea and vomiting or are fasting before or after surgery (Pasero, Quinn, et al., 2011). This route is contraindicated if patients have diarrhea or if cancerous lesions involve the anus or rectum. Morphine, hydromorphone, and oxycodone are available as suppositories.

Another way to treat severe cancer pain in the home or acute care setting is with continuous infusions or a basal rate on a PCA device. This provides improved, uniform pain control with fewer peaks and valleys in plasma concentration, more effective drug action, and lower drug dosages overall. Candidates for continuous infusions include patients with

► BOX 41-16 Subtypes of Breakthrough Pain

1. Incident pain: Cause of pain is generally identifiable but occurrence may be unpredictable.
 - a. Predictable incident pain: Something identifiable, such as movement, predictably causes the pain.
 - b. Unpredictable incident pain: Occurrence of pain is unpredictable and may be caused by events such as bladder spasm. Occurs spontaneously.
2. Idiopathic pain: Cause is not readily identifiable.
3. End-of-dose: An increase in baseline pain that occurs prior to a scheduled dose of around-the-clock analgesic. Onset is usually gradual, and duration may be longer than that of incident or idiopathic pain.

Sources: Pasero, C., & McCaffery, M. (2011). *Pain assessment and pharmacological management* (p. 101). St Louis, MO: Mosby/Elsevier. Data from Bennett, D., Burton, A. W., Fishman, S., Fortner, B., McCarberg, B., Miaskowski, C., ..., Wong, W. (2005). Consensus panel recommendations for the assessment and management of breakthrough pain: Part 1: Assessment. *Pharmacology & Therapeutics*, 30(5), 296–301.

severe pain for whom oral and injectable medications provide minimal relief, patients with severe nausea and vomiting, and patients unable to swallow oral medications. The intramuscular route should not be used for controlling cancer pain because the injection itself is painful and absorption of the drug is inconsistent and erratic.

When a patient is first given continuous-drip morphine, it is essential that the IV access be patent and that the IV site be without complications (see Chapter 39). A central line catheter such as a Groshong or Hickman catheter, an implanted venous access port, or a peripherally inserted central catheter (PICC) is usually best suited for long-term IV infusion. When IV access is poor, the subcutaneous route with a concentrated dose is possible.

Barriers to Effective Pain Management. Barriers to effective pain management are complex and can involve the patient, health care provider, and health care system (Box 41-17). A deep-seated and often inappropriate concern shared by health care providers and patients is the fear of addiction when long-term opioid use is prescribed to manage pain. Differences exist between **physical dependence**, **addiction**, and **drug tolerance** (Box 41-18). Experiencing a physical dependency does not imply addiction, and drug tolerance in and of itself does not constitute addiction. Nurses and other health care providers need to avoid labelling patients as “drug seeking” because this term is poorly defined and may negatively affect their care. If you are concerned that a patient is abusing opioids, you have a responsibility to assess addictive issues and engage in a frank discussion with the patient. You should also notify the primary health care provider, explaining the reasons for your unease. You and your team could consider using an opioid contract, a written agreement between a sole prescribing physician and the patient that outlines key points regarding opioid therapy or daily dispensing with a maximum number of pills allotted per day (NOUGG, 2010a). Mehta and Langford (2006) have published recommendations for the management of acute pain in patients who are dependent on opioids but not necessarily addicted.

Individuals with an active addictive disorder or a history of substance abuse are at increased risk of poorly managed

► BOX 41-17 Barriers to Effective Pain Management

Barriers for Patients

Fear of addiction
 Worry about side effects
 Fear of tolerance (drug will be unavailable when needed)
 Concern that patient takes too many pills already
 Fear of injections
 Concern about not being a “good” patient
 Not wanting to worry family and friends
 More tests may be needed
 Belief that one needs to suffer to be cured
 Belief that pain is punishment for past indiscretions
 Inadequate education
 Reluctance to discuss pain
 Belief that pain is inevitable
 Belief that pain is part of aging
 Fear of disease progression
 Belief that health care team members are already doing all that they can
 Fear that patient will forget to take analgesics
 Fear of distracting physicians from treating illness
 Belief that physicians have more important or ill patients to see
 Belief that suffering in silence is noble and expected

Barriers for Health Care Providers

Concern that patient did not receive adequate pain assessment
 Concern about addiction
 Opiophobia (fear of opioids)
 Fear of legal repercussions
 No visible cause of pain exists
 Belief that patients must learn to live with pain
 Reluctance to deal with side effects of analgesics
 Not believing patient's report of pain
 Fear of giving a dose that will kill the patient
 Time constraints
 Belief that opioids may “mask” symptoms
 Belief that pain is part of aging or disease progression
 Overestimation of risks of respiratory depression
 Not viewed as ethical obligation to properly treat pain

Barriers for the Health Care System

Concern with creating “addicts”
 Ability to fill prescriptions
 Nurse practitioners and physician assistants not used efficiently
 Extensive documentation requirements
 Poor pain policies and procedures regarding pain management
 Lack of resources
 Inadequate access to pain clinics; long waiting lists for chronic pain clinics
 Poor understanding of economic impact of unrelieved pain

pain because of clinicians' attitudes, inadequate knowledge about addiction, and fears of exacerbating addiction by administering opioids. Poorly managed pain in these populations results in increased length of hospital stays and more frequent readmissions and outpatient and emergency department visits (Grant et al., 2007).

Placebos may be defined as “any medication or procedure, including surgery, that produces a beneficial effect in a patient because of its implicit or explicit intent, not because of its

► BOX 41-18

Definitions Related to the Use of Opioids for Pain Treatment

Physical Dependence

A state of adaptation that is manifested by a class-specific drug withdrawal syndrome that can be produced by abrupt cessation, rapid dose reduction, decreasing blood level of the drug, or administration of an antagonist. It is not the same as addiction.

Drug Tolerance

A state of adaptation in which exposure to a drug induces changes that result in a diminution of one or more of the drug's effects over time. It is not the same as addiction.

Addiction

A neurobiological disease that has genetic, psychosocial, and environmental factors influencing its development and manifestations. It is characterized by behaviours that include one or more of the following: impaired control over drug use, compulsive use, continued use despite harm, and craving.

Pseudoaddiction

Patient drug-seeking behaviours that may occur when pain is undertreated.

Approved by the Boards of Directors of the American Academy of Pain Medicine, The American Pain Society, and the American Society of Addiction Medicine. February 2001.

See also Health Canada. (1992). *Therapeutic products directorate guidelines: The use of opioids in the management of opioid dependence*. Retrieved from <http://dsp-psd.communication.gc.ca/Collection/H42-2-57-1992E.pdf>; and Pereira, J., & Bruera, E., (Eds.) (2001). Appendix F: Opioid analgesics—Pharmacokinetics. In *Alberta hospice palliative care resource manual* (2nd ed., p. 80) [Electronic version]. Calgary: Alberta Cancer Board. Retrieved from www.palliative.org/PC/ClinicalInfo/ACB%20PC%20resource%20manual.pdf.

specific physical or chemical properties" (McCaffery et al., 2011, p. 42). Administration of a medication at a known subtherapeutic dose is also considered a placebo (Sullivan et al., 2005). Placebos are often appropriately used as controls in randomized controlled drug trials. However, the use of placebos to treat pain is considered unethical and deceitful (McCaffery et al., 2011) and sets up an adversarial relationship between the care providers and the patient and his or her family. If a placebo is ordered, you must question the order and ask, "Why?" Many health care agencies have policies that limit placebo use only to research.

Restorative and Continuing Care

Pain Clinics, Palliative Care, and Hospices. In recent years, health care providers have recognized pain as a significant health problem and, as a result, a number of programs and pain clinics have been developed. A comprehensive pain centre can treat patients on an inpatient or outpatient basis, conduct research into new treatments, and train professionals. Clinicians from various health disciplines, such as pharmacists, nurses, physicians, physiotherapists, pastoral care workers, nutritionists, and social workers, work with patients to discover effective pain-relief measures from a holistic perspective. Many hospitals have palliative care teams to assist patients and families to manage their chronic or end-of-life pain and symptoms diseases. Learning to live fully with an incurable condition is one goal of palliative care (see Chapter 28). Patients and their family members need

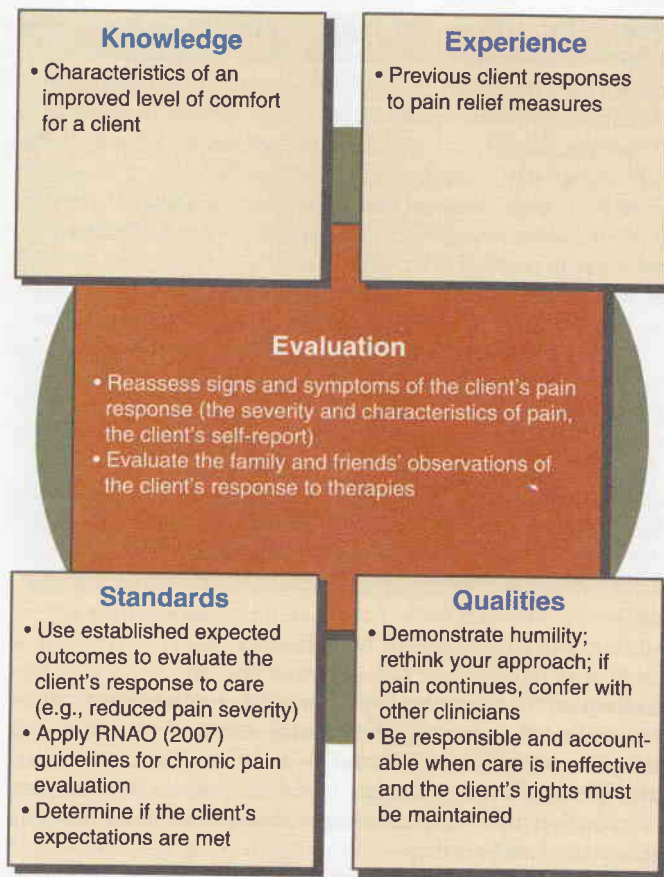


Figure 41-15 Critical thinking model for pain relief evaluation.

ongoing assistance in managing the patient's pain at home. Some palliative care programs have a pain and symptom management team whereby they may be consulted for complex pain and symptom problems.

In Canada, palliative and end-of-life care are burgeoning practice and research fields. The Canadian Institutes of Health Research (CIHR) support research and program development in these clinical areas. A hospice provides specialized end-of-life care in the patient's home or at a facility (see Chapter 28), helping patients with life-limiting illnesses to continue to live at home in comfort and privacy, with effective pain control as one of the priorities (Mehta et al., 2010). Under the guidance of hospice nurses, families learn to monitor patients' symptoms and become their primary caregivers. A hospice patient may become hospitalized in the event of a brief, acute care crisis or family problem.

❖Evaluation**Patient Care**

Evaluating pain is one of many nursing responsibilities that require critical thinking (Figure 41-15). The patient's behavioural responses to pain-relief interventions are not always obvious. Evaluating the effectiveness of a pain intervention requires that you be an intent observer and know what responses to anticipate on the basis of the type of pain, the type of intervention, the timing of the intervention, the physiological nature of the injury or disease, and the patient's previous

responses. Your evaluation involves psychological as well as physiological responses to pain.

If a patient continues to have discomfort after an intervention, try a different approach. For example, if an analgesic provides only partial relief, consider adding relaxation or guided-imagery exercises. Consult with the physician about increasing the dosage, decreasing the interval between doses, or trying different analgesics. Also evaluate tolerance to therapy and the overall relief obtained. If an intervention aggravates discomfort, stop it immediately and seek an alternative. Time and patience are necessary to maximize the effectiveness of pain management. Evaluate the entire pain experience to determine the most effective interventions and times for medication administration.

Patient Perceptions

The patient, if able, is the best resource for evaluating the effectiveness of pain-relief measures. You must continually assess whether the character of the patient's pain changes. The family can be a valuable resource, particularly if the patient has cancer or is noncommunicative and may not be able to express discomfort during the latter stages of terminal illness. Treating pain is successful when the patient's expectations of pain relief are met. Recall, however, that some patients may experience pain needlessly because they accept suffering and because they lack knowledge of available pain-relief interventions.

Pain assessment and responses to intervention should be accurately documented so that they can be communicated to the health care team. Communication occurs from nurse to nurse, shift to shift, and nurse to other health care providers. The nurse caring for the patient is responsible for reporting what has been effective for managing pain. Various bedside tools, such as a pain management flow sheet, help centralize information about pain management. Patients expect you to be sensitive to their pain and to be diligent in managing that pain. Because pain relief is a team effort, communicate effectively with all members, including the patients' family and significant others, to seek a collaborative approach and determine optimal treatment goals (Box 41-19).

❖ KEY CONCEPTS

- Pain is a purely subjective physical and psychosocial experience.
- A nurse's misconceptions about pain may result in doubt about the degree of the patient's suffering and in unwillingness to provide relief.

- Knowledge of the nociceptive pain processes of the pain experience—transmission, transduction, perception, and modulation—will provide you with guidelines for determining pain-relief measures.
- An interaction of psychological and cognitive factors affects pain perception.
- A person's cultural background influences the meaning of pain and how it is expressed.
- It is common for older patients not to report pain.
- Patients who have chronic pain are unlikely to show behavioural changes.
- Do not collect an in-depth pain history when the patient is experiencing severe discomfort.
- Pain can cause physical signs and symptoms similar to the signs and symptoms of other diseases.
- Patients waiting to undergo invasive tests may gain some pain relief from anticipatory guidance.
- Individualize your pain interventions by collaborating closely with the patient, using assessment findings, and trying a variety of interventions.
- Eliminating sources of painful stimuli is a basic nursing measure for promoting comfort.
- Use a regular schedule for analgesic administration, as this is more effective than an as-needed schedule in controlling pain.
- A patient-controlled analgesic device gives patients pain control, with low risk of overdose.
- While caring for a patient who receives local anaesthesia, protect the patient from injury.
- When administering epidural analgesia, take steps to prevent infection and monitor closely for respiratory depression.
- Your primary goal in pain management is to anticipate and prevent pain, rather than to treat it.
- In evaluating the effectiveness of a pain intervention, consider the changing character of pain, the patient's response to the intervention, and the patient's perceptions of a therapy's effectiveness.

❖ CRITICAL THINKING EXERCISES

1. Do you have a friend or family member who lives with cancer and is willing to talk about it? If so, ask the individual to tell you about different painful experiences they may have had and what he or she would recommend to help nurses provide better care during these painful events.
2. Madeleine Tremblay is a 40-year-old woman newly diagnosed with fibromyalgia. She is married and has a daughter and son, who are two and five years old, respectively. Her husband travels frequently and is often home only on weekends. Mrs. Tremblay tells the nurse: "The pain is so bad at night that I only get three or four hours of sleep. I have no opportunity to rest during the day because I'm busy caring for my children. I am so tired that I don't know how I am going to cope with this pain long-term." Identify two follow-up care plan components that would be important when considering Mrs. Tremblay's concerns regarding the management of her pain.
3. Alexis, aged three years, is admitted to the pediatric unit for a third-degree burn to her right lower extremity. How would you proceed in assessing this child's pain?
4. Mrs. Gorsky, an 83-year-old woman with metastatic breast cancer to the bone, has been receiving IV morphine for a week for severe back and leg pain. Her frequently increased infusion of morphine is not reducing her pain to an acceptable level, and she is becoming increasingly sedated. What other pharmacological interventions might be considered?

► BOX 41-19

Establishing a Collaborative Team Approach to Pain Management

1. Establish common goals for pain relief and optimal functioning.
2. Use common language regarding pain assessment and management.
3. Use validated pain-rating scales.
4. Secure a common knowledge base and encourage the use of clinical practice guidelines.
5. Optimize regular team communication opportunities for direct communication and problem solving.

Data from Arnstein, P. (2010). *Clinical coach for effective pain management*. Philadelphia, PA: F. A. Davis; and Pasero, C., & McCaffery, M. (2011). *Pain assessment and pharmacological management*. St Louis, MO: Mosby/Elsevier.

✦ REVIEW QUESTIONS

- As one of the strategies used to help relieve Mme Bouclair's pain during a dressing change, the nurse encourages her to concentrate on a favourite vacation setting. What is this non-pharmacological pain intervention known as?
 - Recall
 - Distraction
 - Imagery
 - Relaxation exercises
- A patient complains of pain in a cutaneous site that is different from where it originates. How does the nurse document this pain?
 - Transient pain
 - Superficial pain
 - Phantom pain
 - Referred pain
- Jacobie is a cooperative five-year-old Inuit boy who had abdominal surgery 24 hours ago. Which of the following validated pain assessment tools would be the most appropriate for the nurse to use to assess this child's pain?
 - FLACC
 - Numerical Rating Scale
 - The Northern Pain Scale
 - Wong-Baker FACES Scale
- Which one of the following responses would the nurse expect to assess as a physiological response to moderate pain?
 - Restlessness
 - Decreased heart rate
 - Increased blood pressure
 - Protection of the painful area
- Mr. Kumar, an 82-year-old man with Alzheimer's disease, is restless and moaning. His daughter states that he did not sleep well most of the night. Which one of the following actions is the most appropriate initial nursing response?
 - Obtain a psychiatric evaluation.
 - Administer pain medication as ordered.
 - Recommend giving the patient sleeping medication.
 - Assess and document physical and behavioural data.
- Mrs. Young requests medication for her abdominal incision pain, which she rates as 5 (scale of 0 to 10, with 10 being the worst pain). One hour after administration of her pain medication, she is able to walk in the hall for 10 minutes and rates her pain as a 2/10. Which one of the following interpretations about the dosage of pain medications is the most appropriate?
 - Adequate
 - Excessive
 - Insufficient
 - Unnecessary
- Which one of the following nursing actions is the most appropriate when a patient is anticipating a painful procedure?
 - Discuss analgesic options with the physician.
 - Inform the patient that the discomfort will be minimal.
 - Teach about the procedure and its associated discomfort.
 - Provide education about the procedure but avoid the associated discomfort.
- Relaxation and guided imagery are examples of which one of the following?
 - Adjuvants
 - Physical interventions
 - Patient-controlled analgesia
 - Cognitive-behavioural interventions
- The Canadian Pain Society recommends which method of opioid administration if pain is anticipated for the majority of the day?
 - On an as-needed (prn) basis
 - With complementary therapies
 - On an around-the-clock (ATC) basis
 - When the pain tolerance level is exceeded
- Patient-controlled analgesia (PCA) is often used for postoperative and cancer pain management for which one of the following reasons?
 - To improve nursing control over opioid administration
 - To promote sustained pain relief, with the patient in control
 - To enable family members to administer the drug dosage
 - To decrease the quantity of opioid medication use

✦ RECOMMENDED WEB SITES

Health Canada: <http://www.hc-sc.gc.ca/index-eng.php>

Health Canada provides an extensive listing of clinical guidelines for nurses in primary care. It provides the public, clinicians, and researchers with information on pain and other public health concerns, such as this document outlining questions, issues, and research surrounding neuropathic pain.

Canadian Pain Society: <http://www.canadianpainsociety.ca/en/> or <http://www.canadianpainsociety.ca/fr/>

The Canadian Pain Society is an association whose members include physicians, nurses, and other clinicians involved with the management of pain. Its aim is to foster and encourage research on pain, to promote education and training in the field of pain, and to improve the management of patients with acute and chronic pain.

The University of Toronto Centre for the Study of Pain: <http://www.utoronto.ca/pain/>

The University of Toronto Centre for the Study of Pain is a partnership involving the faculties of dentistry, medicine, nursing, and pharmacy. The mission of the centre is to lead, both nationally and internationally, in pain research, education, knowledge translation, networking, and sustainability.

International Association for the Study of Pain (IASP): <http://www.iasp-pain.org/>

The IASP is the leading professional forum for science, practice, and education in the field of pain. IASP brings together scientists, clinicians, health care providers, and policymakers to stimulate and support the study of pain and to use that knowledge for improved pain relief worldwide.

Canadian Hospice Palliative Care Association: <http://chpca.net/index>

This site is intended as an educational resource for professional and informal caregivers and interest groups. It includes an extensive listing of online resources for those interested in palliative and end-of-life care, including cancer, clinical, and research sites.

Registered Nurses' Association of Ontario: Assessment and Management of Pain: <http://www.rnao.org/Page.asp?PageID=924&ContentID=720>

The Registered Nurses' Association of Ontario's site is specific to nursing and is available in English and French. It features a number of best practice clinical guidelines, including those for the assessment and management of pain.

Canadian Cancer Society: <http://www.cancer.ca>

This site is an educational resource to help cancer patients and their caregivers. It has the most up-to-date knowledge and tools available related to cancer prevention, diagnosis, treatments, and supports and services. It also features a number of pain management publications, which include information on traditional and complementary therapies.

The Mayday Pain Project: <http://www.painandhealth.org/>

The Mayday Pain Project's goal is to improve pain assessment and care of patients nationally and internationally, particularly

for those living in rural, isolated areas. The site presents well-researched resources in a professional manner for educational purposes only.

Pain Treatment Topics: <http://pain-topics.org/>

This site is a noncommercial resource for health care providers and their patients, providing open access to clinical news, information, research, and education for a better understanding of evidence-informed pain-management practices.

Review Question Answers

1. 3, 2, 4, 3, 3, 4, 3, 5, 4, 6, 3, 7, 3, 8, 4, 9, 3, 10, 2

Rationales for the Review Questions appear at the end of the book.

Nutrition

Written by Kathryn Weaver, RN, PhD

Based on the original chapter by Patricia A. Stockert, RN, BSN, MS, PhD

objectives

Mastery of content in this chapter will enable you to:

- Define the key terms listed.
- Explain the role of each major nutrient in proper nutrition.
- Explain the importance of maintaining a balance between energy intake and expenditure.
- List the end products of carbohydrate, protein, and fat metabolism.
- Explain the significance of saturated, unsaturated, polyunsaturated, and trans fats.
- Describe *Eating Well with Canada's Food Guide* and its value in planning nutritious meals.
- Specify recommended dietary intake for age and sex groups in Canada to ensure that patients meet the varied essential vitamins, minerals and nutritional requirements throughout their growth and development.
- Discuss the major methods of nutritional assessment.
- Identify three major nutritional problems, the patients who are at risk, and related nutrition therapy.
- Formulate a plan of care to help meet the specific nutritional needs of infants, toddlers, preschoolers, school-aged children, adolescents, adults, and older adults.
- Identify the potential nutritional deficits associated with vegetarian diets, with special consideration to vegan and ovo-lactate diets.
- Discuss diet counselling and patient teaching in relation to patient expectations.
- State the goals of enteral and parenteral nutrition.
- Describe the procedure for initiating and maintaining tube feedings, and avoiding related complications.

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key terms

- Amino acids, p. 1052
- Anabolism, p. 1055
- Anorexia, p. 1078
- Anorexia nervosa, p. 1061
- Anthropometry, p. 1068
- Aquaporins, p. 1053
- Aspiration, p. 1054
- Basal metabolic rate (BMR), p. 1051
- Body mass index (BMI), p. 1068
- Bulimia nervosa, p. 1061
- Carbohydrates, p. 1052
- Catabolism, p. 1055
- Cholesterol, p. 1053
- Chyme, p. 1055
- Complementary proteins, p. 1052
- Complex carbohydrates, p. 1052
- Dietary reference intakes (DRIs), p. 1056
- Dysphagia, p. 1054
- Elemental formulas, p. 1087
- Enteral nutrition, p. 1082
- Enzymes, p. 1053
- Essential amino acids, p. 1052
- Fat-soluble vitamins, p. 1053
- Fatty acids, p. 1052
- Food security, p. 1056
- Fortified, p. 1052
- Functional, p. 1052
- Genetically modified, p. 1052
- Gluconeogenesis, p. 1055
- Glycemic index, p. 1052
- Glycogenesis, p. 1055
- Glycogenolysis, p. 1055
- Hypervitaminosis, p. 1053
- Ideal body weight (IBW), p. 1068
- Ketones, p. 1055
- Lipid emulsions, p. 1107
- Lipids, p. 1052
- Macrominerals, p. 1053
- Metabolism, p. 1055
- Minerals, p. 1053
- Modular formulas, p. 1087
- Monounsaturated fatty acids, p. 1052
- Nitrogen balance, p. 1052
- Nonessential amino acids, p. 1052
- Nutrient density, p. 1052
- Nutrients, p. 1051
- Nutritional assessment, p. 1068
- Nutritional screening, p. 1068
- Parenteral nutrition, p. 1107
- Peristalsis, p. 1054
- Polymeric formulas, p. 1087
- Polyunsaturated fatty acids, p. 1053
- Refeeding syndrome, p. 1100
- Resting energy expenditure (REE), p. 1051
- Saccharides, p. 1052
- Saturated (fatty acids), p. 1052
- Simple carbohydrates, p. 1052
- Specialty formulas, p. 1087
- Trace elements, p. 1053
- Trans fatty acids, p. 1053
- Triglycerides, p. 1052
- Unsaturated (fatty acids), p. 1052
- Vegetarianism, p. 1065
- Vitamins, p. 1053
- Waist circumference, p. 1068
- Water-soluble vitamins, p. 1053

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Proper nutrition and food safety—important to all Canadians—are a shared responsibility among government, industry, health providers, and consumers. Food supplies energy to accomplish everyday activities, building and repairing tissues and regulating organs and systems while helping to prevent the contraction of certain diseases and aid in the recovery from other diseases. One of the best ways to protect and promote good health is to ensure a nutritious and balanced diet. Food also holds symbolic meaning for many cultures and communities. Ceremonies, social gatherings, and religious events happen within the background of giving or taking food significant to the event. With such a complexity of meanings embedded in the food we eat, it is no wonder that the withholding of food, even in the form of intravenous (IV) nutrients, during a terminal illness reflects the symbolic power that food has over life and death.

Over a century ago, the mother of modern nursing, Florence Nightingale (1858), instructed nurses to maintain knowledge of the patient's diet: "Consider, remember how much he [or she] has had, and how much he [or she] ought to have" (p. 39). As nurses today, our role in promoting proper nutrition, diet therapy, and health continues to be vital. We must pay as much attention to our patients' diets as to their illnesses, treatments, and therapies. With advances in science, trends in illnesses and demographics, and the explosion of media attention on weight and fitness, our role in addressing diet-related issues has expanded. For example, in illnesses such as type 1 diabetes mellitus, a common health concern across Western nations, diet can be a major treatment and nurses the key professionals responsible for educating patients and families about food choices and available technology (e.g., insulin pumps) that influence the course of the disease and assist in self-care management (Canadian Diabetes Association [CDA], 2009). Along with type 1 diabetes, other conditions, such as type 2 diabetes, hypertension, and inflammatory bowel disease, require highly specialized nutritional support protocols, including diets low in sugars, cholesterol, or salt (Hypertension Canada, 2010).

Overall, the nutritional health of Canadians is good in comparison to that of other developed countries. This story may be changing, however, as evolving demographic and economic issues result in less time and fewer resources available for food-related activities. These issues include the rising poverty rate, a decline in resources available to rural communities, the aging of the population, and the social isolation or marginalization of certain groups of citizens. Rates of stay-at-home spouses have dropped significantly to 10% of Canadian households, leaving the majority of preschool children in day care or school while parents work. Unemployment rates have risen, and reduced-income earners now reflect a Canadian population facing economic difficulties such as accumulated debt, household budget deficits, and restricted choices for purchasing power. One in ten Canadian children, more than a million, lives below the poverty line according to the *2010 Report Card on Child and Family Poverty in Canada* (Campaign 2000, 2010). Statistics Canada (2010a) has indicated that a larger portion of the Canadian population is entering retirement age, and these older adults are choosing to stay in their own homes longer, placing them at risk for poor nutrition associated with mobility impairments and social isolation. In addition, between 2001 and 2006, Canada's Aboriginal population increased by 20.1% of the total population (Health Canada, 2010d); this is significant because Aboriginal children account for approximately

5% of all children in Canada (Ball, 2008) with one in every four Aboriginal children living below the poverty line (Campaign 2000, 2010). Canada's population is no longer predominantly White; about 133,900 of the 236,800 immigrants entering the country in 2007 came from the continent of Asia, representing more than half (56.5%) of all immigrants (Statistics Canada, 2010b). All these factors, along with the larger international issues arising from free trade and globalization, influence the nutritional health of Canadians.

One trend that has taken on alarming proportions is the increase in overweight and obesity. In 2004, approximately 59% of adult Canadians were overweight or obese (Statistics Canada, 2004). By 2009, about 18% of Canadian adults, or roughly 4.4 million people, reported height and weight that classified them as obese. This was up from 15% reported in 2004 (Statistics Canada, 2010c). Likewise, the prevalence of overweight or obesity in children has soared. Type 2 diabetes, an illness largely preventable through healthy eating and weight management that in the past occurred mainly in older individuals (Canadian Paediatric Society, 2005), is now being diagnosed in Canadian children as young as eight years of age (CDA, 2011a). Among Aboriginal people, rates of type 2 diabetes are three to five times higher than those of the general population (Health Canada, 2010d). Factors adversely affecting the nutritional health of today's Canadian society are serious, and the resultant conditions border on epidemic proportions. It is critical that nurses acquire nutritional knowledge to apply to the complexities of diseases, diverse populations, and current demographics (age, gender, income level, and culture).

Scientific Knowledge Base

Nutrients: The Biochemical Units of Nutrition

The body requires fuel to provide energy for the chemical reactions that enable cellular growth and repair, organ function, and body movement. The energy requirement of a person at rest is called the **basal metabolic rate (BMR)**. This is the energy needed to maintain life-sustaining activities (breathing, circulation, heart rate, and temperature) for a specific period of time. The **resting energy expenditure (REE)** is a measurement that accounts for BMR plus energy to digest meals and perform mild activity. REE is a baseline of energy requirement accounting for approximately 60% to 75% of our daily needs. Factors of age, body mass, gender, fever, environmental temperature, pregnancy, lactation, starvation, stress, illness, injury, infection, activity level, thyroid function, or the use of certain drugs may affect energy requirements or metabolism.

In general, when energy requirements are completely met by kilocalorie (kcal) intake in food, weight does not change. A kilocalorie is the unit of energy required to raise one kilogram of water by 1°C (referred to as "calorie" by the general public). When the kilocalories ingested exceed energy demands, a person gains weight. If the kilocalories ingested fail to meet energy requirements, a person loses weight.

Nutrients are the elements supplied by food that are necessary for body processes and function. Energy needs are met from three categories of nutrients: carbohydrates, proteins, and fats. Other nutrients are water, vitamins, and minerals, which do not provide energy but contribute to metabolic processes, including acid-base balance. A nutrient is considered essential if the body cannot manufacture it in a sufficient quantity to meet metabolic demands.

Foods are described according to **nutrient density**, the proportion of essential nutrients to the number of kilocalories. High nutrient-density foods, such as fruits and vegetables, provide a large number of nutrients in relation to kilocalories. Low nutrient-density foods, such as alcohol or refined sugar, are high in kilocalories but nutrient poor.

Foods may also be described as functional, fortified, or genetically modified. Foods are considered **functional** when a biologically active substance is added; for example, probiotics, such as bacterial cultures added to yogurt or juices (Paulionis, 2008; Verschuren, 2002). **Fortified** foods contain vitamins or minerals added during processing to increase the daily value by as much as 10% or 20%. Current fortification practices require the addition of vitamin D to milk to combat the childhood disease of rickets and the addition of folic acid to flour to reduce birth defects (Health Canada, 2005a). Although fortification has shown marked improvements in intakes of vitamin A, vitamin C, magnesium, folate, and calcium for some age and sex groups, fortification of other nutrients may be unnecessary when not based on an assessment of current nutrient intake patterns (Sacco & Tarasuk, 2009). The term **genetically modified** refers to the practice of pasting the genes of one organism into another organism often to resist disease and develop desired characteristics, such as a hardier texture, higher nutritional value, or faster growth (Health Canada, 2010f).

Carbohydrates. Carbohydrates are the recommended main source of energy in the diet. Each gram of carbohydrate produces 4 kcal and serves as the main source of fuel (glucose) for the brain, skeletal muscles during exercise, red and white blood cell production, and cell function of the renal medulla. Carbohydrates are obtained primarily from plant foods, except for lactose (milk sugar), and are classified according to their carbohydrate units, or **saccharides**.

Monosaccharides such as glucose (dextrose) or fructose (fruit sugar) are the building blocks of all other carbohydrates and cannot be broken down into a more basic carbohydrate unit. Disaccharides such as sucrose, lactose, and maltose are composed of two monosaccharides minus one unit of water. Both monosaccharides and disaccharides are classified as **simple carbohydrates** called *sugars*. Polysaccharides are composed of many carbohydrate units and are classified as **complex carbohydrates**. They include starch (stored form of glucose in plants) and glycogen (stored glucose in animals and humans). Some polysaccharides cannot be digested because humans do not have enzymes capable of breaking them down. Insoluble fibres are not digestible and include cellulose, hemicellulose, and lignin. Soluble fibres include pectin, guar gum, and mucilage. Dietary fibre is important to disease prevention, as it decreases low-density lipoprotein (LDL) cholesterol associated with the development of heart disease (Schlenker & Long, 2011).

Carbohydrate-rich foods are ranked according to their **glycemic index**, the effect on blood glucose levels and insulin response (CDA, 2011b). Carbohydrates that release glucose rapidly into the bloodstream (e.g., white bread, candy) have a high glycemic index. Carbohydrates that produce only small fluctuations in blood glucose (e.g., barley, lentils) have a low glycemic index and offer long-term health benefits of sustaining weight loss, prolonging physical endurance, and reducing risks associated with heart disease and diabetes.

Proteins. Proteins are essential for synthesis (building) of body tissue in growth, maintenance, and repair. Collagen, hormones, enzymes, immune cells, DNA, and RNA are all

composed of protein. In addition, blood clotting, fluid regulation, and acid-base balance require proteins. Nutrients and many pharmacological substances are transported in the blood by proteins.

The simplest form of protein is the amino acid. As with other nutrients, **essential amino acids** are those that the body cannot synthesize but must have provided in the diet. **Nonessential amino acids** can be synthesized by the body. **Amino acids** are linked together by peptide bonds to form larger protein molecules called polypeptides. Simple proteins such as albumin and insulin contain only amino acids or their derivatives. The combination of a simple protein with a nonprotein substance produces a more complex protein, such as lipoprotein, formed by a combination of a lipid (fat) and a simple protein.

Protein quality is determined by the balance of essential amino acids. Incomplete proteins lack a sufficient quantity of one or more essential amino acids and include cereals, legumes (beans, peas), and vegetables. A complete protein contains all of the nine essential amino acids in sufficient quantity to support growth and maintain nitrogen balance. Examples of foods that contain complete proteins are chicken, soybeans, fish, and cheese. Complete proteins are referred to as high-quality proteins. **Complementary proteins** are pairs of incomplete proteins that, when combined, supply the total amount of protein provided by complete protein sources.

Protein is the only major nutrient that contains nitrogen (it is 16% nitrogen) and is the only source of nitrogen for the body. Thus, nitrogen can be used to determine protein balance in the body. **Nitrogen balance** is achieved when the intake and output of nitrogen are equal. When the intake of nitrogen exceeds the output, the body is in positive nitrogen balance, which is required for growth, normal pregnancy, maintenance of lean muscle mass and vital organs, and wound healing. The nitrogen retained by the body is used for the building, repair, and replacement of body tissues. Negative nitrogen balance occurs when the body loses more nitrogen than it gains—for example, with severe infection, burns, fever, starvation, head injury, and trauma. The increased nitrogen loss is the result of body tissue destruction or loss of nitrogen-containing body fluids through urine, feces, sweat, and, at times, bleeding or vomiting. Nutrition during this period must provide nutrients to put patients into positive balance for healing.

Protein can be used to provide energy (4 kcal/g), but because of protein's essential role in growth, maintenance, and repair, adequate kilocalories should be provided in the diet from nonprotein sources. Protein is spared as an energy source when carbohydrate in the diet is sufficient to meet the energy needs of the body.

Fats. Fats (**lipids**) are the most calorically dense nutrient, providing 9 kcal/g. In addition to serving as fuel that supplies energy, fat cushions vital organs, lubricates body tissue, insulates, and protects cell membranes. Fats are composed of glycerol and fatty acids. **Triglycerides** circulate in the blood and are made up of three fatty acids attached to a glycerol. **Fatty acids** are composed of chains of carbon and hydrogen atoms with an acid group on one end of the chain and a methyl group at the other. Fatty acids can be **saturated**, in which each carbon in the chain has two attached hydrogen atoms, or **unsaturated**, in which an unequal number of hydrogen atoms are attached and the carbon atoms attach to each other with a double bond. **Monounsaturated fatty acids** have one double bond, whereas

polyunsaturated fatty acids have two or more double carbon bonds. Most animal fats have high proportions of saturated fatty acids, whereas vegetable fats have higher amounts of monounsaturated and polyunsaturated fatty acids. The various types of fatty acids have significance for health and the incidence of disease and are referred to in the dietary guidelines from the Heart and Stroke Foundation, the Canadian Cancer Society, and the Canadian Diabetes Association.

Trans fatty acids have received attention for their role in the development of coronary artery disease, diabetes, infertility in women, and prostate cancer in men (Merchant et al., 2008; Salmerón et al., 2001). **Trans fatty acids** are formed by the partial hydrogenation of vegetable oils and are mostly found in prepared foods, snack foods, and margarines. Trans fats raise blood levels of so-called bad cholesterol (LDL-cholesterol), a risk factor for heart disease, while lowering blood levels of so-called good cholesterol (HDL-cholesterol) which protects against heart disease (Health Canada, 2008). Increased research and consumer awareness has led to mandatory nutrition labelling of trans fats in Canada since 2005. The acceptable macronutrient distribution range (AMDR), the range associated with reduced risk of chronic illness while providing essential intakes of total fat, is 20% to 35% for adults (American Dietetic Association and Dietitians of Canada, 2007). It is recommended that Canadians decrease their intake of the proportion of saturated and trans fatty acids. There is evidence of reductions in trans fats in margarines since new labelling regulations came into effect in Canada; however, trans fat reductions may be restricted to higher-priced margarines, a change that may have limited benefit for lower-income groups, who are at higher risk of heart disease (Ricciuto et al., 2009).

Cholesterol is often discussed in connection with fats, although it is a sterol, not a triglyceride (Schlenker & Long, 2011). It occurs naturally in animal foods but is also synthesized by the liver. Cholesterol deposits in blood vessel walls cause atherosclerosis, which is the underlying cause of coronary artery disease.

Water. Water is a critical component of the body because cell function depends on a fluid environment. Water makes up 60% to 70% of total body weight. The percentage of total body water is greater for lean people than for obese people because muscle contains more water than any other tissue except blood. Infants have the greatest percentage of total body water, and older people have the least. When deprived of water, a person cannot survive for more than a few days. Water helps regulate body temperature and acts as a solvent for nutrients and waste products. Water passes freely through membranes that separate body fluids inside (intracellular) and outside (extracellular) cells. Various water-transport proteins called **aquaporins** function as water-selective channels in many cells, altering the speed at which water crosses cell membranes and influencing conditions such as cataract formation and hypertension (Verkman, 2005).

Fluid needs are met by ingesting liquids and solid foods high in water content, such as fresh fruits and vegetables. Water is also produced during digestion when food is oxidized. In a healthy individual, fluid intake from all sources equals fluid output through elimination, respiration, and sweating (see Chapters 35 and 39). An ill person can have an increased need for fluid (e.g., with fever or gastrointestinal losses) and also a decreased ability to excrete fluid (e.g., with cardiopulmonary or renal disease), which may lead to the need to restrict fluid intake.

Vitamins. Vitamins are organic substances essential to normal metabolism. The body is unable to synthesize most vitamins in the required amounts and depends on dietary intake. The quantity of vitamins in food is affected by food processing, storage, and preparation. Vitamin content is usually highest in fresh foods used quickly after minimal exposure to heat, air, or water. Certain vitamins function as antioxidants that neutralize substances called free radicals, which are thought to produce oxidative damage to body cells and tissues and to increase a person's risk for various cancers. Vitamins with antioxidant properties include water-soluble vitamin C and fat-soluble beta-carotene and vitamins A and E (Schlenker & Long, 2011).

Fat-Soluble Vitamins. The fat-soluble vitamins (A, D, E, and K) can be stored in the body. With the exception of vitamin D, these vitamins are provided only through dietary intake. Vitamin D is provided by both dietary intake and synthesis in the body with exposure to sunlight. Canada's food guide recommends that adults consume 500 mL (2 cups) of milk each day in order to receive adequate vitamin D. Yet because vitamin D needs increase after the age of 50 and obtaining adequate vitamin D from the diet alone is very difficult, Health Canada (2010g) recommends that all adults over the age of 50 take a daily vitamin D supplement of 10 micrograms (mcg; 400 IU) in addition to following Canada's Food Guide. The body can store fat-soluble vitamins; therefore, **hypervitaminosis** can result from megadoses (intentional or unintentional) of supplemental vitamins, excessive amounts of vitamins in fortified food, and excessive fish oils.

Water-Soluble Vitamins. The water-soluble vitamins are vitamins C and B complex (which consists of eight vitamins: thiamine, riboflavin, niacin, vitamin B₆, folate, vitamin B₁₂, pantothenic acid, and biotin). Another element, choline, is sometimes classified as a B vitamin. Water-soluble vitamins are easily destroyed by cooking and must be provided in the daily food intake. Although water-soluble vitamins are not stored in the body, toxicity may still occur with vitamin megadoses.

Minerals. Minerals are inorganic elements essential to the body as catalysts in biochemical reactions. Minerals become part of the structure of the body and its enzymes. For example, iron becomes attached to protein globin to form hemoglobin, which enhances oxygen-carrying capacity. Minerals are classified as **macrominerals** when the daily requirement is 100 mg or more and as **microminerals** or **trace elements** when less than 100 mg is needed daily. The macrominerals are calcium, sodium, potassium, phosphorus, magnesium, sulphur, and chloride. Trace minerals include iron, iodine, fluoride, zinc, selenium, chromium, copper, manganese, molybdenum, and cobalt. Other trace minerals such as aluminum, cadmium, arsenic, and boron have possible but not clearly delineated nutritional functions. Arsenic, aluminum, and cadmium have toxic effects.

Anatomy and Physiology of the Digestive System

Digestion. Digestion of food consists of mechanical breakdown that results from chewing, churning, and mixing with fluid, as well as chemical reactions by which food is reduced to its simplest form. Each part of the gastrointestinal system has an important digestive or absorptive function (Figure 42-1).

Enzymes are an essential component of the chemistry of digestion. Enzymes are proteinlike substances that act as

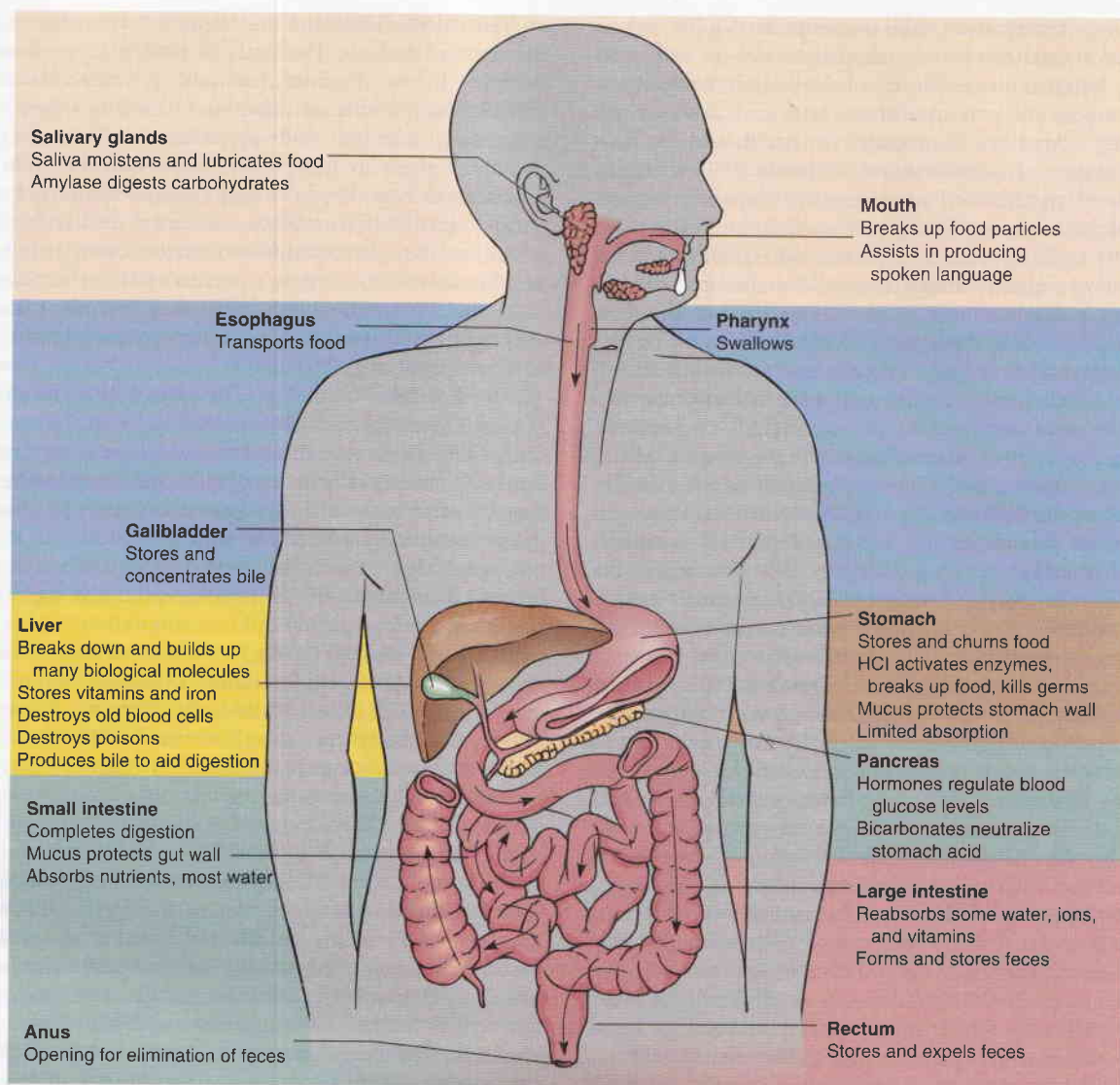


Figure 42-1 Summary of digestive system anatomy and organ function. **Source:** From Rolin Graphics.

catalysts to speed up chemical reactions. Most enzymes have one specific function and function best at a specific pH. The secretions of the gastrointestinal tract have vastly different pH levels. For example, saliva is relatively neutral, gastric juice is highly acidic, and the secretions of the small intestine are alkaline.

The mechanical, chemical, and hormonal activities of digestion are interdependent. Enzyme activity depends on the mechanical breakdown of food to increase the surface area for chemical action. Hormones regulate the flow of digestive secretions needed for enzyme supply. The secretion of digestive juices and the motility of the gastrointestinal tract are also regulated by physical, chemical, and hormonal factors. Action in the gastrointestinal tract is increased by nerve stimulation from the parasympathetic nervous system (e.g., the vagus nerve).

Digestion begins in the mouth, where chewing mechanically breaks down food. The food is mixed with saliva, which contains ptyalin (salivary amylase), an enzyme that acts on cooked starch to begin its conversion to maltose. The longer food is chewed, the more starch digestion occurs in the mouth.

Proteins and fats are broken down physically but remain unchanged chemically because enzymes in the mouth do not react with these nutrients. Because simple sugars (monosaccharides) require no digestion, they may be absorbed from the mouth. Chewing reduces food particles to a size suitable for swallowing, and saliva provides lubrication to further ease swallowing of the food. The epiglottis is a flap of skin that closes over the trachea during swallowing to prevent **aspiration**. The tongue manoeuvres the mass of chewed food into the pharynx, which activates the swallowing reflex. Swallowed food enters the esophagus and is moved along by wave-like muscular contractions (**peristalsis**) to the base of the esophagus, above the cardiac sphincter. Pressure from a bolus of food at the cardiac sphincter causes it to relax, allowing the food to enter the fundus (uppermost portion) of the stomach. Difficulty swallowing is referred to as **dysphagia**.

In the stomach, pepsinogen is secreted by chief cells and then converted by hydrochloric acid (HCl) to pepsin, a protein-splitting enzyme. Gastric lipase and amylase are produced to begin fat and starch digestion, respectively. The stomach's pyloric glands secrete gastrin, a hormone that triggers parietal

cells to secrete intrinsic factor (IF) and HCl. IF is necessary for absorption of vitamin B₁₂ in the ileum. HCl also destroys bacteria, increases the absorbability of iron and calcium, and maintains the pH of the gastric juice. The lining of the stomach is protected from autodigestion by a thick layer of mucus. Alcohol and aspirin are two substances directly absorbed through the lining of the stomach. The muscular walls of the stomach produce a churning action that continues mechanical digestion. The stomach acts as a reservoir where food remains for approximately three hours, within a range of one to seven hours.

Food leaves the antrum, or distal stomach, via the pyloric sphincter and enters the duodenum as an acidic, liquefied mass called **chyme**. Chyme flows into the duodenum and is quickly mixed with bile, intestinal juices, and pancreatic secretions. Secretin and cholecystokinin (CCK) are hormones secreted by the mucosa of the small intestine. Secretin activates release of bicarbonate from the pancreas, raising the pH of chyme. CCK inhibits further gastrin secretion and initiates the release of additional digestive enzymes from the pancreas and gallbladder.

Bile is manufactured in the liver and stored in the gallbladder. Bile acts as a detergent, as it emulsifies fat to permit enzyme action while suspending fatty acids in solution. Pancreatic secretions contain six enzymes: amylase to digest starch; lipase to break down emulsified fats; and trypsin, elastase, chymotrypsin, and carboxypeptidase to break down proteins.

Peristalsis continues in the small intestine, mixing the secretions with the chyme. The mixture becomes increasingly alkaline, inhibiting the action of the gastric enzymes and promoting the action of the duodenal secretions. Epithelial cells in the inner walls of the small intestine secrete enzymes to facilitate digestion. These enzymes include sucrase, lactase, maltase, lipase, and peptidase. The major portion of digestion occurs in the small intestine, producing glucose, fructose, and galactose from carbohydrates; amino acids and dipeptides from proteins; and fatty acids, glycerides, and glycerol from lipids. Approximately five hours are required to pass food through the small intestine via peristalsis.

Absorption. The small intestine is the primary absorption site for nutrients. Its inner surface is lined with fingerlike projections called villi, which increase the surface area available for absorption. Nutrients are absorbed by means of passive diffusion, osmosis, active transport, and pinocytosis (Box 42-1).

The main source of water absorption is via the intestine. Approximately 7 L of gastrointestinal secretions and 1.2 L of oral intake, totalling 8.2 L of fluid, must be managed daily within the gastrointestinal tract. The small and large intestines reabsorb 8.1 L a day. The remaining 0.1 L is eliminated in feces. In addition to water, electrolytes and minerals are absorbed, and bacteria in the colon synthesize vitamin K and some B-complex vitamins. Finally, feces are formed in the colon for elimination.

Metabolism and Storage of Nutrients. Metabolism refers to all of the biochemical reactions within the cells of the body. Metabolic processes can be anabolic (building) or catabolic (breaking down). **Anabolism** is the production of more complex biochemical substances by synthesis of nutrients. Anabolism occurs when lean muscle is added to the body through diet and exercise. Amino acids are anabolized into tissues, hormones, and enzymes. **Catabolism** is the breakdown of biochemical substances into simpler substances.

► BOX 42-1

Mechanisms for Intestinal Absorption of Nutrients

Mechanism Definition

Active Transport

In this energy-dependent process, particles move from an area of greater concentration to an area of lesser concentration. A special "carrier" is needed to move the particle across the cell membrane.

Passive Diffusion

The force by which particles move outward from an area of greater concentration to lesser concentration constitutes passive diffusion. The particles do not need a special "carrier" to move outward in all directions.

Osmosis

In this process, water moves through a membrane that separates solutions of different concentrations. Water moves to equalize the concentration pressures on both sides of the membrane.

Pinocytosis

Large molecules of nutrients are engulfed by the absorbing cell when the molecule attaches to the absorbing cell membrane.

Data from Nix, S. (2005). *Williams' basic nutrition and diet therapy* (12th ed.). St Louis, MO: Mosby; and Williams, S. D., & Schlenker, E. D. (2011). *Essentials of nutrition and diet therapy* (10th ed.). St Louis, MO: Mosby.

Starvation is an example of catabolism, when wasting of body tissues occurs. Normal metabolism and anabolism are physiologically possible when the body is in positive nitrogen balance, whereas catabolism occurs during physiologic states of negative nitrogen balance.

Nutrients absorbed in the intestines, including water, are transported via the circulatory system to body tissues. Through the chemical changes of metabolism, nutrients are converted into a number of substances required by the body. Carbohydrates, protein, and fat undergo metabolism to produce chemical energy and to maintain a balance between anabolism and catabolism. To carry out the body's work, the chemical energy produced by metabolism is converted to other types of energy. For example, muscle contraction involves mechanical energy, nervous system function involves electrical energy, and the mechanisms of heat production involve thermal energy. All of these forms of energy originate in metabolism.

Nutrient metabolism consists of three main processes:

1. Catabolism of glycogen into glucose, carbon dioxide, and water (**glycogenolysis**)
2. Anabolism of glucose into glycogen for storage (**glycogenesis**)
3. Catabolism of amino acids and glycerol into glucose for energy (**gluconeogenesis**)

Glycogen, synthesized from glucose and stored in small reserves in liver and muscle tissue, provides energy during brief periods of fasting and maintains blood glucose levels as we sleep. Amino acids can be converted to fat and stored or catabolized into energy via gluconeogenesis. All body cells except red blood cells and neurons can oxidize fatty acids into **ketones** for energy in the absence of dietary carbohydrates (glucose). Some of the nutrients required by the body are stored in body tissues. The body's major form of reserve energy is fat, stored as adipose tissue.

Elimination. Chyme is moved by peristaltic action through the ileocecal valve into the large intestine, where it

becomes feces. As feces move toward the rectum, water is absorbed into the intestinal mucosa. The longer the material stays in the large intestine, the more water is absorbed, causing the feces to become firmer. Exercise and fibre stimulate peristalsis. Feces contain cellulose and similar indigestible substances, sloughed epithelial cells from the gastrointestinal tract, digestive secretions, water, and microbes.

Dietary Guidelines

Dietary Reference Intakes. In 1997, the Food and Nutrition Board of the American National Institute of Medicine/National Academy of Sciences, in partnership with Health Canada, developed **dietary reference intakes (DRIs)** with respect to age, sex, pregnancy, and lactation (Atkinson, 2011; Paulionis, 2008). The DRIs present evidenced-informed criteria for an acceptable range of minimum to maximum amounts of nutrients, vitamins, and minerals needed to avoid deficiencies or toxicities. The DRIs have four components: (1) the estimated average requirement (EAR), which is the recommended amount of a nutrient sufficient to maintain a specific body function for 50% of the population based on age and gender; (2) the recommended dietary allowance (RDA), which is the average needs of 98% of the population, not the exact needs of an individual (Murphy et al., 2006); (3) the upper intake level (UL), which is the highest level believed to pose no risk of adverse health events but is not a recommended level of intake (Beaton, 2006); and (4) the adequate intake (AI), which is the suggested intake for individuals based on observed or scientifically determined estimates of nutrient intakes and is used when insufficient evidence exists to set the RDA. Because this evidence is continually evolving, clinicians should consult current resources, such as Health Canada Web pages and other evidence-informed literature, when determining a patient's specific nutrition needs or supplementation.

Food Guidelines. In 1942, Health Canada developed Canada's first food guide, *Canada's Official Food Rules*. Since then, the food guide has undergone many changes in name, appearance, and content. However, its ultimate purpose—to inform daily food choices and promote optimal nutritional health—has not changed (Katamay et al., 2007). The current guide, called *Eating Well With Canada's Food Guide* (Health Canada, 2007b; Figure 42-2), is based on a range of scientific evidence resulting from focus groups, online consultations, regional meetings, and reviews of literature about the environmental context in which Canadians make food choices. Input from stakeholders (e.g., health professional groups, industry) and the public helped to ensure that the recommendations are scientifically sound and address those characteristics of the diet most relevant to the promotion of health and reduction of chronic disease (Health Canada, 2007b).

In developing Canada's Food Guide, food-group composites were used, and once nutrient goals (e.g., RDA, AI) were met for a given food intake pattern, additional testing was done to evaluate the adequacy of varied food choices consistent with the pattern. For example, a bagel, 375 mL of rice, and 30 g of breakfast cereal rather than six servings of a grain composite were used (Murphy & Barr, 2007). Random simulated diets were generated for each of nine age and gender groups. The prevalence of inadequacy was assessed for each nutrient with an EAR. If the prevalence of inadequacy was low, the recommended intake pattern was considered adequate in diets that deviated from the proportions of foods

included in the composites. If the prevalence of inadequacy was high, the food intake pattern was revised. Therefore, most people following the intake pattern listed in Canada's Food Guide have a high probability of meeting their nutritional requirements and a low probability of nutrient excess, even if their individual food choices vary (Katamay et al., 2007; Murphy & Barr, 2007).

Included in the general guidelines of *Eating Well With Canada's Food Guide* are specific suggestions for food choices. Consumers are told to make at least half their grain selections whole grain; eat at least one dark green and one orange vegetable per day; and use vegetables and fruits more than juice, which contains a lower amount of fibre. Lower-fat dairy products, lean meats, and choices from the lower-fat meat group (e.g., legumes, tofu) are suggested. The minimum intake of unsaturated fats is 30 to 45 mL. Two food-guide servings of fish each week are suggested on the basis of evidence relating fish consumption and reduced risk of cardiovascular disease. The Food Guide lists water as a calorie-free way to quench thirst and recommends that community water supplies be fluoridated to the level of 1 mg/L. Recommended intakes and nutritional values according to Canada's Food Guide are shown in Table 42-1.

Canada's Food Guide notes the importance of physical activity in maintaining energy balance and recommends that adults spend 30 to 60 minutes per day carrying out some physical activity and children and youth spend at least 90 minutes per day. The guide provides advice on the use of vitamin and mineral supplementation when the recommended food intake pattern does not ensure adequate amounts. Although not specified in the guide, Canadians are advised to limit salt to "healthy" levels, alcohol to no more than 5% of total energy, and caffeine to no more than 400 mg for the general population, no more than 300 mg (or a little over two 8-oz [237 mL] cups of coffee per day) for women of childbearing age, and no more than 2.5 mg/kg/day for children (Health Canada, 2010b).

Eating Well With Canada's Food Guide has been adapted for First Nations, Inuit, and Métis populations (Health Canada, 2007c). Examples of foods traditional to Canadian Aboriginal populations are wild plants and seaweed in the fruit and vegetable groups, bannock as a grain product, and wild game as a meat alternative. Included in the online Food Guide is a link to a government Web site for advice on limiting exposure to mercury from eating locally caught fish. Instructions are also given for including traditional fats in the diet such as seal and whale oil, ooligan grease, and bacon fat.

In the past, Canada's Aboriginal peoples subsisted on foods obtained from hunting, trapping, fishing, gathering, and agriculture. The resulting diet, high in animal protein and low in fat and carbohydrates, provided adequate energy and nutrients. In replacing traditional foods with contemporary market foods, the current diet of Aboriginal peoples is lower in iron, folacin, calcium, vitamins A and D, fibre, fruit, and vegetables and higher in fat and sugar intakes. Patterns of food consumption are further influenced by issues of **food security** (ability to acquire acceptable foods), preferences in body size, individual taste preferences, availability of particular species for food, knowledge of the nutritional deficits of store-bought food, and modification and contamination of the natural environment. Health problems such as anemia, dental caries, heart disease, obesity, and diabetes are related to such beliefs and dietary practices (Willows, 2005).



Figure 42-2 Extract from *Eating Well With Canada's Food Guide*. Source: From Health Canada. (2007). *Eating well with Canada's food guide* (Catalogue No. H164-38/1-2007E). Ottawa: Author. Retrieved from http://www.hc-sc.gc.ca/fn-an/food-guidealim/index_e.html. Reproduced with permission of the Minister of Public Works and Government Services Canada.

TABLE 42-1

Summary of Recommended Intakes and Nutritional Values According to *Eating Well With Canada's Food Guide*

Vegetables and Fruit		Grain Products		Milk and Alternatives		Meat and Alternatives	
2–3 years of age:	4 servings per day	2–3 years of age:	3 servings per day	2–3 years of age:	2 servings per day	2–8 years of age:	1 serving per day
4–8 years of age:	5 servings	4–8 years of age:	4 servings	4–8 years of age:	2 servings	9–13 years of age:	1–2 servings
9–13 years of age:	6 servings	9–13 years of age:	6 servings	9–13 years of age:	3–4 servings	Girls 14–18 years of age:	2 servings
Girls 14–18 years of age:	7 servings	Girls 14–18 years of age:	6 servings	14–18 years of age:	3–4 servings	Boys 14–18 years of age:	3 servings
Boys 14–18 years of age:	8 servings	Boys 14–18 years of age:	7 servings				
Women 19–50 years of age:	7–8 servings	Women 19–50 years of age:	6–7 servings				
Men 19–50 years of age:	8–10 servings	Men 19–50 years of age:	8 servings	Adults 19–51 years of age:	2 servings	Women 19–50 years of age:	2 servings
Adults 51+ years of age:	7 servings	Women 51+ years of age:	6 servings	Adults 51+ years of age:	3 servings	Men 19–50 years of age:	3 servings
		Men 51+ years of age:	7 servings			Women 51+ years of age:	2 servings
						Men 51+ years of age:	3 servings

Some Important Nutrients in the Food Groups

	Protein	Protein	Protein
Carbohydrate	Carbohydrate	Fat	Fat
Fibre	Fibre	Carbohydrate	
	Thiamin		Thiamin
	Riboflavin	Riboflavin	Riboflavin
	Niacin		Niacin
Folate	Folate		Vitamin B ₆
Vitamin B ₆		Vitamin B ₁₂	Vitamin B ₁₂
Vitamin C			
Vitamin A		Vitamin A	
		Vitamin D	
		Calcium	
	Iron		Iron
	Zinc	Zinc	Zinc
Magnesium	Magnesium	Magnesium	Magnesium
Potassium	Potassium	Potassium	Potassium

Adapted from Health Canada. (2007). *Eating well with Canada's food guide*. Ottawa, ON: Author. Retrieved from http://www.hc-sc.gc.ca/fn-an/food-guide-aliment/index_e.html. Reproduced with permission of the Minister of Public Works and Government Services Canada.

To date, Canada's Food Guide has not been modified to recognize the nutritional concerns of Chinese Canadians or other immigrant groups, although it has been translated into 10 languages. This omission has implications for people living in Toronto, Vancouver, and Montreal since they are the primary destinations for new Canadians (Citizenship & Immigration Canada, 2011). In a study designed to explore the cultural relevance of a fruit-and-vegetable questionnaire for adults from Toronto's Chinese-, Portuguese-, and Vietnamese-speaking communities (Paisley et al., 2005), participants commented on the absence of vegetables and fruits familiar to them. Canada's Food Guide cannot stand alone as a tool to inform new immigrants of healthy eating habits, and consideration should be given to supporting a network of professionals working with new immigrants to promote the sharing of information and

educational techniques (Martineau, 2008). The need for further examples of culturally appropriate foods and portions will, no doubt, be addressed through ongoing revisions to the Food Guide.

The Nutrition Label. Since December 12, 2007, mandatory nutrition labelling consisting of a nutrition facts table listing energy (calories) and 13 nutrients (fat, saturated fat, trans fat, cholesterol, sodium, carbohydrate, fibre, sugars, protein, vitamin A, vitamin C, calcium, and iron) has been required on most prepackaged foods in Canada. This easy-to-read table, which appears on food labels in a consistent appearance, provides consumers with the information necessary to make informed food choices and compare products (Figure 42-3). This information includes (a) the specific amount of the food item that makes up the serving size, an amount that may

Nutrition Facts		
Per 3/4 cup (175g)		
Amount	% Daily Value	
Calories 160		
Fat 2.5 g	4 %	
Saturated 1.5 g	8 %	
+ Trans 0 g		
Cholesterol 10 mg		
Sodium 75 mg	3 %	
Carbohydrate 25 g	8 %	
Fibre 0 g	0 %	
Sugars 24 g		
Protein 8 g		
Vitamin A	2 %	Vitamin C 0 %
Calcium	17 %	Iron 0 %

Figure 42-3 Example of food label. **Source:** Health Canada. (2008). *The nutrition facts table*. Ottawa: Author. Retrieved from <http://www.hc-sc.gc.ca/fn-an/label-etiquet/nutrition/cons/index-eng.php>. Reproduced with the permission of the Minister of Public Works and Government Services Canada.

differ from the Food Guide serving size, and (b) the percent daily value (% DV), a general guideline of how the food's nutrient content contributes to daily diet. It is important to note that the % DV is based on a 2000 calorie/day adult diet and thus does not address recommended nutrient intake for those who are pregnant or breastfeeding. The following diet-related health claims have been established from recognized health and scientific information:

- A healthy diet low in sodium and high in potassium may reduce high blood pressure risk.
- A healthy diet adequate in calcium and vitamin D may reduce the risk of osteoporosis.
- A healthy diet low in saturated fat and trans fat may reduce the risk of heart disease.
- A healthy diet rich in vegetables and fruit may reduce the risk of some types of cancer.

Some other nutrient content claims as regulated by the Canadian government (Canadian Food Inspection Agency, 2011) are the following:

- *Free* indicates that the number of calories or the amount of a nutrient is nutritionally insignificant in a specified amount of food.
- Claims for *saturated fatty acids* include a restriction on levels of both saturated and trans fatty acids.
- The claim (*naming the percent*) *fat-free* is allowed only if accompanied by the statement *low fat* or *low in fat*.
- The nutrient content claim *light* is restricted to foods that meet the criteria for either *reduced in energy* or *reduced in fat*.
- The only nutrient content claims permitted for foods for children under two years of age are *source of protein*, *excellent source of protein*, *more protein*, *no added sodium*, and *no added sugar*.

- A claim of *reduced in energy* or *reduced in calories* is allowed if the item has at least 25% fewer calories than the food to which it is compared.

Nutrition for Health: An Agenda for Action. In 1992, the World Health Organization (WHO) endorsed the World Declaration on Nutrition. This declaration set goals for each country to eliminate starvation and nutritional diseases and disorders (e.g., iodine and vitamin deficiency disorders) and to promote nutritional well-being of all people. Canada responded to this endorsement and devised *Nutrition for Health: An Agenda for Action* (Health Canada, 2002). This document is the combined work of multisectoral groups based on an analysis of Canada's current situation and focused on stimulating and accelerating all sectors to achieve healthier people. The challenge remains to motivate consumers to put the dietary recommendations into practice. For example, although Canadian awareness of trans fat surged from 45% in 1998 to 79% in 2005 (Field, 2008), awareness may not necessarily equate with understanding. An online national survey conducted by the American Heart Association in 2006 found that 84% of survey participants had heard of the term *trans fats*, but 50% of them did not understand the health effects and less than 50% could identify one food from a list as typically containing trans fats. Research is needed to determine the knowledge, attitudes, and behaviour of Canadian consumers to understand if they are translating the message on trans fats and other dietary recommendations into healthier choices. Health providers can play a key role in communicating guidelines to consumers and educating consumers on nutrition labelling.

Nursing Knowledge Base

Nutrition During Human Growth and Development

Infants Through School-Aged Children. Infancy is marked by rapid growth with high protein, vitamin, mineral, and energy requirements. The average (50th percentile) birth weight of a full-term (40-week gestation) Canadian newborn boy is currently 3613 g; that for a Canadian newborn girl, 3470 g (Kramer et al., 2001). The infant usually doubles birth weight at four to five months and triples it at one year. An energy intake of approximately 108 kcal/kg of body weight is needed in the first half of infancy and 98 kcal/kg in the second half (Tontisirin & de Haen, 2001). Commercial formulas and human breast milk both provide approximately 20 kcal/30 mL. A full-term newborn is able to digest and absorb simple carbohydrates, proteins, and a moderate amount of emulsified fat. Spitting up may occur during the first year until the gastroesophageal sphincter (which opens to allow food to enter the stomach and gas to escape after meals) matures and the child learns to sit independently (Hobbie et al., 2000). Infants need 100 to 150 mL/kg per day of fluid because a large portion of their total body weight is water.

Breastfeeding. The Canadian Paediatric Society Nutrition Committee, Dietitians of Canada, and Health Canada (Joint Working Group, 1998; reaffirmed February 2008) recommend breastfeeding as the optimal method of infant feeding. Breastfeeding confers immunological and allergy protection to the infant during the period of breastfeeding, is economical and convenient (breast milk is always fresh and at the correct temperature), and provides an excellent opportunity for mother and infant to interact (Health Canada, 2004a). Health Canada (2004a) and WHO (2001) recommend the exclusive use

of breast milk for the first six months of the infant's life. Breast-fed infants need supplemental vitamin D because breast milk has only 1 to 10 IU/250 mL (Health Canada, 2004b), or 60% of the vitamin D needed by infants under one year of age. Other vitamin or mineral supplementation is not recommended for the first six months (Health Canada, 2004b).

In 2007–2008, 87.9% of Canadian mothers breastfed or tried to breastfeed their last child (Health Canada, 2010a). The percentage of mothers who tried breastfeeding in the Atlantic Provinces and Quebec was significantly lower than the national average, while the breastfeeding initiation rate in British Columbia was significantly higher. The initiation rate increased with increasing age (e.g., fewer mothers aged 15 to 24 [82.9%] initiated breastfeeding than did mothers aged 35 to 55 [89.2%]); married and common-law status (89.4%) compared to widowed, separated, divorced, or single status (79.7%); residing in urban areas (88.7%) compared to rural areas (81.5%); and being of Asian (96.2%), Black (95.7%), or other, including Arab, West Asian, Latin American, other racial/cultural origin or multiple racial/cultural origin (93.5) ethnic or racial background compared to White (86.3%) or Aboriginal (81.5%). Despite these overall high initiation rates, by six months the Canadian rate for exclusive breastfeeding was at 18.7%, although 54% still offered some breastfeeding. To strengthen successful breastfeeding in Canada, health practitioners are encouraged to promote immediate mother–infant contact, exclusive breastfeeding, and on-demand feeding (Chalmers et al., 2009).

Formula. Commercially prepared infant formulas, cow's milk-based and iron fortified, are designed to contain the approximate nutrient composition of human milk. Protein in the formula is typically supplied as whey, soy, cow's milk base, casein hydrolysate, or elemental amino acids. The composition, processing, packaging, and labelling of all infant formulas are regulated under Canadian food and drug laws. Research shows that differences in the way certain constituents within formulas are absorbed may influence optimal growth and development. Infants fed formulas containing total potentially available nucleosides (TPAN), which prevent suppression of the immune system, increase resistance to some bacterial and fungal pathogens, and reduce the risk of diarrhea, experienced the same gastrointestinal tolerance as those receiving human milk (Health Odyssey International, 2008). Infants who were fed formulas containing palm and palm olein (PO) oils as the main source of fat excreted more calcium in their stools and had significantly lower bone mineral content than did infants fed the PO-free formula. Specialty formulas are indicated for infants with detected or suspected pathology. Health providers caring for new mothers and their infants can address mothers' concerns about infant formulas and help them make informed choices when selecting the best substitute for human milk.

Regular cow's milk should not be used in infant formula before 9 to 12 months of age because it may cause gastrointestinal bleeding, is too concentrated for the infant's kidneys, increases the risk of milk product allergies, and is a poor source of iron and vitamins C and E (Schlenker & Long, 2011). Honey is a potential source of botulism toxin and should not be used in the infant's diet, as the toxin can be fatal in children under one year of age (Schlenker & Long, 2011).

Introduction to Solid Food. Breast milk or formula provides sufficient nutrition for the first six months of the infant's life. After that, solids are introduced to meet the infant's nutrient needs, specifically, iron, zinc, and vitamin A.

Cues indicating readiness for solid foods are the appearance of fine motor skills of the hand and fingers, hand-to-mouth movement, interest in adult food and self-feeding, increased milk consumption, ability to move food to the back of the mouth, and ability to sit alone in a high chair. Puréed smooth foods are typically the first semi-solid food to be introduced to an infant. The addition of foods to an infant's diet should be governed by the infant's nutrient needs and physical readiness to handle different forms of foods and by the need to detect and control allergic reactions. New foods should be introduced one at a time, early in the day, at two-day intervals, or four to seven days apart if the child is known to have allergies (Alberta Health and Wellness, 2008). It is best to introduce new foods before milk or other foods to avoid infant rejection due to satiety (Health Canada, 2005b).

The growth rate slows during toddler years (ages one to three years). The toddler needs fewer kilocalories but an increased amount of protein in relation to body weight; consequently, appetite may decrease at about 18 months of age. Toddlers exhibit strong food preferences and become picky eaters. Small, frequent meals consisting of breakfast, lunch, and dinner, with three interspersed, nutrient-dense snacks, may improve nutritional intake (Hockenberry, 2004). Calcium and phosphorus are important for healthy bone growth. Whole milk should be used until the toddler reaches two years of age to help ensure adequate intake of fatty acids for brain and neurological development. Toddlers and preschoolers need vitamin D supplementation until their diet includes at least 10 mcg (400 IU) per day of vitamin D from other dietary sources (i.e., drinking two cups of milk daily and eating one to two servings of fish weekly). Toddlers who consume more than 720 mL of milk daily in lieu of other foods may develop milk anemia, as milk is a poor source of iron.

The oral health of infants and children needs to be focused on preventing cavities. Children who sleep with a bottle are at particular risk of developing early childhood tooth decay (ECTD), a severe type of tooth decay that can affect baby teeth, especially the upper front teeth. The sugars from the milk, juice, and drinks left in the mouth combine with bacteria in plaque to create an acid that damages the enamel of a tooth. The longer and more often food is left in the mouth, the greater the chance of developing ECTD (Health Canada, 2005c). Dental visits should begin within six months of the eruption of the first tooth or by one year of age at the latest. From the age of three years, twice-yearly dental inspections are recommended. Children under three years of age should have their teeth brushed by an adult, and parents need to supervise children less than six years of age during brushing (Canadian Dental Association, 2005).

Preschoolers' (three to five years old) dietary requirements are similar to those of toddlers. They consume slightly more than toddlers, and nutrient density is more important than quantity. Encouragement of healthy eating is an important goal of parenting, and parents should try to use attractive food presentations and fun, educational initiatives rather than unhealthy food as a reward (Alphabet Soup, 2005; Tucker et al., 2006). Because preschoolers have small stomachs, they need to eat small amounts of food more often throughout the day. One Food Guide serving from a food group can be divided into smaller amounts and served throughout the day. For example, half a serving of Meat and Alternatives may be served at two different meals such as one egg at lunch and about 30 g (1 oz) of chicken for dinner (Health Canada, 2011a).

safety alert Foods such as hot dogs, candy, gum, cough drops, raisins, sunflower seeds, fish with bones, peanuts, peanut butter, marshmallows, nuts, grapes, raw vegetables, popcorn, and fruit gel snacks have been implicated in choking deaths of preschoolers and toddlers and should be avoided or prepared in a safe manner (Qureshi & Mink, 2003; Shah et al., 2010).

School-aged children, 6 to 12 years old, grow at a slower and steadier rate, with a gradual decline in energy requirements per unit of body weight. The school-aged child gains 3 to 5 kg in weight and 6 cm in height per year until puberty. Despite better appetites and more varied food intake, school-aged children's diets should be carefully assessed for adequate protein and vitamins A and C. School-aged children frequently fail to eat a proper breakfast and have an unsupervised food intake at school. High amounts of fat, sugar, and salt can result from a liberal intake of commercially prepared snack foods.

Inappropriate nutrition may play an important role in childhood obesity. The prevalence of childhood obesity in Canada has increased by 200% to 300% between 1981 and 2001 (Starky, 2005). Data from the 2004 Canadian Community Health Survey (Statistics Canada, 2006) showed that 59% of Canadian children do not consume adequate fruits and vegetables and that these children are significantly more likely to be overweight and obese than those children who consume the recommended amounts of fruits and vegetables. In Prince Edward Island, Aboriginal children were found to not consume the minimum number of fruit and vegetable servings, and less than half of the 55 children in the study sample consumed the minimum number of milk products daily (Taylor et al., 2007). Currently, 18.1% of all Canadian children are classified as overweight and an additional 8.2% as obese (Statistics Canada, 2006). Children who live in Atlantic Canada are twice as likely to be overweight as children in the Prairie Provinces (Willms et al., 2003). In First Nation communities, the prevalence of pediatric and adolescent obesity is much higher (Kuperberg & Evers, 2006).

Considerable health risks are associated with being overweight or obese, including type 2 diabetes, sleep apnea, cardiovascular disease, gallbladder and liver disease, certain types of cancers, hypertension, osteoarthritis, and hypercholesterolemia (Starky, 2005). These diseases and disorders, traditionally limited to adults, are manifesting in Canadian youth (Tremblay, 2003). The prevention and treatment of obesity in childhood and adolescence is a critical public health issue and, ultimately, an important determinant of long-term health. Obesity-prevention strategies recommended by family physicians include initiating obesity prevention during pregnancy, using a family-oriented approach, and encouraging increased physical activity and less television viewing (Plourde, 2006). Evidence suggests also that school interventions may reduce childhood obesity and that the role of parents in this area is critical (Mendelson, 2007).

Nurses who work with children with type 2 diabetes need to be aware of the many implications such a diagnosis can have on a child. Beyond the illness and treatments, these children experience difficult emotions and face issues of identity, autonomy, and belonging—all requiring a sensitive approach. The story in Box 42-2 conveys a nurse's experiences with an adolescent boy who received a diagnosis of diabetes.

Adolescents. During adolescence, physiological age is a better guide to nutritional needs than chronological age.

Energy needs to increase to meet the greater metabolic demands of growth. The daily requirement of protein also increases. Calcium and vitamin D are essential for the rapid bone growth that occurs during adolescence, and girls need a continuous source of iron to replace menstrual blood losses. Boys also need adequate iron for muscle development. In addition to meats and fish, greens, nuts, dried fruits, and whole grains are iron-rich foods (College of Family Physicians of Canada, 2007). Iodine supports increased thyroid activity, so it is important that adolescents use iodized table salt to ensure adequate intake. B-complex vitamins are needed to support heightened metabolic activity.

The adolescent's diet is influenced by many factors other than nutritional needs, including concern about body image and appearance, desire for independence, and fad diets. Nutritional deficiencies may occur in adolescent girls as a result of dieting (Adolescent Health Committee, Canadian Pediatric Society, 2004; reaffirmed 2008) and use of oral contraceptives (Brown et al., 2005). Adolescent girls 14 to 18 years old were found to have inadequate intakes of vitamin B₆, vitamin B₁₂, folate, zinc, iron, magnesium, phosphorus, and vitamin A. Their median calcium, potassium, and fibre intakes were below the adequate intake (AI) level (Health Canada, 2010c). The adolescent boy's diet may be inadequate in vitamin A and magnesium.

Snacks provide approximately 25% of teenagers' total dietary intake. The consumption of fast foods has been associated with excess weight gain, which may be related to the higher energy and fat content of most of these foods. More than 80% of Canadian adolescents report sodium intakes in excess of the upper intake level (UL)—the intake level beyond which the risk of adverse health effects increases (Health Canada, 2010c). Fast-food restaurants also offer larger portions of food, and consumers are eating greater amounts (Wansink et al., 2007). To counteract this trend among adolescents, health promotion initiatives are being implemented in schools to develop supportive environments for healthier eating (e.g., reducing the availability of junk foods in school cafeterias and in vending machines).

The onset of eating disorders such as **anorexia nervosa** or **bulimia nervosa** often occurs during early adolescence when individuals are establishing independence and autonomy. Dieting and weight control are viewed as a defence for feelings of inadequacy or ineffectiveness. In later adolescence, when facing the task of separation-individualization, similar conflicts may arise (Weaver, 2010). Recognition of eating disorders is essential for early intervention (Table 42-2).

Sports and regular exercise necessitate dietary modification to meet the increased energy needs of adolescents. Carbohydrates, both simple and complex, are the main source of energy. Protein needs increase to 1.0 to 1.5 g/kg per day; fat needs do not increase. All athletes need to ingest water before and after exercise to prevent dehydration, especially in hot, humid environments. It is not necessary to supplement the diet with vitamins and minerals, but intake of iron-rich foods is required to prevent anemia (Croll et al., 2006) and calcium with vitamin D to prevent stress fractures (Lappe et al., 2008).

Parents often have more influence over the adolescent diet than they believe they have. Effective strategies include limiting the amount of unhealthy foods kept at home and enhancing the appearance and taste of healthy foods. Making healthy foods more convenient and available and working to change social norms that determine what foods are "cool" are other

BOX 42-2 NURSING STORY

Counselling Children About Nutrition*

Michael was a 13-year-old boy admitted to our pediatric unit with a new diagnosis of type 2 diabetes mellitus. As his nurse, I completed the admission assessment, including height, weight, and baseline vital signs. These values were plotted on a growth chart and it was determined that Michael was also dealing with obesity, which would make nutrition counselling a priority.

I accompanied Michael and his mother to the diabetic clinic to provide ongoing support since we had established a therapeutic relationship. Initially, Michael displayed signs of anger and frustration with his diagnosis; he shared feelings of isolation, being different, and not being accepted by his peers. "Having diabetes will just make things worse. Nobody else has to worry about what they eat or when they eat." Michael needed help acknowledging his feelings and with understanding type 2 diabetes so he could begin to gain control over his health.

Our first goal was for Michael to explore his feelings regarding food. We needed him to think about when, where, and with whom he eats. From there, we would explore his food choices. This was a critical starting point to a process that exposed many difficult emotions for a 13-year-old boy. Irritated and constantly feeling "sick and tired," he was ready to feel better. Michael appreciated that he needed to understand type 2 diabetes and the health challenges that could be incurred if he did not make changes. With the use of illustrations and some relevant YouTube videos, Michael was able to articulate what was happening in his body and what that meant for him.

Our next goal was for Michael to appreciate the value of proper nutrition in controlling blood sugars. Again, using images, Michael was able to understand and describe in his own words the role of protein, fats, and carbohydrates in his body's metabolism. He quickly grasped the significance of counting carbohydrates, concluding that in order to

feel better, he would need to expand his food choices within the recommended guidelines of *Eating Well With Canada's Food Guide*. He further described that one of the strategies he used to fit in with his peers was unhealthy choices such as McCain Pizza Pockets and garlic fingers. He was afraid to change his eating habits as he did not want to appear different from his friends. We explored the potential that making healthy choices could be viewed as being "cool" and discussed his becoming a leader for change among his family and peers.

At this point, we shifted the goal setting to include family initiatives. Michael's mother voiced her frustrations about her busy lifestyle, having two children who refuse to eat fruits and vegetables, and the limitation of a single income. We discussed the importance of fruits and vegetables in relation to blood sugar monitoring and weight. The clinic dietitian encouraged Michael to take a more active role in meal preparation at home to feel more in control of the food being served. The dietitian referred Michael and his mother to "diabetes-friendly" recipes, including fruit smoothies and vegetable wraps, which were an instant success. We talked with Michael about helping his mother with the grocery shopping so they could practise label reading and portion sizes together.

Michael agreed to try these strategies and accepted as a goal to try one new fruit and one new vegetable each day along with incorporating some physical activity into his day. He shared that cutting out screen time would be difficult as he uses that activity for connecting with his peers; we agreed cutting down on screen time would be more appropriate. He began to journal his experience, an activity that included reflections on his food choices and eating environment. At follow-up visits, Michael proudly shared his progress, pleased that he was "beginning to feel more like a 13-year-old—I've even gotten back on my bike!" Michael shared his gratitude for the opportunity to unpack his feelings of isolation and unworthiness and for helping him learn how to take control of his health and wellness.

*By Beverly Gaudet, RN, MN.

ways to promote optimal nutritional health among adolescents (Contento et al., 2006).

Pregnancy occurring within four years of menarche may place the mother and fetus at risk because of the mother's anatomical and physiological immaturity. Malnutrition at the time of conception increases risk to the adolescent and her fetus. Most teenage girls do not want to gain weight, thus counselling adolescent girls on the nutritional needs associated with pregnancy may be difficult; suggestions are better tolerated than rigid directions. The diet of pregnant adolescents is often deficient in calcium, iron, and vitamins A and C. Prenatal vitamin and mineral supplements are recommended.

Young and Middle-Aged Adults. The demands for most nutrients are reduced as the growth period ends. Adults need nutrients for energy, maintenance, and repair, although their energy needs usually decline over the years. Obesity may become a problem as a result of decreased physical exercise, frequent dining out, and the increased ability to afford more luxury foods. Women who use oral contraceptives may need extra vitamins. Iron and calcium intake continues to be important.

Maintaining good oral health is important throughout adulthood. Poor oral hygiene and periodontal disease are potential risk factors for systemic diseases such as bacteremia, endocarditis, cardiopulmonary disease, diabetes mellitus, and for adverse outcomes in pregnancy (WHO, 2008).

Pregnancy. Nutrition during pregnancy influences birth weight and survival chances in infants. Generally, the fetus's needs are met at the expense of the mother. If nutrient sources are not available, both will suffer. The nutritional status of the mother at the time of conception is important because significant aspects of fetal growth and development often occur before pregnancy is suspected.

The energy requirements associated with pregnancy are related to the mother's body weight and activity levels. Pregnant women need 100 kcal per day above the usual allowance during the first trimester and approximately 300 extra calories per day in the second and third trimesters. The additional nutrients should be obtained by including an extra two to three Food Guide Servings from any of the four food groups daily (Health Canada, 2007b). It is recommended that pregnant women have at least 150 g of cooked fish each week to ensure omega-3 fats and other important nutrients and take a multi-vitamin containing 0.4 mg of folic acid and 16 to 20 mg of iron every day (Health Canada, 2011b). Rigid recommendations about weight gain should be avoided because the quality of nutrition during pregnancy is more important than weight gain per se or than the number of kilocalories consumed per day.

Calcium intake is especially critical during the third trimester, when fetal bones are mineralized. Iron may be supplemented to provide for increased maternal blood volume, fetal

► TABLE 42-2

**Potential Assessment
for Eating Disorders****Anorexia Nervosa**

- A. Body weight not maintained over a minimal normal weight for age and height, (e.g., weight loss leading to maintenance of body weight <85% of ideal body weight [IBW]); or failure to make expected weight gain during period of growth, leading to body weight <85% of that expected.
- B. Intense fear of gaining weight or becoming fat, although underweight.
- C. Disturbance in the way in which one's body weight, size, or shape is experienced (e.g., the person claims to "feel fat" even when obviously underweight).
- D. In females, absence of at least three consecutive menstrual cycles when otherwise expected to occur (amenorrhea). (A woman is considered to have amenorrhea if her periods occur only following hormone administration.)

Bulimia Nervosa

- A. Recurrent episodes of binge eating (rapid consumption of a large amount of food in a small period of time).
- B. A feeling of lack of control over eating behaviour during the eating binges.
- C. The person regularly engages in either self-induced vomiting, use of laxatives or diuretics, strict dieting or fasting, or vigorous exercise in order to prevent weight gain.
- D. A minimum average of two binge eating episodes a week for at least three months.

Source: American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text revision). Washington, DC: Author. Copyright 2000, American Psychiatric Association. Reprinted with permission.

blood storage, and maternal blood loss during delivery. Iodine needs increase 15% to 17% because of increased activity of the thyroid gland. Folic acid intake is particularly important for DNA synthesis and the growth of red blood cells. Inadequate intake may lead to fetal neural tube defects, anencephaly, or maternal megaloblastic anemia (Schlenker & Long, 2011). Health care providers, however, should not advise higher doses of folic acid than prescribed amounts because this may promote the development of colon cancer when preneoplastic cells are present (Kim, 2007; Smith et al., 2008) and the risk of asthma, obesity, and insulin resistance in offspring (Mackerras et al., 2010; Whitrow et al., 2009). Other supplements may also have health risks. For example, vitamin A is essential to maternal and fetal health but is teratogenic (harmful to embryo or fetal growth and development) when consumed in excess (Schlenker & Long, 2011).

Pregnant women should drink at least eight glasses of water daily. They should also avoid artificial sweeteners, alcohol, excessive caffeine, and all drugs not specifically ordered, as these substances pass through the placenta and affect the growing baby. Adequate fluid and fibre intake and moderate exercise help prevent constipation, which is commonly associated with pregnancy in response to the growing uterus, pregnancy hormones, and iron supplementation.

Lactation. Lactating women need 500 kcal per day above the usual allowance because the production of milk increases energy requirements. *Eating Well With Canada's Food Guide* suggests that lactating women ingest the same nutrient levels as

*** BOX 42-3 FOCUS ON OLDER ADULTS****Factors Affecting Nutritional Status**

- Age-related gastrointestinal changes that affect digestion of food and maintenance of nutrition include changes in the teeth and gums, reduced saliva production, atrophy of oral mucosal epithelial cells, increased taste threshold, decreased thirst sensation, reduced gag reflex, and decreased esophageal and colonic peristalsis (Brownie, 2006).
- Presence of other diseases, such as diabetes and cognitive impairments related to delirium, dementia, and depression, increase risk of poor nutrition (Green & Watson, 2006).
- Malnutrition in older adults has multiple causes, such as low income, low educational level, lack of physical functional level to meet activities of daily living, loss, dependency, loneliness, and lack of transportation (Payette & Shatenstein, 2005).
- Nutrition awareness and motivation may be poor: older adults may not read food labels or understand the nutrient value of foods (van Dillen et al., 2008).
- Medications may have adverse effects such as causing anorexia (loss of appetite), xerostomia (severe dryness of the mouth), early satiety, and impaired smell and taste perception. Older adults are more likely to be prescribed medications than younger individuals (Kinosian & Knight-Klimas, 2009).
- Intake of calcium, vitamin D, and phosphorus may be deficient, increasing the risk for osteoporosis. Vitamin B₁₂ may not be synthesized because of lack of intrinsic factor (glycoprotein necessary for the absorption of vitamin B₁₂) in the terminal ileum, decreased lean muscle mass, and lower basic energy expenditure (Masse et al., 2004).

recommended during pregnancy. The need for calcium remains the same as during pregnancy, but lactating women require additional vitamins A and C. Daily intake of water-soluble vitamins (B and C) is needed to ensure adequate levels in breast milk. Fluid intake should be adequate but need not be excessive. Caffeine, alcohol, and drugs are excreted in breast milk and thus should be avoided. It is recommended that nursing be postponed by at least one hour after consuming an alcoholic drink, as it takes an adult woman (55 kg) about 1.25 hours to metabolize the 10 g of alcohol contained in the average drink (Health Canada, 2007a). Tobacco use can decrease the mother's milk production (Einarson & Riordan, 2009).

Older Adults. Adults aged 65 years and older have a decreased need for energy because the metabolic rate slows with age. However, vitamin and mineral requirements remain unchanged from middle adulthood.

Many factors influence the nutritional status of older adults (Box 42-3). Income is significant because for those living on a fixed income, the amount of money available to buy food may be reduced. A large number of older patients benefit from home-delivered or congregate meal services. Health status is another important factor. The older adult may be following a therapeutic diet; have difficulty eating because of physical symptoms, lack of teeth, or dentures; or be at risk for drug-nutrient interactions (Table 42-3). Thirst sensation may diminish, leading to inadequate fluid intake or dehydration (see Chapter 39). Meats may be avoided because of the cost or difficulty to chew. Cheese, eggs, and peanut butter are useful

► TABLE 42-3 Sample Nutrient-Drug Interactions*

Drug	Effect
Analgesic	
Acetaminophen	Decreased drug absorption with food; overdose associated with liver failure
Aspirin	Absorbed directly through stomach; decreased drug absorption with food; decreased folic acid, vitamins C and K, and iron absorption
Antacid	
Aluminum hydroxide	Decreased phosphate absorption
Sodium bicarbonate	Decreased folic acid absorption
Anti-Arrhythmic	
Amiodarone	Taste alteration
Digitalis	Anorexia; decreased renal clearance in older persons
Antibiotic	
Penicillins	Decreased drug absorption with food; taste alteration
Cephalosporin	Decreased vitamin K
Rifampin	Decreased vitamin B ₆ , niacin, vitamin D
Tetracycline	Decreased drug absorption with milk and antacids; decreased nutrient absorption of calcium, riboflavin, vitamin C due to binding
Trimethoprim/ sulfamethoxazole	Decreased folic acid
Anticoagulant	
Coumarin	Acts as antagonist to vitamin K
Anticonvulsant	
Carbamazepine	Increased drug absorption with food
Phenytoin	Decreased calcium absorption; decreased vitamins D and K and folic acid; taste alteration; decreased drug absorption with food
Antidepressant	
Amitriptyline	Appetite stimulant
Clomipramine	Taste alteration; appetite stimulant
Fluoxetine (selected serotonin reuptake inhibitor [SSRI])	Taste alteration; anorexia
Bupropion (monoamine oxidase inhibitor [MAOI])	GI upset and weight loss
Antihypertensive	
Capropril	Taste alteration; anorexia
Hydralazine	Enhanced drug absorption with food; decreased vitamin B ₆
Labetalol	Taste alteration (weight gain for all β -blockers)
Methyldopa	Decreased vitamin B ₁₂ , folic acid, iron
Anti-Inflammatory	
All steroids	Increased appetite and weight; increased folic acid; decreased calcium (osteoporosis with long-term use); promotes gluconeogenesis of protein
Anti-Parkinson	
Levodopa	Taste alteration; decreased vitamin B ₆ ; and decreased drug absorption with food
Antipsychotic	
Chlorpromazine	Increased appetite
Thiothixene	May increase the excretion of riboflavin, which over time decreases the level of riboflavin in the body
Bronchiodilator	
Albuterol sulphate	Appetite stimulant
Theophylline	Anorexia

*Not intended to be an exhaustive or all-inclusive list. Always check pharmacology references before administering medications.

Data from McKenry, L. M., & Salerno, E. (2003). *Mosby's pharmacology in nursing* (21st revised ed.). St Louis, MO: Mosby. "Nutrient-drug interactions." (2006). *Nutrition and well-being A to Z*. Retrieved January 19, 2009, from <http://www.faq.s.org/nutrition/Met-Obe/Nutrient-Drug-Interactions.html>; and Kinosian, B. P., & Knight-Klimas, T. (2009). 22 Drug-nutrient interactions in the elderly In J. I. Boullata & V. T. Armenti (Eds.), *Handbook of drug-nutrient interactions* (2nd ed., pp. 617-664). New York: Humana Press/Springer.

► TABLE 42-3 Sample Nutrient-Drug Interactions—cont'd

Drug	Effect
Cholesterol Lowering	
Cholestyramine	Decreased fat-soluble vitamins (A, D, E, K); vitamin B ₁₂ ; iron
Diuretic	
Furosemide	Decreased drug absorption with food
Spironolactone	Increased drug absorption with food
Thiazides	Decreased magnesium, zinc, and potassium
Laxative	
Mineral oil	Decreased absorption of fat-soluble vitamins (A, D, E, K), carotene
Platelet Aggregate Inhibitor	
Dipyridamole	Decreased drug absorption with food
Potassium Replacement	
Potassium chloride	Decreased vitamin B ₁₂
Tranquillizer	
Benzodiazepines	Increased appetite

► TABLE 42-4 Religion-Based Dietary Restrictions and Guidelines

Islam	Christianity	Hinduism	Judaism	Church of Jesus Christ of Latter-Day Saints (Mormons)	Seventh-Day Adventists
Pork	Minimal or no alcohol	All meats	Pork	Alcohol	Pork
Alcohol		Alcohol	Predatory fowl	Tobacco	Shellfish
Caffeine	Holy-day observances	Onions	Shellfish (eat only fish with scales)	Caffeine	Alcohol
Emulsifiers made from animal fats, especially margarines	may restrict meat	Garlic	Rare meats	Limit meat	Vegetarian diet encouraged
Ramadan fasting sunrise to sunset for one month			Blood (blood sausage, etc.)		
Ritualized methods of animal slaughter required for meat ingestion			Do not mix milk or dairy products with meat dishes		
			Must adhere to kosher food preparation methods		
			24 hours of fasting on Yom Kippur, a day of atonement		
			No leavened bread eaten during Passover (eight days)		
			No cooking on the Sabbath (Saturday)		

high-protein alternatives. Cream soups and meat-based vegetable soups are nutrient-dense sources of protein; yet, commercial soups and packaged meats contain a high salt content. Milk continues to be an important food for older adults to protect against osteoporosis (a decrease of bone-mass density). Although research has shown that older men lag behind women by approximately a decade in developing osteoporosis, screening and treatment are necessary for both older men and women (Schlenker & Long, 2011). The diets of older adults should contain choices from all food groups and may require a vitamin and mineral supplement.

Alternative Food Patterns

Many people follow special patterns of food intake that are based on religion (Table 42-4), cultural background (Box 42-4)

ethics, health beliefs, personal preference, or concern for the efficient use of land to produce food. Such special diets are not necessarily more or less nutritious than diets based on *Eating Well With Canada's Food Guide* or other nutritional guidelines because good nutrition depends on a balanced intake of all required nutrients.

Vegetarian Diet. Vegetarianism is the consumption of a diet consisting predominantly of plant foods. Vegetarians may be ovo-lacto vegetarians (avoid meat, fish, and poultry but eat eggs and milk), lacto-vegetarians (drink milk but avoid eggs), or vegans (consume only plant foods). Vegetarian diets often have lower levels of total fat, saturated fat, and cholesterol than many meat-based diets, and higher intakes of fibre, magnesium, potassium, folate, and antioxidants such as vitamins C and E. Because of this, vegetarian diets may lead to

* BOX 42-4 CULTURAL ASPECTS OF CARE

Nutrition

Food patterns developed as a child, through habits and culture, interact to influence food intake. Culture also influences the meaning of food not related to nutrition. Eating is associated with sentiments and feelings such as "good" and "bad." For example, children are often rewarded for "being good" with a treat such as candy. They then associate candy with "being good."

The incidence of lactose intolerance around the world occurs in the following ethnic or racial groups: Asian-Pacific, African and African American, Native American, Mexican American, Middle Eastern, and Whites. This condition affects nutrient absorption, and calcium deficiency results. The theory of "hot" and "cold" foods predominates in many cultures. The foundation of the theory is that to keep harmony with nature, one must balance "cold," "hot," "wet," and "dry." Some cultures believe hot characterizes warmth, strength, and reassurance, whereas cold represents menace and weakness. Classification of a food has nothing to do with spiciness but is a symbolic representation of temperature.

Source: Adapted from Giger, J. N., & Davidhizar, R. E. (2004). *Transcultural nursing: assessment and intervention* (3rd ed.). St Louis, MO: Mosby.

Implications for Practice

- Identify the meaning that certain types of food have for each patient.
- Lactose and other food intolerances unique to specific cultures require diet adaptation to meet nutrient, mineral, and vitamin daily-intake requirements.
- In some cultures, specific conditions require hot foods. Menstruation, cancer, pneumonia, earache, colds, paralysis, headache, and rheumatism are "cold" illnesses requiring hot foods (e.g., rice, grain cereals, alcohol, beef, lamb, chili peppers, chocolate, cheese, temperate-zone fruits, eggs, peas, goat's milk, corn husks, oils, peanuts, onions, pork, radishes, tamales).
- Other conditions, such as pregnancy, fever, infections, diarrhea, rashes, ulcers, liver problems, constipation, kidney problems, and sore throats, are "hot" conditions requiring cold foods (e.g., beans, citrus fruits, tropical fruits, dairy products, most fresh vegetables, honey, raisins, chicken, fish, and goat meat).



lower blood pressure, improved cholesterol levels, healthier weight, and less incidence of type 2 diabetes, all of which can reduce the risk of heart disease and stroke (Barnard et al., 2009; Heart and Stroke Foundation, 2008).

Dietitians of Canada and the American Dietetic Association further maintain that appropriately planned vegetarian diets can help prevent prostate and colon cancer (Mangels et al., 2003). Yet, knowledge related to complementary use of complete and incomplete proteins, food sources of vitamin B₁₂ (e.g., fortified breakfast cereal and soy milk), and nondairy sources of calcium is necessary (Messina et al., 2003). Vegan, Zen macrobiotic (consisting primarily of brown rice, other grains, and herb teas), and fruitarian (consisting of only fruit, nuts, honey, and olive oil) diets can be nutrient poor and can result in malnutrition. Children who follow a vegetarian diet are especially at risk for protein and vitamin deficiencies such as vitamin B₁₂ (Mangels et al., 2003; Stabler & Allen, 2004). Canadian adolescent girls and women of reproductive age who are vegetarian are at greater risk for low iron stores because diets high in plant foods contain dietary iron inhibitors (Cooper et al., 2006). Vegetarian athletes at risk for low intakes of energy, protein, fat, and key micronutrients such as iron, calcium, vitamin D, riboflavin, zinc, and vitamin B₁₂ may need consultation with a sports dietitian (Rodriguez et al., 2009).

Vegetarian diets may include:

1. Semi or partial-vegetarian: May eat some milk products, eggs, poultry, and fish while primarily consuming plant-based foods
2. Pesco-vegetarian: May eat fish, eggs, dairy products, grains, vegetables, fruits, legumes, seeds, nuts while avoiding meat and poultry
3. Lacto-ovo-vegetarian: Eating eggs, dairy products, grains, vegetables, fruits, legumes, seeds, nuts while avoiding meat, poultry, and fish
4. Lacto-vegetarian: Eating dairy products, grains, vegetables, fruits, legumes, seeds, nuts while avoiding meat, fish, poultry, and eggs
5. Vegan: Eating grains, vegetables, fruits, legumes, seeds, nuts while avoiding meat, fish, poultry, eggs, dairy, and honey

In general, plant-based diets are low in saturated fat and cholesterol and high in fibre, folate, vitamin C and E, potassium, and magnesium. Health Canada (2011) instructs those who follow vegetarian diets to ensure adequate nutrient intake by choosing "either milk or fortified soy beverages as part of the Milk and Alternatives food group" and various meat alternatives such as "beans, lentils, eggs, tofu, soy-based meat substitutes, nuts, nut butters and seeds from the Meat and Alternatives food group."

Calcium deserves special attention in vegetarian food guidelines because women practicing vegan and even lacto-ovo-vegetarian diets may have inadequate calcium intakes (Messina, Melina & Mangels, 2003). A major criticism of using Canada's Food Guide for vegetarian diet planning is that soymilk is the only vegan milk alternative mentioned. In addition to fortified soy drinks and products (e.g., soy yogurts, tofu), good vegan sources of calcium include navy beans and white beans; nuts and nut products like almonds and almond butter; seeds like sesame seeds and their butter (tahini); blackstrap molasses; vegetables such as bok choy, okra, collard greens and turnip greens, and fruits like figs and fortified orange juice (Dietitians of Canada, 2010).

The healthy vegan diet must also ensure adequate protein, iron, zinc, and vitamins D and B₁₂ (Amit et al., 2010). As a general rule, our bodies need approximately 0.8 grams of protein for every kilogram of body weight. This means that a person weighing 60 kg requires approximately (60 kg × 0.8) or 48 grams of protein daily. The lower digestibility of plant proteins may however necessitate increased protein intake for infants and children (Messina & Mangels, 2001). Sources of protein include soy and soy products; meat alternatives (e.g., textured vegetable protein and veggie burgers); dried beans (e.g., kidney, black and white beans), peas (e.g., chickpeas and black-eyed peas), and lentils (e.g., red, brown and green lentils); and grains, nuts and seeds (Dietitians of Canada, 2010). For children under the age of five, certain high-protein foods such as whole nuts or seeds are to be avoided as they represent a choking risk (Ministry of Health, 2012). A range of plant protein products are needed because particular amino

acids that are abundant in some foods may be limited in other foods and vice versa. By consuming a wide variety of foods, the amino acids “complement” each other to provide the essential amino acids in proper balance.

Vegan iron sources include the above protein sources, specifically firm or extra firm tofu, pinto and adzuki beans, almonds, and sesame seeds (Dietitians of Canada, 2010). Iron is additionally found in fruits such as prunes, raisins and apricots; dark green vegetables such as collards, okra and bok choy; and blackstrap molasses (Dietitians of Canada, 2010). The form of iron present in foods of plant origin is not well absorbed by the body; its rate of absorption can be increased up to six times by incorporating foods high in vitamin C (University of Western Ontario Hospitality Services). Zinc is found in soy products; dried beans, peas and lentils; nuts such as peanuts, pecans, and cashews and seeds such as pumpkin and flax; whole grains and fortified cereals.

Unsupplemented vegan diets do not provide Vitamin B12. It is recommended that all people over the age of 50, regardless of type of diet, take vitamin B₁₂ in supplements and fortified foods (e.g., fortified nondairy milks, fortified meat alternatives, and breakfast cereals). Vitamin B₁₂ is also contained in Red Star nutritional yeast, the only brand of nutritional yeast in Canada fortified with vitamin B₁₂. It has a similar flavour to cheese and can be sprinkled on top of casseroles and in soups. Vegan diets require a source of vitamin D when sun exposure is insufficient. Many fortified nondairy milks and breakfast cereals provide vitamin D, although the form used to fortify cereals is often not vegan (Dietitians of Canada, 2010). Good sources of vitamin D include fortified soy and other fortified non-dairy drinks and soft margarines. Vitamin D supplements may be used. There is no mention of vegetarian sources of omega-3 in Canada’s Food Guide. Omega-3 fats are found in oils (canola, flax seed, walnut and soybean); ground flax seed; and soybeans, tofu, and walnuts.

People over the age of 50 need additional calcium, vitamin D, and B₁₂. They should include three servings of fortified beverage each day to help meet calcium needs. It is also recommended that they take 400 IU of vitamin D each day from a supplement. They should get vitamin B12 from fortified foods or a supplement. A daily multivitamin-mineral supplement will help provide these extra vitamins and minerals (Dietitians of Canada, 2010).

Critical Thinking

Critical thinking requires the gathering and synthesizing of knowledge, experience, information from patients that is gained through intellectual and professional standards and attitudes of open-mindedness, respect for patient autonomy, and confidence. Clinical judgements involve the anticipation of the required information, analysis of the data, and openness to new ideas and multiple perspectives when making decisions regarding patient care. Critical thinking is thus a dynamic process. During assessment (Figure 42-4), all elements that contribute to the rendering of appropriate nursing diagnoses are considered.

When assessing nutrition, the nurse must integrate knowledge from nursing and other disciplines, previous experiences, information gathered from patients and families about food preferences, clinical observations, and dietary history. Professional standards, such as the DRIs and *Eating Well With Canada’s Food Guide* (Health Canada, 2007b), provide guidelines for

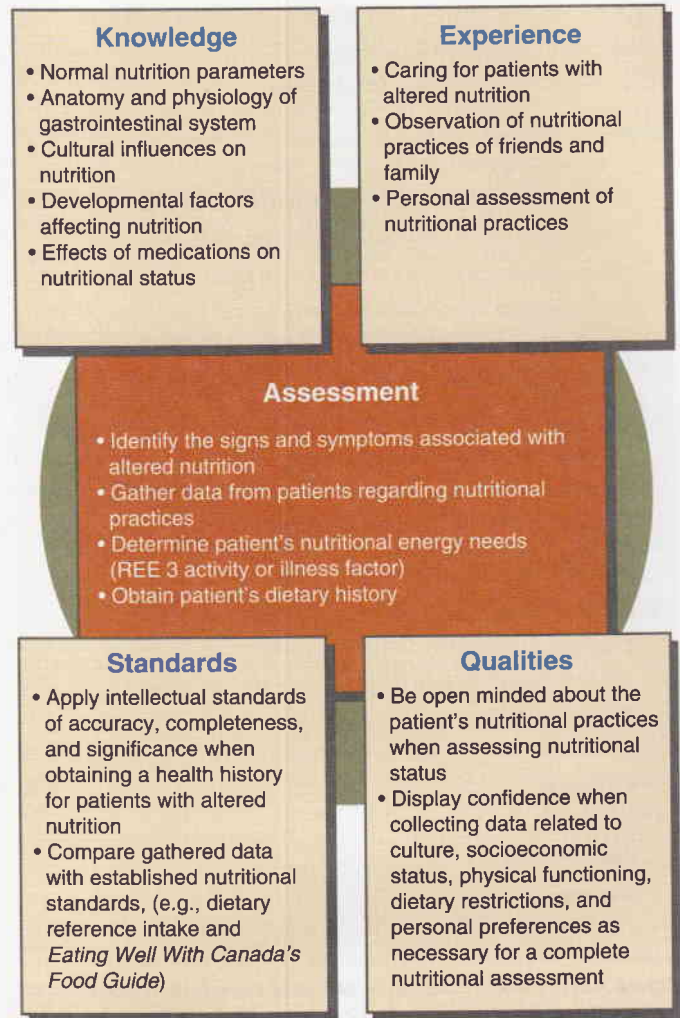


Figure 42-4 Critical thinking model for nutrition assessment.

assessing and maintaining patient nutritional status. Other professional standards from the Heart and Stroke Foundation of Canada, the Canadian Cancer Society, Canadian Society for Clinical Nutrition, and the Canadian Dietetic Association are available. These standards are research based and regularly updated to enhance optimal care.

Nursing Process and Nutrition

Nurses are in an excellent position to recognize signs of poor nutrition and take steps to initiate change. Close contact with patients and their families enables nurses to make observations about physical status, food intake, weight changes, and responses to therapy.

◆ Assessment

Early recognition of malnourished or at-risk patients has a strong, positive influence on both short- and long-term health outcomes. Studies have identified 20% to 50% of adult patients as being nutritionally at risk upon hospital admission and that such malnutrition increases hospital costs (Amarat et al., 2007; Kubrak & Jensen, 2007). Other studies have shown a relationship between malnutrition and adverse outcomes, including

Sample Items from SCREEN (Please choose only 1 response)

1. Weight Change

In the past 6 months . . .

- I have *gained* a lot of weight (more than 5 kg or 11 lbs). _____ 0
- I have *gained* quite a bit of weight (3–5 kg or 6–10 lbs). _____ 1
- I have *gained* some weight (1–2 kg or 2–5 lbs). _____ 2
- I have *gained* a little weight (less than 1 kg or 2 lbs). _____ 3
- My weight has not changed. _____ 4
- I have *lost* a little weight (less than 1 kg or 2 lbs). _____ 3
- I have *lost* some weight (1–2 kg or 5 lbs). _____ 2
- I have *lost* quite a bit of weight (3–5 kg or 6–10 lbs). _____ 1
- I have *lost* a lot of weight (more than 5 kg or 11 lbs). _____ 0
- I don't know if I have lost or gained weight. _____ 0

Item 1 Score _____

2. Fruits and Vegetables

Each day, I usually eat fruits or vegetables . . .
(canned, fresh, frozen, or juice)

- five or more times. _____ 4
- four times. _____ 3
- three times. _____ 2
- two times. _____ 1
- less than two times. _____ 0

Item 2 Score _____

Figure 42-5 Sample items from SCREEN for nutrition screening of seniors. **Source:** From Keller, H. H., Hedley, M. R., & Brownlee, S. W. (2000). The development of seniors in the community: Risk evaluation for eating and nutrition (SCREEN). *Canadian Journal of Dietetic Practice and Research*, 61(2), 72. SCREEN©. Seniors in the Community: Risk Evaluation for Eating and Nutrition. *Note:* This is only a sample from the tool and cannot be used on its own.

mortality (Stratton & Elia, 2006; Stratton et al., 2006). Moreover, the prevalence of malnutrition among special patient populations (e.g., oncology patients) may range as high as 90% (Kubrak & Jensen, 2007) and is associated with the interrelations between disease severity, disability, treatment, and self-care practices. Clearly, accurate assessment and recording of nutritional status is necessary to help patients make significant differences in their health and quality of life.

Nutritional screening is part of an initial assessment that involves identification of patients who are either malnourished or at risk of malnourishment (Green & Watson, 2005). The SCREEN (Figure 42-5) is a nutrition-risk screening index that consists of 15 questions about weight change, food and fluid intake, and risk factors associated with food and fluid intake. Five responses to questions are possible, with item scores ranging from 0 to 4. Low scores (<50) indicate increased nutritional risk (Beath & Keller, 2007).

Nutritional assessment goes beyond nutritional screening and involves five major areas: anthropometry, laboratory tests, dietary and health history, clinical observation and physical examination, and patient expectations. Assess nutritional

status when a condition exists that interferes with the patient's ability to ingest, digest, or absorb adequate nutrition. No single area or measurement accurately determines nutritional status, and a patient's personal and social health context needs to be considered.

Anthropometry

Anthropometry is a measurement system of the size and makeup of the body. Height and weight are obtained for each patient admission to any health care setting. If height cannot be measured with the patient standing, position the patient lying flat in bed as straight as possible with arms folded on the chest, and measure the patient lengthwise. If possible, the patient should be weighed at the same time each day, on the same scale, and with the same apparel. Serial measures over time provide more useful information than one-time measurement. An **ideal body weight (IBW)** provides an estimate of what a person should weigh. Rapid weight gain usually reflects fluid shifts. Five hundred mL of fluid equals 0.45 kg. For example, for a patient with renal failure or heart failure, a weight increase of 0.9 kg is significant, as it may indicate that the patient has retained a litre of fluid. Recent weight changes should be documented.

Body mass index (BMI) measures weight corrected for height and serves as an alternative to traditional height-weight relationships.

Calculation of BMI is achieved by dividing the patient's weight in kilograms by height in metres squared: $\text{Weight (kg)} / \text{Height}^2 (\text{m}^2)$. The BMI nomogram is available on Health Canada's Web site at http://www.hc-sc.gc.ca/fn-an/nutrition/weights-poids/guide-ld-adult/bmi_chart_java-graph_imc_java-eng.php. A BMI measuring between 25 and 30 indicates overweight, and greater than 30 defines obesity (Health Canada, 2003a). The BMI is a valid measurement of weight in relation to health; however, it is not recommended for use as the sole measurement of body composition or level of fitness because it does not differentiate between excess fat and muscle or bone and does not consider age, gender, or ethnicity (Health Canada, 2003a; Scheier, 2004). Care must be taken when interpreting overweight and obesity results for Canadian child obesity, as cutoff points different from adult cutoffs are used (He & Beynon, 2006; Statistics Canada, 2010c).

Heart and Stroke Foundation research indicates that for most people, the **waist circumference (WC)** measurement may be used to determine health risk. Overweight people who carry excess pounds around the waist are at greater risk of heart disease and stroke than those who carry it on their hips, thighs, and buttocks. The WC is measured at the part of the trunk located midway between the lower costal margin (bottom of lower rib) and the iliac crest (top of pelvic bone) while the person is standing, with feet somewhat apart. The person doing the measuring should stand beside the individual and fit the tape snugly, without compressing any underlying soft tissues. The circumference should be measured to the nearest 0.5 cm, at the end of a normal expiration. In men, a WC of 102 cm (40 inches) or greater places them at significant increased risk for heart disease and stroke. In women, this measurement is 88 cm (35 inches) or more (Health Canada, 2003a; Heart and Stroke Foundation, 2008).

Laboratory and Biochemical Tests

No single laboratory or biochemical test can be used to diagnose malnutrition. Factors that may alter test results include

fluid balance, liver function, kidney function, and the presence of disease. Common laboratory tests used to study nutritional status include measures of plasma proteins such as albumin, transferrin, prealbumin, retinol-binding protein, total iron-binding capacity, and hemoglobin. After feeding, the response time for changes in these proteins ranges from hours to weeks. The metabolic half-life of albumin is 21 days; transferrin, 7 days; prealbumin, 2 days; and retinol-binding protein, 12 hours. This range demonstrates why albumin level, for example, is not an accurate short-term indicator of serum protein status (Corbett, 2008). Serum albumin levels are affected by hydration; hemorrhage; renal or hepatic disease; acquired immune deficiency syndrome (AIDS); high-output drainage of wounds, drains, burns, or the gut; steroid administration; albumin infusions; age; pregnancy; and trauma, burns, stress, or surgery. Albumin level is a better indicator of chronic illnesses, whereas prealbumin level is a preferred indicator of acute conditions.

Nitrogen balance is important to establish serum protein status (see “Proteins” section). Nitrogen intake is calculated by dividing 6.25 into the total grams of protein ingested in a 24-hour period (Schlenker & Long, 2011). The output of nitrogen is established through laboratory analysis of a 24-hour urinary urea nitrogen level.

For patients with diarrhea or fistula drainage, a further addition of 2 to 4 g of nitrogen output is estimated. Nitrogen balance is found by subtracting the nitrogen output from the nitrogen intake. A positive (more nitrogen taken in than put out) 2 to 3 g nitrogen balance is ideal for anabolism. In contrast, negative (more nitrogen put out than taken in) nitrogen balance is present when catabolic states exist, such as in starvation or physiological stress.

Dietary History and Health History

Gather information about the patient’s illness or activity level to determine energy needs and compare that information with

food intake. Nursing assessment of nutrition also includes health status; age; cultural background (see Box 42-4); religious food patterns (see Table 42-4); socioeconomic status; personal food preferences; psychological factors; use of alcohol or illegal drugs; use of vitamin, mineral, or herbal supplements and prescription or over-the-counter drugs; and the patient’s general nutrition knowledge. Polypharmacy, multiple concurrent medication use, is a significant predictor of nutritional status in older adults and requires careful assessment (Chen et al., 2007).

In addition to the general nursing health history, a diet history is needed to assess the patient’s needs (Table 42-5). The dietary history focuses on the patient’s habitual intake of foods and liquids, as well as information about preferences, ability to obtain food, and allergies. Eliciting the diet and health history requires careful and respectful exploration of the patient’s perceived health status to identify any hidden areas of concern such as contained in the story (Box 42-5) of one nurse’s personal experience with celiac disease, a condition that damages the villi found within the lining of the small intestine, preventing absorption of nutrients important for staying healthy. The damage is due to a reaction to eating gluten, which is found in wheat, barley, rye, and possibly oats (Green & Cellier, 2007; Smith & Goodfellow, 2011).

Outpatient patients may keep a three- to seven-day food diary, which will enable more accurate calculation of nutritional intake and comparison to *Eating Well With Canada’s Food Guide* and DRIs to see if dietary habits are adequate. Culturally sensitive food-frequency questionnaires may also be used to establish patterns over time.

Clinical Observation and Physical Examination

Clinical observation is key to nutritional assessment. Because improper nutrition affects all body systems, observe the patient for signs of nutritional alterations during physical assessment (see Chapter 31). When the general physical assessment of the

BOX 42-5 NURSING STORY

A Life Changed*

Celiac disease (celiac) always seemed like a pretty straightforward disease to me: people with it who eat gluten have vomiting, diarrhea, and weight loss. As far as I was concerned, I knew the signs and symptoms of celiac, and I have three cousins who have it. What I didn’t know were the other, less obvious symptoms of celiac—ones that I had.

I was about to turn 30 when I went for routine allergy testing. I had stopped taking antihistamines four years earlier during pregnancy and wanted to see if I had “outgrown” my environmental allergies. The nurse interviewed me before the testing to ensure that she would test for the right allergens. When she asked me if I had any food allergies, my response was to laugh out loud. As an overweight woman, I explained that the only thing I wasn’t allergic to was food. The nurse invited me to share my medical history or any health issues I was having. She listened as I explained my past experience of postpartum depression and iron-deficiency anemia and my current difficulty getting pregnant again, frequent heartburn, and irritable bowel syndrome. When asked about my family history, I mentioned my cousins with celiac but added I didn’t have that. The nurse said she would test me for wheat allergy, just to make sure. I didn’t know it at the time, but because of

her experience as a nurse working at an allergy clinical, she identified symptoms commonly experienced by those with celiac—symptoms that even though I was a nurse myself I didn’t know to look for because I had not taken care of patients with celiac. I was shocked that day to find out that I had a wheat allergy. The follow-up blood testing ordered by the physician as well as the subsequent upper endoscopy performed to sample a piece of tissue (biopsy) from the first part of the small intestine (duodenum) confirmed the diagnosis. My life hasn’t been the same since. It’s been better!

Although transitioning to eating a gluten-free diet has been challenging, it’s been worth it. I learned to read food and medication labels carefully to look for hidden sources of grains and ingredients related to them. Because wheat and barley grains are common in the Canadian diet, sticking with this diet is difficult. I also got help from a registered dietitian who specialized in celiac disease and the gluten-free diet.

The nurse caring for me that day changed my life. In the brief time that we spent together, she was able to identify the one thing that was affecting my life in every way. By listening to my story and using her nursing expertise to connect her knowledge and experiences with mine, she was able to help me live a whole life. For that I will forever be grateful.

*By Daphne Kennedy, BN, RN, MN student.

► **TABLE 42-5** Obtaining a Dietary History (Acronym: FASTCHECK)

Components of a Dietary History	Areas to Assess and Questions to Ask
Food Practices	
Number, type, and location of meals eaten per day	How many meals do you eat? At what times do you usually eat? Are these scheduled meals or snacks? Where do you usually eat meals and snacks? With whom?
Food preferences	What types of food do you like?
Food-preparation practices	Who prepares the food?
Food-purchasing practices	Who purchases the food?
Allergies	Are you allergic to any foods? Specify these foods. What happens when you eat these foods? Specify the type of allergic response (e.g., hives, itching, anaphylaxis). What is done to treat allergies (e.g., EpiPen, oral antihistamines)?
Symptoms	
Indigestion, heartburn, gas, alterations in taste	What foods cause indigestion, gas, or heartburn? Does this occur each time you eat the food? Have you noticed any changes in taste? Did these changes occur with medications or following an illness?
Relief practices	What relieves the symptoms?
Twenty-Four Hour Recall	
To conduct the 24-hour diet recall (Wiehl, 1942), ask the patient to describe every item of food and drink ingested in a 24-hour period. The easiest time period to recall is from the time one awakens to the time one goes to bed again.	
a. Using open-ended questions and systematic repetition, ask, "When you first woke up yesterday, what was the first thing you put in your mouth?" "How much of it did you have?" "What time was that?" "What did you eat or drink next?" Do not ask about specific meals. Do ask for foods and drinks between any meals and at bedtime.	
b. Ask for specific types of foods and drinks: for example, "What kind of milk—whole, fat-free?" What kind of rice—brown, white?"	
c. Record time and amounts of all food eaten.	
d. Find out about methods of preparation (e.g., salt, fat) and ingredients in mixed dishes.	
e. Record intake of drinks to assess the adequacy of fluid intake.	
f. Determine if this intake is typical of most days.	
g. Record type and amount of alcoholic beverages and nonfood items consumed. Document servings consumed under "Other foods and beverages."	
After all the information for the diet history is collected, evaluate the 24-hour recall by	
a. Counting and recording the number of servings eaten for each food group	
b. Compare servings eaten to recommended daily servings appropriate for the age and sex of the patient	
Be aware that an individual may have difficulty estimating portion sizes and remembering everything, that 24 hours may not be representative of diet, and that the individual may feel pressure to say what is perceived as desired.	
Chewing and Swallowing	Do you wear dentures? Full or partial? Orthodontic devices? Are the dentures or devices comfortable? Assess the condition of the patient's teeth. Do you experience mouth pain or sores (e.g., cold sores, canker sores)? Do you have difficulty swallowing? Do you cough or gag when you swallow?
Hunger	
Appetite	Have you had a change in appetite? Have you noticed a change in weight?
Satiety	Was this change an anticipated change (e.g., were you following a weight-reduction diet)? Do you stop eating when feeling full? Do you pick at food between meals or eat substantially before bedtime?
Elimination Patterns	How often do you have bowel movements? Do you experience diarrhea with meals or specific foods? If yes, how do you manage the diarrhea? Do you experience constipation? If yes, how do you manage it?
Chemical Substances	
Medication use	What medications do you take?
Over-the-counter substances	Do you take any over-the-counter medications that your doctor does not prescribe? If yes, specify them.
Supplements	Describe any nutritional or herbal supplements you use.
Knowledge	Do you believe your current diet is adequate for meeting your energy needs? If not, what would you like to change?

► TABLE 42-6 Clinical Signs of Nutritional Status

Body Area	Signs of Good Nutrition	Signs of Poor Nutrition
General appearance	Alert; responsive	Listless, apathetic, cachectic appearance
Weight	Weight appropriate for height, age, body build	Obese or underweight appearance (special concern for underweight)
Posture	Erect posture; straight arms and legs	Sagging shoulders; sunken chest; humped back
Muscles	Well-developed, firm muscles; good tone; some fat under skin	Flaccid appearance, poor tone, underdeveloped tone; tenderness; edema; wasted appearance; inability to walk properly
Nervous system control	Good attention span; lack of irritability or restlessness; normal reflexes; psychological stability	Inattention; irritability; confusion; burning and tingling of hands and feet (paresthesia); loss of position and vibratory sense; weakness and tenderness of muscles (may result in inability to walk); decrease or loss of ankle and knee reflexes; absent vibratory sense
Gastrointestinal function	Good appetite and digestion; normal regular elimination; no palpable organs or masses	Anorexia; indigestion; constipation or diarrhea; liver or spleen enlargement
Cardiovascular function	Normal heart rate and rhythm; lack of murmurs; normal blood pressure for age	Rapid heart rate (above 100 beats/minute), enlarged heart; abnormal rhythm; elevated blood pressure
General vitality	Endurance; energy; good sleep habits; vigorous appearance	Easily fatigued; lack of energy; falling asleep easily; tired and apathetic appearance
Hair	Shiny, lustrous appearance; firmness; strands not easily plucked; healthy scalp	Stringy, dull, brittle, dry, thin, and sparse, depigmented appearance; strands that can be easily plucked
Skin (general)	Smooth and slightly moist skin with good colour	Rough, dry, scaly, pale, pigmented, irritated appearance; bruises; petechiae; subcutaneous fat loss
Face and neck	Uniform colour; smooth, pink, healthy appearance; lack of swelling	Greasy, discoloured, scaly, swollen appearance; dark skin over cheeks and under eyes; lumpiness or flakiness of skin around nose and mouth
Lips	Smoothness; good colour; moist (not chapped or swollen) appearance	Dry, scaly, swollen appearance; redness and swelling (cheilosis); angular lesions at corners of mouth; fissures or scars (stomatitis)
Mouth, oral membranes	Reddish pink, intact mucous membranes in oral cavity	Swollen, boggy oral mucous membranes
Gums	Pink; healthy appearance; lack of swelling or bleeding	Spongy gums that bleed easily; marginal redness, inflammation; receding gums
Tongue	Pink or deep reddish colour; lack of swelling; smoothness, presence of surface papillae; lack of lesions	Swelling, scarlet, and raw appearance; magenta colour, beefiness (glossitis); hyperemic and hypertrophic papillae; atrophic papillae
Teeth	Lack of cavities and pain; bright, straight appearance; lack of crowding; well-shaped jaw; clean appearance with no discolouration	Unfilled caries; absent teeth; worn surfaces; mottling (fluorosis); malpositioned appearance
Eyes	Bright, clear, shiny appearance; lack of sores at corner of membranes; eyelids moist and healthy pink colour; prominent blood vessels or lack of mound of tissue or sclera; lack of fatigue circles beneath eyes	Pale eye membranes (pale conjunctivae); redness of membrane (conjunctival infection); dryness; signs of infection; buildup of keratin debris in the conjunctiva (Bitot's spots), redness and fissuring of eyelid corners (angular palpebritis); dryness of eye membrane (conjunctival xerosis); dull appearance of cornea (corneal xerosis); soft cornea (keratomalacia)
Neck (glands)	Lack of enlargement	Thyroid enlargement
Nails	Firm, pink appearance	Spoon shape (koilonychia); brittleness; ridges
Legs, feet	Lack of tenderness, weakness, or swelling; good colour	Edema; tender calves; tingling; weakness
Skeleton	Lack of malformation	Bowlegs; knock knees; chest deformity at diaphragm; prominent scapulae and ribs

Source: Schlenker, E. D., & Long, S. (2007). *Williams' essentials of nutrition and diet therapy* (9th ed., p. 12). St Louis, MO: Mosby.

body systems is complete, pertinent areas can be rechecked to evaluate the patient's nutritional status. The clinical signs of nutritional status (Table 42-6) provide guidelines for observation during physical assessment.

Assess for aspiration (choking) risk and dysphagia (difficulty when swallowing). Those at risk of aspiration may have decreased levels of alertness, decreased gag or cough reflexes, difficulty managing saliva, or a wet, gurgling voice. The

warning signs of dysphagia include coughing during eating; change in voice tone or quality after swallowing; abnormal movements of the mouth, tongue, or lips; slow, weak, imprecise, inconsistent, or uncoordinated speech; abnormal gag reflex; delayed swallowing; incomplete oral clearance or pocketing of food or medications; and regurgitation. In Canada, approximately half of all new stroke patients older than 65 years of age live with dysphagia for months after the stroke.

Patients with dysphagia often do not show overt signs such as coughing when food enters the airway. “Silent aspiration” occurs in those with decreased sensation related to neurological problems (Garon et al., 2009; Ramsey et al., 2005) and accounts for most of the aspiration in patients with dysphagia following stroke (Westergreen, 2006). Early detection of dysphagia improves outcomes such as malnutrition, dehydration, pulmonary compromise, mortality, length of hospital stay, and overall health care expenditures (Heart and Stroke Foundation of Ontario, 2006).

The Canadian Stroke Network (2010, 2011) recommends early screening of all stroke patients, using a simple, valid, reliable formal dysphagia protocol before initiating oral intake of medications, fluids, or food in order to identify swallowing problems, help initiate referrals for more in-depth assessment, and significantly decrease risk of aspiration pneumonia. Nurses should implement aspiration precautions (Skill 42-1),

and refer patients at risk of malnutrition, including those with dysphagia, to a dietitian for nutrition assessment and ongoing management.

Patient Expectations

Because patients rely on nurses and other health care providers to identify problems, nurses must be knowledgeable about nutrition and nutritional screening, assessment, and referral to meet patient expectations and needs.

❖Nursing Diagnosis

Assessment enables determination of any actual or potential nutrition problems (Box 42-6). A problem may occur when overall intake is significantly decreased or increased, or when one or more nutrients are not ingested, completely digested, or completely absorbed. Specific diagnoses are related to the

► SKILL 42-1 Aspiration Precautions



Delegation Considerations

The assessment of aspiration risk and determination of positioning cannot be delegated to unregulated care providers (UCPs). However, UCPs may feed patients after receiving instructions about aspiration precautions. It is important to instruct UCPs about the following:

- Appropriate patient positioning to decrease aspiration risk
- Reporting of any onset of coughing, gagging, or pocketing of food

Procedure

STEPS

1. Give patients who are not alert within the first 24 hours post-stroke nothing by mouth (NPO) and monitor closely.
2. Assess patients at increased risk of aspiration for signs and symptoms of dysphagia (e.g., cough, change in voice after swallowing).
3. Ask patient about any difficulties with chewing or swallowing foods with different textures.
4. Ensure the clinical bedside screening trial is conducted by a speech language pathologist (SLP) or appropriately trained specialist.
5. Elevate head of patient's bed so that hips are flexed at a 90-degree angle and head is flexed slightly forward, or help patient to the same position in a chair.
6. The clinical bedside screening trial involves giving 5 to 10 mL of water, and if that is well tolerated, it is followed by a small cup (50 mL) of water.
7. For a patient who may feed self, explain that you are initially observing while the patient eats:
 - A. Observe patient consume various consistencies of food and liquids, watching for signs of dysphagia.
 - B. Note at the end of the meal if patient becomes tired.
 - C. Report signs and symptoms of dysphagia.
- D. Place identification on patient's record indicating that dysphagia is present.
8. For patients who require supervision or assistance with eating because dysphagia and risk of aspiration have been identified, explain that you will assist them with their meal:

Equipment

- Chair or electric bed (to allow patient to sit upright)
- Thickening agents as needed (commercial prethickened products or commercial thickening agent)
- Tongue blade
- Penlight

RATIONALE

- Risk of aspiration is high (Canadian Stroke Network, 2006)
- Patients at risk include those who have COPD or neurological or neuromuscular diseases and those who have had trauma to or surgical procedures of the oral cavity or throat.
- Certain types of food are more easily aspirated.
- The SLP is qualified to assess and to advise on the safety of the patient's swallowing ability and the consistency of diet and fluids.
- Reduces risk of aspiration (Metheny, 2004).
- Patients indicating dysphagia or pulmonary aspiration are to receive a full clinical assessment of their swallowing ability by a trained team member.
- Increases patient cooperation.
- Referral to a dietitian and SLP is appropriate if patient has difficulty with a particular consistency.
- Fatigue increases risk of aspiration.
- Signs or symptoms indicate the need for further evaluation of swallowing by SLP in collaboration with radiology department, such as a fluoroscopic swallow study (Garon et al., 2009). A significant number of individuals who aspirate do not exhibit signs and symptoms of dysphagia (Logeman et al., 2008).
- Alerts the health care team to the problem and helps the team to develop and implement an individualized plan of care (Nowlin, 2006).
- Increases patient comfort.

► SKILL 42-1 Aspiration Precautions—cont'd**video**

- A. Perform hand hygiene.
 - B. As ordered or recommended by the feeding/swallowing team, add thickener to thin liquids to create the consistency of nectar, honey, or pudding.
 - C. Place 1/2 (2.5 g) to 1 teaspoon (5 g) of food on unaffected side of the mouth, allowing utensil to touch the mouth or tongue.
 - D. Place hand on throat to gently palpate swallowing event as it occurs. Swallowing twice is often necessary to clear the pharynx.
 - E. Provide verbal coaching and positive reinforcement while feeding patient.
 - Feel the food in your mouth.
 - Chew and taste the food.
 - Raise your tongue to the roof of your mouth.
 - Think about swallowing.
 - Close your mouth and swallow.
 - Swallow again.
 - Cough to clear airway.
 - F. Observe for coughing, choking, gagging, and drooling of food; suction airway as necessary.
 - G. Provide rest periods as necessary during meal to avoid rushed or forced feeding.
 - H. Using a penlight and tongue blade, gently inspect patient's oral cavity during and after the meal to detect pockets of food.
 - I. Ask patient to remain sitting upright for at least 30 minutes after the meal.
 - J. Help patient to perform hand hygiene and mouth care.
 - K. Record intake and report any observations indicative of feeding and swallowing difficulties.
 - L. Ensure return of patient's tray to appropriate place, and perform hand hygiene.
 - 9. Weigh patient weekly at the same time on the same scale.
- Reduces transmission of microorganisms.
 - Thin liquids such as water and fruit juice are difficult to control in the mouth and are more easily aspirated (Canadian Stroke Network, 2010). It is essential to follow the team's determination for consistency because best practices have not as yet been established and individual clinicians may lack training (Campbell-Taylor, 2008). In one Canadian study, dementia and Parkinson's disease patients aspirated less often with honey-thickened liquids than with nectar-thickened liquids and chin-down posture (Logemann et al., 2008). Future investigation is needed to determine whether chin-down posture combined with honey or nectar-thickened liquid better prevents aspiration than either intervention independently (Robbins et al., 2008).
 - Provides patient with tactile cues to begin eating.
 - Helps evaluate swallowing effort.
 - Verbal cueing keeps patient focused on swallowing. Positive reinforcement enhances patient's confidence in ability to swallow.
 - These are indications that suggest dysphagia and risk for aspiration.
 - Avoiding fatigue decreases the risk of aspiration.
 - Pockets of food in the mouth often indicate difficulty swallowing.
 - Reduces the risk of gastroesophageal reflux, which causes aspiration (Nowlin, 2006).
 - Mouth care after meals helps prevent dental caries and reduce colonization of bacteria to reduce the risk of pneumonia (Nowlin, 2006).
 - Reduces spread of microorganisms.
 - Determines if weight is stable and reflects adequate caloric level.

Unexpected Outcomes*Coughs, gags, food "stuck in throat," or left in mouth**Avoidance of certain textures of food
Weight loss***Related Interventions**

- Patient may require a swallowing evaluation.
- Initiate consultation with an SLP for swallowing exercises and techniques to improve swallowing and reduce risk of aspiration.
- Notify the nurse in charge, health care provider, and SLP of any symptoms that occurred during meal and which foods caused the symptoms.
- Change consistency and texture of food.
- Discuss findings with the nurse in charge, health care provider, SLP, or registered dietitian.

Recording and Reporting

- Document the following in the patient's chart: patient's tolerance of various food textures, amount of assistance required, position during meal, absence or presence of any symptoms of dysphagia, and amount eaten.
- Report any coughing, gagging, choking, or swallowing difficulties to the nurse in charge or the health care provider.

► BOX 42-6 NURSING DIAGNOSTIC PROCESS

Imbalanced Nutrition: More Than Body Requirements

Assessment Activities

Obtain height and weight

Data and Defining Characteristics

52-year-old man
Height: 180 cm
Weight: 122 kg
Body mass index (BMI) = 37.7

Obtain 24-hour food history

Lack of satiety
High fat and carbohydrate intake, three meals plus a large evening snack/day, three to four beers per day

Fluid

Fluid intake is cola, beer, and juice, all high caloric and lacking nutrient density

Physical assessment

Short of breath on walking
Large abdomen
Blood pressure: 158/88 mm Hg
Pulse: 102 beats/minute
Respirations: 32 breaths/minute

Laboratory values

Cholesterol and triglycerides elevated.
All others within normal limits.

Medication

None

Social

Eats out with family two or three times a week.

actual nutritional problem (e.g., inadequate intake) but may also involve problems that place the patient at risk for nutritional deficiencies, such as oral trauma.

The nursing diagnostic statement is based on defining characteristics present in the assessment database. The suspected health problem related to the nursing diagnosis is stated. The following are examples of nursing diagnoses of patients with nutritional problems:

- *Risk for aspiration*
- *Constipation*
- *Diarrhea*
- *Deficient fluid volumes*
- *Excess fluid volume*
- *Health maintenance, ineffective*
- *Health-seeking behaviours (nutrition)*
- *Knowledge deficit (nutrition)*
- *Ineffective management of therapeutic regimen, individuals*
- *Imbalanced nutrition: less than body requirements*
- *Imbalanced nutrition: more than body requirements*
- *Risk for imbalanced nutrition: more than body requirements*
- *Feeding self-care deficit*

❖ Planning

The planning for enhanced, optimal nutritional status requires a higher level of care than simply correcting problems. Information from multiple sources must be synthesized to devise an individualized approach to care that is relevant to the

Knowledge

- Role of dietitians and nutritionists in caring for patients with altered nutrition
- Impact of community support groups and resources in assisting patients to manage nutrition
- Impact of bad diets on patients' nutritional status

Experience

- Previous patient responses to nursing interventions for altered nutrition
- Personal experiences with dietary change strategies (what worked and what did not)

Planning

- Select nursing interventions to promote optimal nutrition
- Select nursing interventions consistent with therapeutic diets
- Consult with other health care providers (e.g., dietitians, nutritionists, physicians, pharmacists, physiotherapists, and occupational therapists) to adopt interventions that reflect the patient's needs
- Involve family when designing interventions

Standards

- Individualize therapy according to patient needs
- Select therapies consistent with established standards of normal nutrition
- Select therapies consistent with established standards for therapeutic diets

Qualities

- Display confidence when selecting interventions
- Creatively adapt interventions for the patient's physical limitations, culture, personal preferences, budget, and home care needs

Figure 42-6 Critical thinking model for nutrition planning.

patient's needs (Figure 42-6). Consider all data sources when developing a nursing care plan (Box 42-7). It is crucial to refer to published standards that are based on scientific findings.

In clinical situations, patients have multiple related problems. The concept map in Figure 42-7 shows the relationship of nursing diagnoses in a patient with myasthenia gravis.

Goals and Outcomes

Goals and outcomes and priorities of care reflect the patient's physiological, therapeutic, and individualized needs. Mutually planned goals negotiated between the patient, nurse, and dietitian help ensure success. An overall goal for an obese patient might be "to achieve appropriate BMI height-weight range or be within 10% of ideal body weight." To accomplish this, establish regular obtainable goals of moderate weight loss rather than one large overwhelming goal (Costain & Croker, 2005). These smaller goals or outcomes can help the patient achieve the goal:

- Daily nutritional intake meets the minimal DRIs
- Daily nutritional fat intake is less than 30%
- Sugared beverages are removed from diet
- Patient refrains from eating between meals and after dinner
- Patient loses 0.5 to 1 kg per week

► BOX 42-7 NURSING CARE PLAN

Imbalanced Nutrition: Less Than Body Requirements

Assessment

Belinda Wong, a nurse practitioner in a community health centre, is seeing 68-year-old Mrs. Cooper, who has a history of heart failure. Recently, Mrs. Cooper noticed a weight loss (15%). She has been taking an antidepressant (sertraline) for three months for an initial episode of depression related to the loss of her husband six months ago. Mrs. Cooper was referred for counselling three months ago for help with grief and depression. When Belinda inquired about Mrs. Cooper's financial situation, Mrs. Cooper responded that it was difficult living on an income from the Canada Pension Plan but she was able to manage.

Assessment Activities

Ask Mrs. Cooper about her food intake during the last two days.

Assess Mrs. Cooper's knowledge base by asking her what she sees as strengths of her diet, about areas in which her diet is ineffective, and what resources she uses in guiding her meal planning.

Assess her use of medication.

Ask Mrs. Cooper about social interaction.

Weigh Mrs. Cooper and assess her posture.

Observe Mrs. Cooper for signs of poor nutrition.

Palpate her muscles and extremities.

Data and Defining Characteristics

She says she drinks one glass of juice in the morning and two or three cups of coffee. She may eat a sandwich in the late afternoon. "I'm just not interested in food. It has no taste."

She says she does not need to worry about being overweight and believes her diet is adequate for her needs, as she does not feel hungry. She says she thinks she should be eating more vegetables and drinking more milk. Her meal preparation is "quick and easy," which pleases her. She says she is "too tired to fuss over food."

She takes the following prescribed medications as instructed on a daily basis: sertraline, digoxin (cardiac glycoside), chlorothiazide (diuretic), and captopril (antihypertensive).

Mrs. Cooper says she is lonely and does not get out much, although her psychologist recommended more socializing. Her friends at church call to ask her to come to meetings, but she is not ready. She says she tires easily.

This weight loss occurred over six months, down 11 kg. She has stooped posture. She has a low BMI of 17.

Dull, thinning hair
Dry, scaling skin
Pale conjunctivae and mucous membranes

2+ bilateral pitting ankle edema
Generalized poor muscle tone

Nursing Diagnosis: *Imbalanced nutrition: less than body requirements* related to a decreased ability to ingest food as a result of depression and loss of appetite associated with antidepressant use.

Planning

Goals (Nursing Outcomes Classification)*

Mrs. Cooper will progressively gain weight.

Mrs. Cooper will consume adequate nourishment each day.

Mrs. Cooper will exhibit no signs of malnutrition.

Expected Outcomes

Weight Control

Patient will gain 0.5 to 1 kg/month until goal of 59 kg is reached.

Nutritional Status: Nutrient Intake

Patient will ingest 1900 kcal/day, including 50 g of protein per day.

Physical assessment and laboratory values will be within normal limits.

*Outcome classification labels are adapted from Wilkinson, J. M., & Ahern, N. R. (2009). *Nursing diagnosis handbook* (9th ed.). Upper Saddle River, NJ: Pearson Prentice Hall.

Continued

► BOX 42-7 NURSING CARE PLAN—cont'd

Interventions (Nursing Interventions Classification)[†]

Nutritional Counselling

Coordinate a plan of care with Mrs. Cooper, her family doctor, therapist, and dietitian.

Rationale

Successful nutrition care planning involves an interdisciplinary approach (Brauer et al., 2006).

Individualize menu plans.

Encourages intake by incorporating food preferences (Paquet et al., 2003).

Teach Mrs. Cooper about the value associated with consulting *Eating Well with Canada's Food Guide*.

Health Canada (2007b) recommendations for food selections provide optimal nutrition.

Nutritional Monitoring

Monitor Mrs. Cooper monthly for weight gain, anemia, serum albumin level, and total lymphocyte count (TLC).

Weight gain should be slow and progressive. Serum albumin of 40 g/L and TLC of 1500/mm³ are within normal limits (Corbett, 2008).

Perform physical assessment of hair, eyes, mouth, skin, and muscle tone.

To monitor for improved nutritional status.

Nutritional Management

Encourage Mrs. Cooper to eat small meals and increase dietary intake to help offset anorexia secondary to use of sertraline.

Sertraline is a selective serotonin reuptake inhibitor (SSRI) medication; diminished taste and anorexia are common effects of SSRIs. Frequent small meals help to reduce anorexia-associated weight loss.

Encourage fluid intake early in the day.

Older adults need eight 250 mL glasses per day of fluid from beverage and food sources. Concentrating intake in the morning and early afternoon prevents nocturia (Meiner & Lueckenotte, 2006).

Encourage fibre intake.

Fibre helps prevent constipation.

Encourage Mrs. Cooper to have congregate meals (lunch at senior centre) five times per week.

Eating with others encourages good nutrition and promotes socialization with peers. Encouragement from health providers and from family and friends is helpful for women of ages 55 to 74 who do not exercise and eat nutritiously (Tannenbaum & Shatenstein, 2007).

[†]Intervention classification labels adapted from Bulechek, G. M., Butcher, H. K., & Dochterman, J. M. (Eds.). (2008). *Nursing interventions classification (NIC)* (5th ed.). St Louis, MO: Mosby.

Evaluation

Nursing Actions

Ask Mrs. Cooper to keep a food diary for three days.

Patient Response and Finding

Her diary reflects that she ate her main meal at the senior centre at noon, had fruit and grain products for breakfast, and had a sandwich with fruit and milk in the evening.

Achievement of Outcome

Mrs. Cooper is selecting more nutritionally rich foods, consistent with current guidelines.

Observe Mrs. Cooper's appearance.

Her skin is less pale, hair appears to be in better condition and styled. Ankle edema is present, but less than 1+.

Mrs. Cooper has improved physical parameters of nutrition; still needs follow-up.

Weigh Mrs. Cooper.

Weight gain of 2 kg in four weeks.

Weight gain is steady; she is still below ideal body weight.

Ask Mrs. Cooper about appetite and energy level.

Mrs. Cooper responds that on days when she eats at the senior centre, her appetite seems better and she "wants to do more things." She notes that weekends are very lonely.

Weekday support for nutritional status appears effective. Mrs. Cooper needs to increase activity status and nutritional intake during weekends.

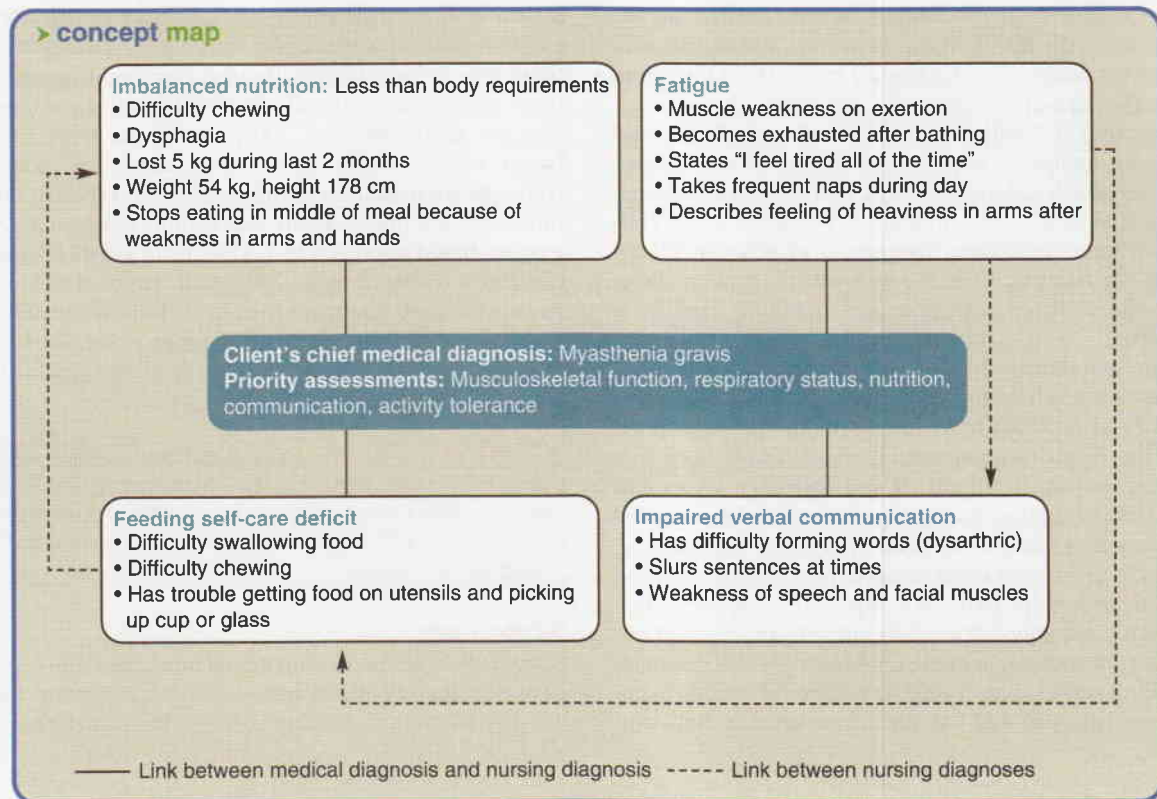


Figure 42-7 Concept map for patient with myasthenia gravis.

The setting of goals and outcomes requires interdisciplinary input. A satisfactory care plan requires accurate exchange of information between disciplines.

Setting Priorities

By identifying patients at risk for nutritional problems, health providers can help prevent or minimize those problems through timely interventions. Although changes in the patient's weight are often gradual, improving nutritional intake is a priority. With acute illness or surgery, food intake is often altered. The priority of care may be to provide optimal preoperative nutrition support for patients with malnutrition. Resumption of food intake postoperatively depends on the return of bowel function, the extent of the surgical procedure, and presence of complications (see Chapter 48).

Sometimes other priorities take precedence. For example, patients who have had throat surgery must be out of pain and comfortable before nutritional priorities can be addressed. Note also that it is important to collaborate with the patient and family when setting care priorities. Food purchase and preparation may involve the family, and the care plan may not succeed without their commitment, involvement, and understanding.

Continuity of Care

In any health care setting, continuity of care is essential, including continuity of nutritional interventions. Hospital discharge planning should extend nutritional interventions to the home or long-term care facility. In extended settings, the dietitian monitors the patient's nutritional status and intake and makes recommendations for changes.

When patients require long-term care or care at home, occupational therapists can help them to choose assistive devices, such as large-handled utensils and cups with a space for the nose. Food preparation areas can be rearranged to maximize the patient's function. Speech language pathologists (SLPs) recommend appropriate dietary textures and feeding strategies and assist patients with swallowing exercises and techniques to reduce aspiration risk.

Implementation

Health Promotion/Illness Prevention

Nurses are in a key position to educate patients about proper nutritional habits that may prevent the development of many diseases. Early identification of potential or actual problems is the best way to avoid more serious problems. Outpatient and community-based settings are key locations for nursing assessment of nutritional practices and status. Patients with nutritional problems such as obesity may require help with menu planning and adherence strategies. Frequently, nurses are in a position to educate families about nutrition, inform them of community resources, and provide contact information so that families can direct questions to a dietitian or other professional nurse.

Insufficient income is the most significant barrier to healthy eating (Raine, 2005). Food selection and quantity are positively associated with income. To illustrate, the degree to which adequate amounts of thiamine and vitamins A and C are consumed correlates with level of income (Ricciuto & Tarasuk, 2006). Higher fruit and vegetable intake among children has been associated with better education of parents and with

parental knowledge of health, both of which relate to income status (Riediger et al., 2007). At the same time, lower socioeconomic status is associated with physical inactivity in Canadian adolescents (Janseen et al., 2006).

Approximately 3.7 million (15%) Canadians rely on food banks that are unable to supply recommended amounts of fresh fruits, vegetables, dairy products, and meats and alternatives (Irwin et al., 2007). The problem is worsened when children cannot access nutritional programs at schools (Henry et al., 2003). In Atlantic Canada, low-income lone mothers and their older children have poor diet quality (Glanville & McIntyre, 2006).

Although mandatory fortification of staple foods with micronutrients has helped to reduce income-related disparities (Ricciuto & Tarasuk, 2006), other interventions are also needed to counter the threat to good nutrition and health from lack of purchasing power at individual and collective levels. For those on limited budgets, food preparation can be modified for substances that need to be used sparingly; for example, bean or cheese dishes can often replace meat. Menu planning a week in advance helps patients comply with a specific diet, eat nutritiously, and stay within their budget. A nurse or dietitian may check menus for content. Often, simple tips can help, such as baking rather than frying to reduce fat intake, using lemon juice or spices to add flavour to low-sodium diets, and

avoiding grocery shopping when hungry because it can lead to spontaneous purchases of foods not included in meal plans. Strategies to help financially disadvantaged groups improve their nutrition include collective kitchens and gardens (Engler-Stringer & Berenbaum, 2005), coalitions with community-based organizations, antipoverty advocacy, and political commitment to policies of full employment (Power, 2005). Also important are public-awareness forums (Chapman, 2006) and a rights-based approach to food security at federal and provincial levels (Rideout et al., 2007) with support to families that have inadequate resources to meet their daily nutritional needs (Kurtz Landy, 2007). See Box 42-8 for an example of an innovative program that aims to increase food security for individuals, families, and communities.

safety alert Food safety is also an important public health issue. Food-borne illnesses can occur from poor hygiene practices and improper food storage or preparation. Nurses should educate patients about reducing the risks of food-borne illnesses (Table 42-7 and Box 42-9).

Acute Care

Many factors influence nutritional intake in acute care settings. Ill or debilitated patients often have loss of appetite (**anorexia**). The ketosis that accompanies starvation can further suppress

* BOX 42-8 FOCUS ON PRIMARY HEALTH CARE

Case Study

Foodshare (Toronto) is a nonprofit community organization that promotes “good healthy food for all” while reducing costs to the health care system. Since 1985, Foodshare has worked with communities to improve nonstigmatizing access to affordable, nutritious, sustainably produced food through innovative programs, food markets, and policy recommendations. Food security is facilitated through the creation and distribution of resources, training workshops, networks, and coalitions. Food issues are addressed from the growing and processing of food to its distribution, purchasing, cooking, and consumption. The Foodshare programs try to rebuild food skills that are quickly being lost in Canadian society as people abandon the family meal tradition and turn increasingly to fast foods and eating on the run. Foodshare partners (e.g., the Government of Ontario, Public Health Services, community clinics and shelters, school boards, and the Volunteer Action Online program), professionals, teachers, parents, and volunteers work together to promote a locally sourced, grow-your-own-food lifestyle in various ways:

- **FoodLink Hotline:** Telephone referral 416-392-6655 available Monday to Friday 10 A.M. to 4 P.M. for those seeking information on food programs.
- **Community gardening programs:** Information, training (e.g., composting workshops), and resources provided to individuals and groups in preparing gardens and harvesting the produce.
- **Incubator Kitchen:** A fully equipped kitchen that provides groups without access to a commercial kitchen the opportunity to come together to plan and prepare low-cost nutritious meals in bulk.
- **The Good Food Box:** This food distribution system provides fresh fruit and vegetables at wholesale prices to over 200 community drop-off sites across the City of Toronto reaching 12,000 people. Individuals and families who are part of neighbourhood-based groups pay for and order food in advance. The program workers purchase foods in bulk to support local farmers; volunteers and

staff pack and deliver the food boxes to the drop-off sites. All boxes are accompanied by a newsletter offering nutrition information and economical food preparation tips. The “Reach for 5” basket, geared to seniors, contains prepared, cut-up fruit and vegetables.



- **Power Soups and Power Meals:** Foodshare makes dense soups, meals, and nutrition/training workshops available at a heavily subsidized price to Toronto shelters and drop-ins serving the homeless, which enables the underprivileged to have access to a wholesome meal.
- **Baby Nutrition:** Food-related activities for families with infants and preschoolers include workshops on making homemade baby food from fresh affordable food and cooking with kids.
- **Partners for Student Nutrition:** Foodshare works with Toronto Public Health and other community agencies to sponsor 300 student nutrition programs in Toronto.
- **Focus on Food:** A training program for marginalized youth focusing on community service and developing cooking, gardening, and nutrition skills.
- **Field to Table Wholesale Produce:** A community development project that makes fresh fruit and vegetables available and affordable to schools (e.g., the “Salad Bar” project) in order to promote increased consumption of fresh, nutritious foods among children.
- **Partnership with Canadian Mental Health Association:** Individuals living with mental health challenges earn minimum wage and gain valuable job skills producing sprouts and seedlings for sale.
- **Online food security resource centre:** An interactive library of electronic and print newsletters, food program manuals, community resource sites such as sustainable agriculture and anti-poverty issues with links to key Web sites, listservs, e-bulletins, and archived, current, and upcoming workshops.

► TABLE 42-7 Food Safety

Food-Borne Disease	Organism	Food Source	Symptoms*
Botulism	<i>Clostridium botulinum</i>	Improperly home-canned foods, smoked and salted fish, ham, sausage, shellfish	Symptoms vary from mild discomfort to death in 24 hours, initial nausea and dizziness progressing to motor (respiratory) paralysis
Escherichia coli	<i>Escherichia coli</i> 0157:H7	Undercooked meat (ground beef)	Severe cramps, nausea, vomiting, diarrhea (may be bloody), renal failure. Appears 1–8 days after eating, lasts 1–7 days
Listeriosis	<i>Listeria</i> species <i>L. monocytogenes</i>	Soft cheese, meat (hot dogs, pâté, lunch meats), unpasteurized milk, poultry, seafood	Severe diarrhea, fever, headache, pneumonia, meningitis, endocarditis, appears 3–21 days after infection
Perfringens enteritis	<i>Clostridium</i> species <i>C. perfringens</i>	Cooked meats, meat dishes held at room or warm temperature	Mild diarrhea, vomiting. Appears 8–24 hours after eating, lasts 1–2 days
Salmonellosis	<i>Salmonella</i> species <i>S. typhi</i> <i>S. paratyphi</i>	Milk, custards, egg dishes, salad dressing, sandwich fillings, polluted shellfish	Mild to severe diarrhea, cramps, vomiting. Appears 12–24 hours after ingestion, lasts 1–7 days
Shigellosis	<i>Shigella</i> species <i>S. dysenteriae</i>	Milk, milk products, seafood, salads	Mild diarrhea to fatal dysentery. Appears 7–36 hours after ingestion
Staphylococcus	<i>Staphylococcus</i> species <i>S. aureus</i>	Custards, cream fillings, processed meats, ham, cheese, ice cream, potato salad, sauces, casseroles	Severe abdominal cramps, pain, vomiting, diarrhea, perspiration, headache, fever, prostration. Appears 1–6 hours after ingestion, lasts 1–2 days

*Symptoms are generally more severe for youngest and oldest age groups.

Source: Nix, S. (2005). *Williams' basic nutrition and diet therapy* (12th ed.). St Louis, MO: Mosby.

* BOX 42-9 PATIENT TEACHING

Food Safety

Objectives

- Patient will verbalize measures to prevent food-borne illness.
- Patient will understand the primary types of illness and how they are transmitted.
- Patient will not experience food-borne illness.

Teaching Strategies

Populations particularly at risk are older and younger people and immunosuppressed individuals. Instruct patients on the following:

- Wash hands with warm, soapy water before touching or eating food.
- Cook meat, poultry, fish, and eggs until they are well done.
- Wash fresh fruits and vegetables thoroughly.
- Do not eat raw meats or drink unpasteurized milk.
- Do not buy or consume food that has passed the expiration date.
- Keep foods properly refrigerated at 4°C and frozen at -18°C.
- Wash dishes and cutting boards with hot, soapy water or use a bleach sanitizer using 5 mL bleach in 750 mL water.
- Refrigerate leftovers within two hours. Do not save for more than four days in the refrigerator.
- Wash dishcloths, towels, and sponges regularly, or use paper towels.
- Clean the inside of the refrigerator and microwave regularly to prevent microbial growth.

Evaluation

- Ask patient to describe measures to prevent food-borne illnesses.
- Observe the patient at home for safe practices, if making a home visit.

Source: Government of Canada. (2010). *Safe food handling and preparation*. Retrieved from <http://www.foodsafety.gc.ca/english/fssa/prepare.asp>.



appetite, as can the pain that results from surgical procedures and trauma. Mealtimes, during hospitalizations, are often interrupted or the patient is too fatigued or uncomfortable to eat. Worry about families, finances, employment, or illness often interferes with getting an adequate diet. Medications may impair taste, cause nausea, interfere with absorption, or affect metabolism. Diagnostic testing may disrupt mealtimes or require a nothing by mouth (NPO) status. Patients who are NPO and receive only standard IV fluids for more than seven days are at nutritional risk.

Nurses must continuously assess patient nutritional status and plan interventions that promote normal dietary intake, digestion, and metabolism of nutrients. Patients may have a gradual progression of dietary intake or need therapeutic diets to manage their illnesses (Box 42-10).

Promoting Appetite. In providing an environment that promotes a patient's appetite, it is important to eliminate unpleasant odors, provide oral hygiene as needed to remove disagreeable tastes, and maintain patient comfort. Certain medications can affect dietary and nutrient intake; for example, insulin, glucocorticoids, and thyroid hormones affect metabolism. Other medications, such as antifungal agents, can affect taste. Some psychotropic medications affect appetite, cause nausea, and alter taste. At times the nurse and dietitian can help the patient select foods to reduce the altered taste sensations or nausea. In other situations, medication may need to be changed. Physicians may order pharmacological agents to stimulate appetite (e.g., cyproheptadine [Periactin], megesterol [Megace]) or to manage symptoms that interfere with nutrition.

Assisting Patients With Feeding

Many conditions, including cancer, stroke, and neuromuscular disorders, can cause feeding difficulties. The task of feeding requires nursing knowledge and skilled intervention to protect patient safety, independence, and dignity.

► BOX 42-10

Diet Progression and Therapeutic Diets**Clear Liquid**

This diet is limited to broth, bouillon, coffee, tea, carbonated beverages, clear fruit juices, gelatin, or Popsicles.

Thickened Liquid

All liquids (e.g., juice, tea, coffee, water, etc.) must be thickened to the appropriate consistency (nectar, honey, or pudding) as recommended by the SLP/feeding team when thin fluids cannot be safely swallowed and may be aspirated.

Full Liquid

To a clear- or thickened-liquid diet can be added smooth-textured dairy products, custards, refined cooked cereals, vegetable juice, puréed vegetables, or any fruit juices.

Puréed

This diet includes all of the above with the addition of scrambled eggs, puréed meats, vegetables, fruits, or mashed potatoes and gravy.

Mechanical Soft

This diet includes all of the above with the addition of ground or finely diced meats, flaked fish, cottage cheese, cheese, rice, potatoes, pancakes, light breads, cooked vegetables, cooked or canned fruits, bananas, soups, or peanut butter.

Soft or Low Residue

Low-fibre, easily digested foods, such as pastas, casseroles, moist tender meats, canned cooked fruits and vegetables, desserts, cakes, and cookies without nuts or coconut, can be added.

High Fibre

This diet includes fresh uncooked fruits, steamed vegetables, bran, oatmeal, and dried fruits.

Low Sodium

A low-sodium diet is limited to 4 g (no added salt), 2 g, 1 g, or 500 mg sodium (severe sodium restriction), requiring selective food purchases.

Low Cholesterol

This diet is restricted to <200 mg/day cholesterol, in keeping with the National Cholesterol Education Program (NCEP) recommendations (Grundy et al., 2004).

Diabetic

In general, people with diabetes should follow a healthy diet recommended for the general population in *Eating Well With Canada's Food Guide* (CDA, 2008; Health Canada, 2007b). This includes consuming a variety of foods from the four food groups (grain products, vegetables and fruits, milk products, meat and alternatives), attaining and maintaining a healthy body weight, decreasing total fat intake to <30% of calories, and ensuring an adequate intake of carbohydrate, protein, essential fatty acids, vitamins, and minerals.

Regular

Dietary restrictions are not necessary unless specified.

Before Feeding. Assess the patient's risk of aspiration (see "Assessment" in this chapter and Skill 42-1). The patient should sit as upright as possible with head tilted slightly forward and may be supported by pillows, foam wedges, or rolled towels. Do not feed a patient who is lying back or has the neck arched or hyperextended because these positions

create an open airway susceptible to aspiration. Glasses, hearing aids, and dentures should be functioning and in place. Clothing and bedding should be protected with napkins, towels, or aprons, and these items should not be called "bibs." Ensure that suction apparatus at the bedside has been checked.

During Feeding. Keep the patient upright. Use a rocking motion of utensil on the patient's tongue. When the patient has hemiplegia (one-sided weakness), the head should be tilted slightly toward the stronger side to avoid pouching (Nursing Times, 2003). Place small bites of food on the stronger side of the patient's mouth. If indicated by the feeding/swallowing team, allow the patient to take a drink between each mouthful of food to ease the process of eating. The patient should be observed for pouching of food. A metal teaspoon is usually the best utensil to use for feeding patients with bite reflexes.

Assess swallowing during feeding and give patients with dysphagia enough time to chew. Allow at least 5 to 10 seconds or longer for each bite or sip. Observe for two completed swallows between mouthfuls. The patient's Adam's apple should move up and down. If the food is still present, offer an empty spoonful to stimulate swallowing.

The nurse who is helping the patient to eat should sit in the patient's line of vision and provide prompting, encouragement, and direction, both verbally and nonverbally, when appropriate. The nurse avoids hovering with the next spoonful of food as this may cause a patient to hurry and worsen any swallowing difficulties. Patience, attention, and time are essential. When possible, try to heed special requests, such as for the food to be warmed up. Promote comfort and a sense of independence by providing opportunities for patients to direct the order and speed at which they want to eat. Give the patient as much choice as possible; for instance, ask if the patient wants peas and potatoes together or separate on the spoon. The family can be asked about the patient's favourite foods. Because mealtime is usually a social activity, it is important that nurses and other health providers talk to patients during meals. Use this opportunity to educate patients about therapeutic diets, medications, or adaptive devices.

Patients with visual deficits also need special assistance. Position food within the patient's visual field. If the patient wears glasses or contact lenses, they should be clean and in place. Patients with poor vision may be able to feed themselves if adequate care and information is given. Identify the location of the food on the plate as if it were a clock (e.g., meat at 9 o'clock and vegetable at 3 o'clock). Tell the patient where the beverage is located in relation to the plate. Patients with decreased motor skills may retain more independence by using large-handled adaptive utensils, which are easier to grip and manipulate.

When food intake is less than usual because of illness or fatigue, nutrient-dense items should be provided first. Small frequent meals, five to six per day, may be required.

After Feeding. The patient should remain upright for 30 minutes after eating. Check again for pocketing of food. If the patient needs to lie down because of fatigue, raise the head of the bed to sitting-up level. Note and document intake. Identify if any particular food was eaten faster (e.g., a preference) or with difficulty (e.g., soft meat may need to be replaced with ground). Report and document any instances of choking and fatigue. After each meal, the patient should perform oral hygiene.

Restorative and Continuing Care

Patients discharged from a hospital with dietary prescriptions often need dietary education to plan meals that meet specific therapeutic requirements. Restorative care includes immediate postsurgical care and routine medical care and is pertinent to hospitalized and home care patients.

❖Evaluation

Care plans should reflect achievable goals and outcomes. You will need to evaluate outcomes of nursing actions and be alert for signs that goals are being met. Allow adequate time for testing each nursing approach to a problem.

Patient Care

The effectiveness of nutritional interventions is best measured by meeting the expected patient outcomes and goals of care (Figure 42-8). Nutrition therapy does not always produce rapid results. Ongoing comparisons may be made with baseline measures of weight, serum albumin or prealbumin, and protein and kilocalorie intake. Medications may produce unwanted side effects. If gradual weight gain is not observed, or if weight loss continues, the prescription may need to be

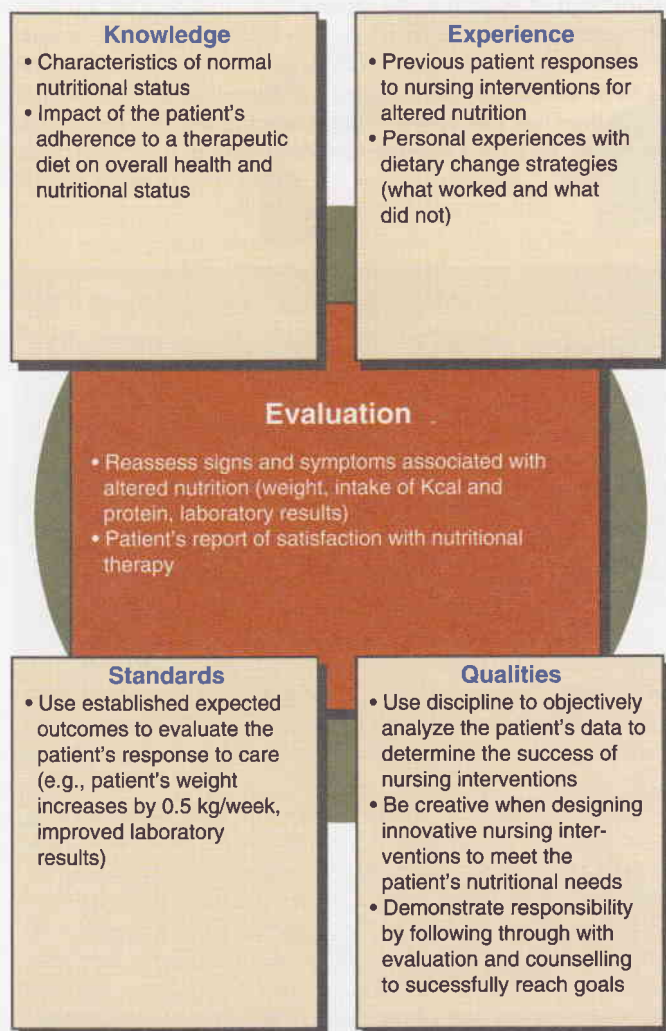


Figure 42-8 Critical thinking model for nutritional evaluation.

adjusted. Changes in health condition may indicate a need to change the nutritional care plan. Interdisciplinary members of the health team should be consulted, and the patient should be an active participant whenever possible. The patient's ability to incorporate dietary lifestyle changes with the least amount of stress or disruption will ensure success. When expected outcomes are not met, revise the interventions or outcomes on the basis of the patients' needs and preferences.

Patient Expectations

Patients expect competent and accurate care. They expect nurses to alter the care plan if outcomes of nutritional therapies are unsuccessful. Your expectations and health values may differ from those held by patients. By working closely with patients, you can get to know their expectations and try to meet them within the limits of their conditions and treatments.

Self-Monitoring of Blood Glucose

Self-monitoring of blood glucose (SMBG) is a cornerstone of diabetes management. By providing a real-time blood glucose reading, SMBG enables the patient to make self-management decisions regarding diet, exercise, and medication.

Portable blood glucose meters are used at the hospital bedside and by patients who perform SMBG independently. In Canada, the only continuous glucose monitoring system (CGMS) available is the Medtronic MiniMed Paradigm REAL-Time System. A sensor is inserted under the skin, and data are sent from the sensor to a transmitter, which displays the glucose value on an insulin pump continuously; values are updated every five minutes. This system assists the patient and health care provider to identify trends and track patterns; thus, it is particularly useful for managing insulin therapy, alerting the patient during episodes of hypoglycemia and hyperglycemia, and allowing prompt, immediate, and corrective action.

The blood glucose (BG) level reported by a laboratory is sometimes higher than the measurement by the patient's home glucose monitor or the hospital's portable meter. This is because some meters measure capillary blood glucose from whole blood (via finger stick), whereas laboratory venous samples yield plasma readings. Plasma samples, or venous samples, are <20% higher when the BG levels are >4.2mmol/L. Less variation is recommended when BG levels are less than or equal to 4.2mmol/L (CDA, 2008). Most meters are automatically calibrated to give a "plasma" test reading (although whole blood was used for the sample) so that home readings can be more readily compared with laboratory values.

Instructions for using a blood glucose meter (BGM) accompany each product. Because errors in monitoring technique can cause errors in management strategies, thorough patient education is crucial. Once initial education has occurred, follow-up educational sessions should take place at each subsequent patient contact and also be timed to coincide with regular appointments for reassessment. In addition, patients must be taught to calibrate their BGM and use control solutions. In Canada, the control solutions are not included in the BGM kits and are not stocked by most pharmacies. A person with diabetes must call the company to ask for the control solution, and it will be sent to them at no charge. The control solution has a very narrow expiry date and once opened lasts only three months. The person must run the control test every week.

The chief advantage of SMBG is that it supplies immediate information about blood glucose levels that can be used to make adjustments in food intake, activity patterns, and medication dosages. It also produces accurate records of daily glucose fluctuations and trends, as well as alerting the patient to acute episodes of hyperglycemia and hypoglycemia. Furthermore, it provides patients with a tool for achieving and maintaining specific glycemic goals. SMBG is recommended as an essential part of daily diabetes management for all people using insulin or oral hypoglycemic agents (OHAs). The frequency of monitoring depends on several factors, including the patient's glycemic goals, the type of diabetes that the patient has, the patient's ability and willingness to perform the test independently, and the treatment regimen. It is recommended that patients with type 1 diabetes test at least three times per day and include both preprandial and postprandial testing. Those using an insulin pump may test more frequently. People with type 2 diabetes treated with OHAs or through lifestyle changes alone have more variable and individualized testing regimens. For patients with type 2 diabetes treated with once-daily insulin and OHAs, monitoring at least once daily is recommended (CDA, 2008).

Blood glucose testing should also be performed whenever hypoglycemia is suspected so that immediate action can be taken if necessary. When the person with diabetes is ill, the blood glucose should be tested every two to four hours to determine the effects of this stressor on blood glucose level (CDA, 2008). (See Skill 42-2 for a description of how to monitor blood glucose.)

SMBG empowers the patient to be an active partner in the treatment of diabetes. Achieving the desired level of patient participation requires time and effort from the health

care provider. If a patient is visually or cognitively impaired or has limited manual dexterity, the degree to which SMBG can be performed independently must be evaluated carefully. Nurses working in home health and outpatient settings may need to identify caregivers who can assume this responsibility.

Enteral Tube Feeding

Enteral nutrition refers to nutrients given via the gastrointestinal tract. When the patient cannot ingest food but is still able to digest and absorb nutrients, enteral tube feeding is indicated. Feeding tubes can be inserted through the nose (or orally if necessary) into the stomach or intestines (nasogastric-oro gastric or nasointestinal-oro intestinal tubes), surgically through a stoma (a surgically created opening) into the stomach or jejunum (gastrostomy or jejunostomy tubes), or endoscopically (percutaneous endoscopic gastrostomy [PEG] or jejunostomy [PEJ] tubes). A registered nurse may insert nasogastric or orogastric tubes for abdominal decompression and for enteral feedings with an order from a physician (Best, 2007; Dugas & Knor, 1995). Large-bore sump tubing nasogastric tubes are most often used for both decompression and short-term enteral feeding, whereas small-bore, silastic tubing with insertion stylet is used for longer-term feeding needs (Bankhead et al., 2009). All other tubes must be inserted by a physician. In some settings (e.g., the ICU), a large tube is used to start the tube feed and if the patient tolerates it for the first 24 to 48 hours, a small-bore tube is then inserted. As well, if the patient has a small-bore tube placed in the duodenum, the physician may elect to leave the sump tube in the stomach for

Text continued on p. 1087

► SKILL 42-2 Blood Glucose Monitoring

When you cannot perform venipuncture to obtain capillary blood, skin puncture is an alternative method to reduce the frequency of needle sticks and for self-management of diabetes mellitus. The procedure is less painful than venipuncture, and patients can perform this procedure. The development of blood glucose testing strips, home glucose monitors, and the skin puncture method have revolutionized home management care for patients with diabetes mellitus.

There are two methods for self-testing of blood glucose level. Both methods require obtaining a large drop of blood by skin puncture. You can use a hand-held single-use lancet or an automatic lancet-holder device. You then apply the drop of blood on the specially prepared testing strip.

The first self-testing method involves visually reading the reagent strip by comparing it with the colour chart on the container. Examples of such strips are Chemstrip bG, Glucostix, and TrendStrips. If the colour on the strip appears between two reference blocks on the chart, you may need to estimate the results. Consequently, results of blood glucose measurement using this method may not always be accurate.

The second type of blood glucose monitoring entails the use of reflectance meters (Figure 42-9). A variety of meters are on the market, such as the Glucometer II (Ames), Accu-Chek III (Boehringer Mannheim), Glucoscan 3000 (LifeScan), and OneTouch (LifeScan). After a drop of blood from the skin puncture is placed on the testing strip, the meter provides an accurate measurement of blood glucose level in less than 60 seconds.

For these meters, a wet-wash or dry-wipe method of testing is used. To perform a wet wash, the user flushes the blood-coated

testing strip with water before inserting the strip into the glucose meter. The dry-wipe method requires the user to wipe off the blood-coated testing strip with a dry cotton ball before making a reading. Some products do not require blood to be flushed or wiped before a reading. The various methods allow measurement of blood glucose between 1.1 and 44.4 mmol/L, which is a sensitive measurement of blood glucose level.

These meters differ in several ways: the amount of blood needed for each test, testing speed, overall size, ability to store test results in memory, cost of the meter, and cost of test strips (Klonoff, 2010). Some larger meters are voice activated, which is helpful for older adult patients with visual impairments. Glucose readings may be from 0 to 44.4 mmol/L. The amount of time to complete the glucose testing with the current glucose meters varies from 5 seconds to 50 seconds. Some meters can be programmed to monitor glucose levels for a continuous 72 hours.

Most meters allow for alternative sites, such as the forearm, palm, and thigh. Two new methods of obtaining glucose measurement are available on the market. Minimally invasive glucose meters have a very small fine plastic sensor inserted through the abdomen, and they provide continuous readings of blood glucose levels. A bio-sensor is taped on the external abdomen (Figure 42-10). Using a hand-held wireless meter, the patient activates the biosensor to transmit the blood glucose level at any time without puncturing the skin. Another model, the noninvasive glucose meter, punctures the skin not with a needle but with laser technology.

SKILL 42-2 Blood Glucose Monitoring—cont'd

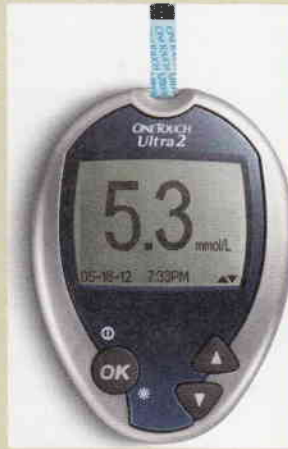


Figure 42-9 Blood glucose monitor. **Source:** Courtesy of LifeScan, Inc., Milpitas, CA.



Figure 42-10 A tiny sensor (A) implanted under skin transmits continuous reading to receiver (B), to alert wearer of any deviation from desired glucose target range. Readings are displayed and stored on the monitor (C). **Source:** Courtesy of DexCom, Inc.

Delegation Considerations

The task of measuring blood glucose level after skin puncture (capillary puncture) can be delegated to an unregulated care provider (UCP) who is specifically instructed in performing the skill. The nurse must first assess the patient to determine that it is appropriate to delegate blood glucose monitoring. If the patient's condition changes frequently, this task should not be delegated. The nurse directs the UCP by

- Explaining appropriate sites to use for puncture and when to obtain glucose levels
- Reviewing expected levels and when to report to the nurse unexpected glucose levels

Equipment

- Antiseptic swab
- Cotton ball or tissue
- Sterile lancet or blood-letting device
- Heel-warming device (*optional*)
- Paper towel
- Blood glucose meter (e.g., OneTouch)
- Blood glucose test strips (brand determined by meter used)
- Disposable gloves

Procedure

STEPS

1. Assess understanding of procedure and purpose. Determine whether patient with diabetes mellitus understands how to perform test and realizes importance of glucose monitoring.
2. Determine whether specific conditions need to be met before or after sample collection (e.g., with fasting, after meals, after certain medications, before insulin doses).
3. Determine whether risks exist for performing skin puncture (e.g., low platelet count, anticoagulant therapy, bleeding disorders).

RATIONALE

- Data set guidelines for nurse to develop teaching plan.
- Dietary intake of carbohydrates and ingestion of concentrated glucose preparations alter blood glucose levels.
- Abnormal clotting mechanisms increase risk for local ecchymosis and bleeding.

Continued

► SKILL 42-2 Blood Glucose Monitoring—cont'd

4. Assess area of skin that you will use as puncture site. Inspect the patient's fingers, toes, and heel. Alternative sites are the palm, arm, and thigh. Avoid areas that have bruises and open lesions.
 5. Review health care provider's order for times and frequency of measurement.
 6. If diabetic patient performs test at home, assess patient's ability to handle skin-puncturing device. If patient chooses, he or she may wish to continue self-testing while in hospital.
 7. Expected outcomes after completion of procedure:
 - Puncture site shows no evidence of bleeding or tissue damage.
 - Blood glucose level is normal.
 - Patient demonstrates procedure.
 - Patient explains test results.
 8. Explain procedure and purpose to patient or family, or both. Offer patient and family opportunity to practise testing procedures. Provide resources and teaching aids for patient.
 9. Perform hand hygiene before procedures.
 10. Instruct patient to perform hand hygiene with soap and warm water, if patient is able.
 11. Position patient comfortably in chair or in semi-Fowler's position in bed.
 12. Remove test strip from container, then tightly seal cap. Check the code on the test strip vial.
 13. Turn on glucose meter, if necessary.
- Sides of fingers, toes, and heels are commonly selected because they have fewer nerve endings.
 - Measurements at alternative sites are meter specific and may be different from measurements at traditional sites (Corbett, 2008). The puncture site should not be edematous, inflamed, or recently punctured because these factors cause increased interstitial fluid and blood to mix and also increase the risk for infection.
 - Health care provider determines test schedule on basis of patient's physiological status and risk for glucose imbalance.
 - Patient's physical health may change (e.g., vision disturbance, fatigue, pain, disease process), preventing patient from performing test.
 - Hemostasis achieved. Lancet or needle did not puncture skin too deeply.
 - Normal fasting glucose level is 4 to 6 mmol/L, indicating good metabolic control.
 - Patient demonstrates psychomotor learning.
 - Patient validates knowledge.
 - Such explanations promote understanding and cooperation.
 - Hand hygiene reduces transfer of microorganisms.
 - Instructions promote skin cleansing and vasodilation at selected puncture site. Hand washing establishes practice for patient when test is performed at home. Because of its ability to remove food residue from the hands and fingers, hand washing is superior to the use of alcohol pads to cleanse the test site.
 - This position ensures easy accessibility to puncture site. Patient will assume position when self-testing.
 - Sealing cap protects unused strips from accidental discolouration caused by exposure to air or light. Code on test strip vial must match code entered into the glucose meter.
 - Turning on activates meter.

Critical Decision Point: Some monitors are activated when the test strip is inserted and therefore do not have a specific on-off switch.

14. Insert strip into glucose meter (refer to manufacturer's directions), and make necessary adjustments (see Step 14 illustration).
- Some machines must be calibrated; others require zeroing of timer. Each meter is adjusted differently.



Step 14 Load test strip into meter. **Source:** Courtesy of Accu-Chek Glucometer.

15. Remove unused glucose test strip from meter and place on paper towel or clean, dry surface with test pad facing up (see manufacturer's directions).
 16. Apply disposable gloves.
 17. Choose puncture site. Puncture site should be vascular. In adults, select lateral side of finger; be sure to avoid central tip of finger, which has more dense nerve supply.
- Moisture on strip can alter accuracy of final test results.
 - Wearing gloves reduces risk for contamination by blood.
 - Vascularity ensures free flow of blood after puncture.

► SKILL 42-2 Blood Glucose Monitoring—cont'd

18. Hold the finger that you will puncture in dependent position while gently massaging finger toward puncture site.
 19. Clean site with antiseptic swab, and allow it to dry completely.
 20. Remove cover of lancet or blood-letting device. Hold lancet perpendicular to puncture site, and pierce finger or heel quickly in one continuous motion (do not force lancet).
 21. Some employers use lancet devices with an automatic blade retraction system. This reduces the possibility of self-sticks, preventing exposure to blood-borne pathogens. Place blood-letting device firmly against side of finger and push release button, causing needle to pierce skin (see Step 21 illustration).
 22. Wipe away first droplet of blood with cotton ball. (See manufacturer's directions for meter used.)
 23. Lightly squeeze puncture site (without touching) until a second large droplet of blood has formed (see Step 23 illustration). Repuncturing is necessary if large enough drop does not form to ensure accurate test results. (See manufacturer's direction regarding how blood is applied.)
- Massage increases blood flow to area before puncture.
 - The site must be allowed to dry because alcohol can cause blood to hemolyze.
 - Cover keeps tip of lancet or needle sterile.
 - Blood-letting devices are designed to pierce skin to specific depth, ensuring adequate blood flow. Perpendicular position ensures proper skin penetration.
 - First drop of blood may contain more serous fluid than blood cells.
 - Adequate-sized droplet is needed to activate monitor and obtain accurate results. Excessive squeezing of tissues during blood sample collection may contribute to pain, bruising, scarring, and hematoma formation (Pagana & Pagana, 2007).



Step 21 Prick side of patient's finger with lancet. **Source:** Courtesy of Accu-Chek Glucometer.



Step 23 Squeeze puncture site until a large droplet of blood is expressed.

Critical Decision Point: Diabetic patients frequently have peripheral vascular disease. This makes it difficult to produce a large drop of blood after a fingerstick. To improve blood flow, be sure to hold patient's finger in dependent position before puncturing.

24. Obtain test results.
- Exposure of blood to test strip for prescribed time ensures proper results.

Critical Decision Point: Some meters (such as OneTouch [LifeScan]) require blood sample to be applied to test strip already in the meter. Once the drop of blood is applied, the meter automatically calculates the reading.

- A. Be sure meter is still on. Bring test strip in the meter (in this example, an Accu-Check) to the drop of blood (see Step 24A illustration). The blood will be absorbed into the test strip (see manufacturer's instructions).
- Blood is absorbed into strip, and glucose device will show message on screen to signal that enough blood is obtained.

Critical Decision Point: Do not scrape blood onto the test strips or apply blood to wrong side of test strip. This prevents accurate glucose measurement. Ensure enough blood is applied to completely fill the test window. Otherwise a false reading or error message will be displayed.

Continued

► SKILL 42-2 Blood Glucose Monitoring—cont'd

- B. The blood glucose test result will appear on the screen (see Step 24B illustration). Some devices beep when measurement is completed.



Step 24A Touch the test strip to the blood drop. Blood is absorbed into the test strip. **Source:** Courtesy of Accu-Chek Glucometer.

25. Turn meter off. Dispose of test strip, lancet, and gloves in proper receptacle.
26. Discuss test results with patient.
27. Reinspect puncture site for bleeding or tissue injury.
28. Compare glucose meter reading with normal blood glucose levels and previous test results.
29. Ask patient to discuss procedure.
30. Ask patient to explain test and results.

Unexpected Outcomes

Puncture site bruised and continues to bleed

Blood glucose level above or below target range

Glucose meter malfunction

Patient misunderstanding of procedure and results



Step 24B Results appear on meter screen. **Source:** Courtesy of Accu-Chek Glucometer.

- Meter is battery powered. Proper disposal reduces risk for needlestick injury and spread of infection.
- Discussion promotes participation and provides a perfect teaching opportunity for continued SMBG testing.
- Site is possibly a source of discomfort and infection.
- Comparison helps determine whether glucose level is normal.
- Discussion validates patient's level of learning.
- Results of test may cause anxiety. Patient may misunderstand specific step of procedure.

Related Interventions

- Apply pressure.
- Elevate hand above level of heart
- Notify health care provider.
- Continue to monitor patient.
- Check for medication orders regarding deviations in glucose level.
- Administer insulin or carbohydrate source as ordered, depending on glucose level.
- Notify health care provider.
- Review instructions for troubleshooting glucose meter.
- Repeat test.
- Call the 1-800 company phone number found at the back of every BG testing meter.
- Repeat instructions to patient.
- Have patient demonstrate procedure.

► SKILL 42-2 Blood Glucose Monitoring—cont'd

Recording and Reporting

- In nurses' notes or special flow sheet, record procedure, glucose level, and action taken for abnormal range.
- Describe response, including appearance of puncture site, in nurses' notes.
- Record and report abnormal blood glucose levels.
- Stress importance of timing the testing of blood glucose levels, particularly in patients with diabetes mellitus.

Teaching Considerations

- Provide information on where a patient with diabetes mellitus can obtain testing samples, if applicable. When possible, teach with the same meter that the patient will use at home.
- Provide patient with information on where to obtain assistance if glucose meter has malfunctioned.
- Instruct patient in what to do and whom to contact if glucose meter malfunctions.

Pediatric Considerations

- Young children should be allowed to choose puncture site.
- Heel and great toe are common puncture sites in infants.
- It is necessary to assess for localized complications in heels of premature infants who must have blood drawn repeatedly.
- Heel warming facilitates obtaining a specimen from a neonate.
- Infection or abscess of the heel and necrotizing osteochondritis are the most serious complications of heelstick puncture in infants.
- To avoid osteochondritis, the puncture should not be deeper than 2.4 mm and is made at the outer aspect of the heel (Hockenberry & Wilson, 2007).
- The earlobe should be used to obtain blood in older pediatric patients (Pagana & Pagana, 2007).
- Young children should be allowed with parent to demonstrate technique; technique can be incorporated in play activity for further understanding.

Age-Related Considerations

- Warming fingertips may facilitate obtaining specimen.
- Some older adults have vision or dexterity problems that interfere with performing self-fingersticks.

Home Care Considerations

- Patients can use glucose meters routinely in their homes.
- Patients should be encouraged to attend a diabetic support group if it is needed.
- As visual acuity may affect a patient's ability to perform self-testing at home (Corbett, 2008), there are new BG testing meters that have talking ability.

Reproduced from Perry, A. G., & Potter, P. A. (2010). *Clinical nursing skills and techniques* (7th ed., pp. 1153–1158). St Louis, MO: Elsevier/Mosby.

gastric decompression and prevent vomiting or aspiration. If enteral nutrition therapy is to be administered for less than four weeks, nasoenteral tubes may be used. Surgical or endoscopically placed tubes are preferred for long-term feeding (>4 weeks) to reduce the discomfort of a nasal tube and to provide a more secure, reliable access (Pearce & Duncan, 2002). Patients with gastroparesis (decreased or absent innervation to the stomach causing delayed gastric emptying) or esophageal reflux, those at risk for aspiration, and those with a history of aspiration pneumonia require placement of tubes beyond the stomach into the intestine (Metheny, 2006).

Box 42-11 lists indications for enteral nutrition. The nurse inserts the nasoenteral tube (Skill 42-3), and the nurse or others, including family in the home setting, can administer enteral tube feedings. It is highly recommended that tube placement be verified by X-ray examination before the patient receives the first enteral feeding.

Enteral nutrition has been used successfully after surgery or trauma to provide fluids, electrolytes, and nutritional support. Gastric ileus may prevent nasogastric feedings, while nasointestinal or jejunostomy tubes allow successful postpyloric feeding of formula directly into the small intestine or jejunum or beyond the pyloric sphincter of the stomach

(Ellett, 2006). Enteral feedings can be administered through a nasoenteric tube (Skill 42-4) or via a gastrostomy or jejunostomy tube (Skill 42-5).

Initiating Enteral Tube Feedings

Enteral formulas are usually one of four types. **Polymeric formulas** (1.0 to 2.0 kcal/mL) include milk-based blenderized foods prepared by hospital dietary staff or in the patient's home. The polymeric classification also includes commercially prepared whole nutrient formulas. For this type of formula to be effective, the patient's gastrointestinal tract must be able to absorb whole nutrients. **Modular formulas** (3.8 to 4.0 kcal/mL) are single-macronutrient (e.g., protein, glucose, polymers, or lipids) preparations and are not nutritionally complete. This type of formula is added to other foods for meeting the patient's individual nutritional needs. **Elemental formulas** (1.0 to 3.0 kcal/mL) contain predigested nutrients that are easier for a partially dysfunctional gastrointestinal tract to absorb. Finally, **specialty formulas** (1.0 to 2.0 kcal/mL) are designed to meet specific nutritional needs in certain illnesses (e.g., liver failure, pulmonary disease, or human immunodeficiency virus [HIV] infection).

Text continued on p. 1099

► BOX 42-11 Indications for Enteral Nutrition

Cancer

- Head and neck
- Upper gastrointestinal tract

Critical Illness or Trauma

- Respiratory failure with prolonged intubation/inadequate oral intake
- Patients in critical care with suspected/evidence of catabolism
- Trauma patients, especially those in a hypermetabolic state (e.g., burns)

Neurological and Muscular Disorders

- Brain neoplasm
- Stroke
- Cerebrovascular accident
- Neuromuscular disorders (e.g., ALS, MS, Parkinson's Disease)
- Dementia:

Patients with advanced dementia are offered quality-of-life diets; they risk injury with multiple insertion related to self-extubation of feeding tubes. Enteral feeding for end-stage dementia is controversial. Common reasons to initiate enteral feedings in these patients include prolonging survival, improving quality of life, preventing pressure ulcers, and palliative care. A review of the literature reveals, however, that patients with dementia who have enteral tubes are more likely to be restrained and continue to experience weight loss and poor nutrition. Their rate of survival is not improved, and there is no evidence of improved quality of life or decrease in pressure ulcers (Sampson, Candy

& Jones, 2009). Accumulating evidence indicates that negative effects of tube feeding may outweigh potential benefits in individuals with advanced dementia.

- Myopathy
- Parkinson's disease

Gastrointestinal Disorders

- Enterocutaneous fistula
- Inflammatory bowel disease
- Mild pancreatitis

Other situations

Respiratory Failure With Prolonged Intubation Inadequate Oral Intake

- Continuous feedings
- Supine positioning

A 30-degree elevation is recommended when possible for supine patients to reduce their risk of aspiration and, if intubated, prevent ventilator associated pneumonia (Metheny, 2006).

- Supine position is an indication for enteral feeding. Enteral feedings may be provided at the same rate as in the prone position, since they are likely to have the same residual in either position (Ellett, 2006).
- Cerebral vascular accident
- Local trauma
- Anorexia nervosa
- Difficulty chewing and swallowing
- Severe depression

► SKILL 42-3 Inserting a Small-Bore Nasoenteric or Oral Tube for Enteral Feeding

Delegation Considerations

At most Canadian institutions, the insertion of a sump naso/orogastric tube without stylet is an advanced nursing competency, requiring one-time certification. The insertion of a silastic feeding tube with stylet is considered a delegated medical function requiring yearly recertification. For this reason, this skill should not be delegated to unregulated care providers or those without a certified competency.

Equipment

- Nasogastric or nasointestinal (orogastric or orointestinal) tube (8- to 12-Fr) with guide wire or stylet
- Stethoscope
- 60 mL or larger Luer-Lok or catheter-tip syringe
- Entriflex nasogastric feeding tubes with safe enteral connections. (This weighted polyurethane feeding tube is designed for nasogastric and naso duodenal feeding with a slimmer lighter weighted tip for easier insertion. The feeding port is incompatible with Luer-Lok or IV connections, reducing the risk of accidental connection or inadvertent administration of IV intended medications through the feeding tube, a practice started in Great Britain and the United States to address the JCAHO [2006] Tubing Misconnections Sentinel Alert.)
- Hypoallergenic tape and tincture of benzoin or tube fixation device
- Scissors
- pH indicator strip (scale 0.0 to 11.0)
- Medication cup or container for aspirated fluid
- Glass of water and straw (not required for intubated patients)
- Water-soluble lubricant
- Emesis basin
- Absorbent pad
- Facial tissues
- Disposable gloves (multiple pairs needed)
- Suction equipment in case of aspiration
- Penlight to check placement of nasopharynx
- Tongue blade
- Disposable tape measure
- Felt-tip marker

► SKILL 42-3 Inserting a Small-Bore Nasoenteric or Oral Tube for Enteral Feeding—cont'd

Procedure

STEPS

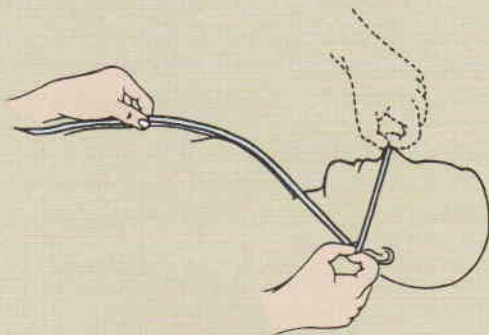
1. Assess patient's need for enteral tube feeding: NPO (nothing by mouth) status, functional gastrointestinal tract, inability to ingest sufficient nutrients.
 - A. Review physician's order for insertion of tube and enteral feeding schedule.
2. Explain procedure to patient.
3. Assess patency of nares. Have patient close each nostril alternately and breathe. Examine each naris for patency and skin breakdown.
4. Assess the gag reflex by placing a tongue blade in patient's mouth, touching uvula to induce a gag response.

RATIONALE

- Identifying patients who need tube feedings before they become nutritionally depleted may help to prevent complications related to malnutrition.
- Procedures and tube feedings require a physician's order.
- Patient can cooperate with the process.
- Nares may be obstructed or irritated, or a septal defect may be present.
- This activity assesses ability to swallow and determines whether the patient is at risk for aspiration.

Critical Decision Point: Patients with impaired level of consciousness, or who are intubated and sedated, may also have impaired gag reflex, and their risk of aspiration is increased during this type of procedure and subsequent tube feedings. For patients who are intubated, sedated, or too ill to participate in the procedure, ensure that the patient's head is *tilted toward* the chest for enteral feeding tube insertion.

5. Review patient's medical history for nasal problems (e.g., nosebleeds, oral or facial surgery, anticoagulation therapy, history of aspiration).
 6. Perform hand hygiene.
 7. Auscultate abdomen for bowel sounds.
 8. Explain procedure to patient and how to communicate during insertion by raising index finger to indicate gagging or discomfort.
 9. Stand on same side of bed as naris for insertion, and assist patient to high Fowler's position unless contraindicated. Place pillow behind patient's head and shoulders.
 10. Place absorbent pad over patient's chest. Keep facial tissues within reach.
 11. Determine length of tube to be inserted and mark with tape:
 - A. Traditional method for placing the tube to the stomach: Measure distance from tip of nose to earlobe and then to xiphoid process of sternum (see Step 11A illustration).
- Nasoenteral tubes are contraindicated in patients with recent nasal surgery, facial traumas, nosebleeds, surgical procedures requiring a transsphenoid approach (e.g., to remove pituitary tumours) or receiving anticoagulation therapy (Metheny, 2002).
 - Hand hygiene reduces transfer of microorganisms.
 - Absence of bowel sounds may indicate decreased or absent peristalsis and increased risk for aspiration or abdominal distension.
 - Explanations reduce anxiety and help patient assist in insertion.
 - These actions facilitate manipulation of tube. Fowler's position reduces risk of aspiration and promotes effective swallowing.
 - Pad prevents soiling of gown. Insertion of tube may cause patient's eyes to tear.
 - Length approximates distance from nose to stomach for 98% of patients. For duodenal or jejunal placement, an additional 20 to 30 cm is required.



Step 11A Length of tube to be inserted is equal to distance from tip of nose to earlobe to xiphoid process.

If placing the tube to small bowel (duodenum), follow agency-specific protocol; for example, the administration of 10 mg metoclopramide as a bowel motility agent, turning patient on right side, and injecting 200 cc of air to inflate the stomach.

Continued

► SKILL 42-3 Inserting a Small-Bore Nasoenteric or Oral Tube for Enteral Feeding—cont'd

12. Prepare nasogastric or nasointestinal tube for insertion according to manufacturer recommendation:
 - A. Plastic tubes should *not* be iced.
 13. Perform hand hygiene and put on gloves.
 - A. If long-term tube, inject 10 mL of water from 30 mL or larger catheter-tip syringe into the tube and insert stylet/guide wire.
 - B. Make certain that guide wire is securely positioned against weighted tip and that connections are snugly fitted together.
 14. Cut tape 10 cm long or prepare tube fixation device. Split one end of tape lengthwise 5 cm.
 15. Dip tube with surface lubricant into glass of water. If tube is not prelubricated, use water-soluble lubricant.
 16. Insert tube through nostril to back of throat (posterior nasopharynx). Aim back and down toward ear.
 17. Have patient tilt head toward chest after tube has passed through nasopharynx.
- Tubes that are iced become stiff and inflexible, causing trauma to mucous membranes.
 - Hygiene and gloves reduce transmission of microorganisms.
 - Water releases a mechanism in the tip of the tube holding the guide wire in place to enable the guide wire to be removed following tube insertion.
 - Secure positioning and snug-fitting connections promote smooth passage of tube into gastrointestinal tract. Improperly positioned stylet can induce serious trauma (i.e., tracheal perforation, pneumothorax).
 - Tape is used to anchor tubing after insertion.
 - Activates lubricant to facilitate passage of tube into naris to gastrointestinal tract.
 - Natural contour facilitates passage of tube into gastrointestinal tract and reduces gagging by patient.
 - Tilting head forward closes off glottis and reduces risk of tube entering trachea. This technique is also used in patients who are intubated and sedated.

Critical Decision Point: Encourage a patient who is alert and communicating to swallow by giving small sips of water or ice chips when possible. For patients who are intubated and sedated, or are not able to participate in the procedure, tilt patient's head toward the chest. Advance tube as patient swallows or as patient's head is tilted toward chest. Rotate tube 180 degrees while inserting.

18. Emphasize the need to mouth-breathe and swallow during the procedure (when possible).
 19. When tip of tube reaches the carina (about 25 cm in an adult), stop insertion, hold end of tube near your ear, and listen for air exchange from the distal portion of the tube.
 20. Advance tube each time patient swallows until desired length has been passed.
- Mouth-breathing and swallowing facilitate passage of tube and alleviate patient's fear during the procedure.
 - **If air is heard, the tube could be in the respiratory tract; remove tube and start over. This listening step should never be used to verify tube placement** (Metheny, 2006).
 - Advancing tube while patient swallows reduces discomfort and trauma to patient.

Critical Decision Point: Do not force tube insertion. If resistance is met or patient starts to cough, choke, or become cyanotic, stop advancing the tube and pull tube back. It is important to note that heavily sedated, comatose, or paralyzed patients may not exhibit a cough or gag reflex during insertion and so this should not be used as the sole method of determining improper tube placement. It is also possible to slip a small-bore feeding tube into the trachea down past an endotracheal tube without loss of oxygenation; therefore, X-ray is the definitive step in determining tube placement.

21. Check for position of tube in back of patient's throat with penlight and tongue blade.
 22. Perform measures to verify placement of tube, once desired length has been passed. Secure tube before X-ray examination, because it may become dislodged during procedure.
- Tube may be coiled, kinked, or entering trachea. (Withdraw tube immediately if tube is coiled, respiratory status of patient changes, or patient begins to cough and skin colour changes. If distress is not present, withdraw tube fully and retry. Note whether tube was kinked; if so, it is likely to kink again in the same place.)
 - Tube placement must be verified by X-ray examination before enteral feedings are initiated. Another test that can be done at the bedside to ensure ongoing placement is to measure pH of any aspirated gastric fluids.

Critical Decision Point: Auscultation is **not** a reliable method for verification of tube placement because a tube inadvertently placed in the lungs, pharynx, or esophagus can transmit a sound similar to that of air entering the stomach (Metheny, 2006; Richardson, et al., 2006; Wagner, 2004).

23. After gastric aspirates are obtained (see Box 42-4), anchor tube to patient's nose and avoid pressure on nares. Mark exit site with indelible ink. Select one of the following options:
 - A. Apply tape.
 - (1) Apply tincture of benzoin or other skin adhesive on tip of patient's nose and tube and allow it to become "tacky."
- A properly secured tube allows the patient more mobility and prevents trauma to nasal mucosa. Mark tube at tip of naris; measure from line to end of tube; tape and secure to maintain position.
 - Skin adhesive helps tape adhere better and protects patient's skin.

► SKILL 42-3 Inserting a Small-Bore Nasoenteric or Oral Tube for Enteral Feeding—cont'd

- (2) Place the intact end of tape over bridge of patient's nose. Wrap each of the 5 cm strips around tube as it exits nose. Change position of tube at naris every 8 hours (q8h) (see Step 23A(2) illustration).

B. Apply tube fixation device, using shaped adhesive patch.

- (1) Apply wide end of patch to bridge of nose.
(2) Slip connector around tube as it exits nose (see Step 23B(2) illustration).



Step 23A(2) Wrapping tape to anchor nasoenteral tube.



Step 23B(2) Slipping connector around feeding tube.

24. A second anchoring of tube against cheek with gauze and transparent dressing may be advised (Linford & McGinnisi, 2011). Do not allow tube to rest over bony points.
25. For intestinal placement, position patient on right side when possible until correct placement has been verified radiologically. Remove gloves. Perform hand hygiene, and assist patient to a comfortable position.

- Securing tape to nares prevents tissue necrosis. Changing tube position avoids erosion of naris.
- Fixation device secures tube and reduces friction on nares.

- Fastening the tube this way helps to prevent the tube from being pulled by confused patients and avoids pressure points.
- Positioning patient on right side promotes passage of the tube into the small intestine (duodenum or jejunum).

Critical Decision Point: Leave stylet/guide wire in place until correct position is ensured by X-ray film or check agency policy that states how long you can leave the wire or stylet in place if the X-ray or interpretation is delayed. Never attempt to reinsert partially or fully removed stylet/guide wire while feeding tube is in place.

Clinically sound judgement is always required for nasogastric insertion and placement verification. Cortrak is a device used to place small-bore tubes in an effort to improve efficiency and reduce patient discomfort by checking the placement as the tube is inserted at bedside. This reduces the need to verify placement. Cortrak involves computer technology to guide clinicians in the placement of nasoenteric feeding tubes. The device aids feeding tube placement by showing the relative location of the feeding tube tip as it descends into the tract. The tip of the feeding tube stylet has an electromagnetic transmitter. A receiver unit is placed on the patient's xiphoid during the procedure, to acquire the signal (Lei et al., 2007; Mackay et al., 2009).

26. Obtain X-ray film of abdomen.
27. Perform hand hygiene, apply clean gloves, and administer oral hygiene (see Chapter 37). Cleanse tubing at nostril.
28. Remove gloves, dispose of equipment, and perform hand hygiene.
29. Inspect patient's naris and oropharynx for any irritation after insertion.
30. Ask patient whether he or she feels comfortable.
31. Observe patient for any difficulty breathing or for coughing or gagging.
32. Auscultate lung sounds.

- Placement of tube is verified by X-ray examination (Ellett, 2006; Metheny & Meert, 2004).
- Oral hygiene promotes patient comfort and integrity of oral mucous membranes.
- These actions reduce transmission of microorganisms.
- If tube insertion was difficult, irritation of naris or oropharynx may have occurred.
- Patient's level of comfort is evaluated. (This may be a challenge if a language barrier exists or if the patient has dementia or is confused.)
- Improper position of the tube may cause these symptoms or increase symptoms in patients who have heart failure, pneumonia, asthma, and other cardiac or respiratory conditions.
- Abnormal lung sounds can be an early sign of aspiration.

Continued

► SKILL 42-3 Inserting a Small-Bore Nasoenteric or Oral Tube for Enteral Feeding—cont'd

Unexpected Outcomes

Aspiration of stomach contents into the respiratory tract (immediate response), evidenced by coughing, dyspnea, cyanosis, auscultation of crackles or wheezes

Aspiration of stomach contents into respiratory tract (delayed response), evidenced by dyspnea, fever, auscultation of crackles or wheezes

Development of bacterial aspiration pneumonia from contaminated saliva for patients NPO or being fed enterally.

Displacement of feeding tube to another site (e.g., from duodenum to stomach, which may occur when patient coughs or vomits)

Related Interventions

- Position patient on side.
- Suction nasotracheally and orotracheally.
- Consult physician immediately to order chest X-ray examination.
- Consult physician to obtain order for chest X-ray film.
- Prepare for possible initiation of antibiotics.
- Limited oral hydration leads to dry mouth and increased concentration of oral bacteria. It is imperative that scrupulous oral hygiene be maintained for these individuals, which includes using a soft tooth brush to clean teeth, gums, roof of mouth, and cheeks. Patients and their families must be counselled regarding this risk for those who are discharged home or maintain self-care (Canadian Stroke Network Best Practices, 2010).
- Confirm that mark on tube (made at initial insertion) is at exit site (if tube is moved, mark at new exit site).
- Remeasure distance from naris to tip, and compare with baseline measurement from insertion.
- Aspirate gastrointestinal contents and measure pH (Richardson et al., 2006).
- Discuss findings with physician.
- Reconfirm placement by X-ray film (optional).
- If tube is displaced, prepare to remove displaced tube, and insert and verify placement of new tube.
- If there is a question of aspiration, obtain chest X-ray film.

Critical Decision Point: To prevent clogging of feeding tube in relation to feedings, flush feeding tube with tap water (Best, 2009) after checking residual volume, after intermittent feeding, every four hours during continuous feedings, and before and after administration of medications. On average, use 15 to 30 mL or more of water for flushing. The amount of water required varies with the individual length of tube. Try to find an alternative route for medication administration when small-bore tubes (especially the temporary nasogastric silastic tubes) are used because they frequently clog.

Clogging of feeding tube

- To prevent feeding tube clogging that results from medication, use liquid forms of medication whenever possible. When the solid form of dosage is used, make sure tablets can be crushed and that there is no contraindication to crushing them (i.e., sustained-release cardiac meds should *not* be crushed as they will adversely affect the patient's hemodynamic status [HR and BP]) and capsules can be opened; dissolve tablets or capsules well, and administer each medication separately (Williams, 2008).
- Aspirate gastric contents with 60 mL syringe to assess patency of tube.
- Irrigate tube with water.
- Notify physician and prepare to administer pancrelipase upon physician order or standing protocol. Pancrelipase dissolves foodstuff but is ineffective in dissolving pill particles.
- Attempt to clear tube with pancrelipase using a 50 to 60mL syringe. Do *not* use a small-barrel syringe (i.e., 20 cm or less) because smaller syringes have greater psi (pounds per square inch) and injection of air or liquid under high pressure (above 40 psi) may cause tube rupture (Grant & Martin, 2000).
- Provide hygiene, and remove and replace tube. (Note: This action requires a physician's order.)
- Consider removing tube and inserting it into the other naris (physician order required).

Irritation of naris and nasal mucosa

Recording and Reporting

- Record and report type and size of tube placed, location of distal tip of tube (mark and measure), patient's tolerance of procedure, pH value, and confirmation of tube position by X-ray examination.

► SKILL 42-4 Administering Enteral Feedings via Nasoenteric Tube



Delegation Considerations

Administration of enteral tube feeding via nasoenteric tube is an institution-specific procedure that may or may not be delegated to unregulated care providers (UCPs) after the nurse verifies tube placement. The nurse is responsible for patient assessment. Depending on the institution's protocol, the nurse directs the UCPs to

- Ensure that the patient is sitting upright in a chair or in bed
- Infuse the feeding slowly
- Report any difficulty infusing the feeding or any discomfort voiced by the patient

Equipment

- Disposable feeding bag and tubing or ready-to-hang system
- 30 mL or larger Luer-Lok or catheter-tip syringe
- Stethoscope
- pH indicator strip (scale 0 to 14)
- Infusion pump (required for intestinal feedings): use pump designed for tube feedings
- Prescribed enteral feedings
- Disposable gloves
- Equipment to obtain blood glucose by fingerstick

Procedure

STEPS

1. Assess patient's need for enteral tube feedings: impaired swallowing, tracheostomy, decreased level of consciousness, head or neck surgery, facial trauma, surgical procedures involving upper alimentary canal.
2. Evaluate patient's nutritional status (see Table 42-6). Obtain baseline weight and laboratory values (e.g., albumin, transferrin, prealbumin). Assess patient for fluid volume excess or deficit, electrolyte abnormalities, and metabolic abnormalities, such as hyperglycemia.
3. Verify physician's order for formula, rate, route, and frequency and for laboratory data and bedside assessments, such as fingerstick blood glucose measurement.
4. Explain procedure to patient.
5. Perform hand hygiene.
6. Auscultate for bowel sounds before feeding.
7. Prepare feeding container to administer formula:
 - A. Check expiration date on formula and integrity of container.
 - B. Have tube feeding formula at room temperature.
 - C. Perform hand hygiene and apply gloves.
 - D. Shake formula container well, and fill feeding container with formula (see Step 7D illustration). Open stopcock on tubing and fill with formula to remove air.



Step 7D Pouring formula into feeding container.

RATIONALE

- Identify patients who need tube feedings before they become nutritionally depleted.
- Enteral feedings are intended to restore or maintain a patient's nutritional status. Fluid volume assessment provides objective data to measure effectiveness of feedings.
- Tube feedings, laboratory tests, and bedside tests must be ordered by the physician.
- Well-informed patients are cooperative and comfortable.
- Hand hygiene reduces transmission of microorganisms.
- Absence of bowel sounds may indicate decreased ability of gastrointestinal tract to digest or absorb nutrients.
- Tube feedings administered within the designated shelf life from a container without cracks or breaks reduces the patient's risk of acquiring tube feeding–borne gastrointestinal infections.
- Cold formula may cause gastric cramping and discomfort because the liquid is not warmed by the mouth and esophagus.
- Filling the tubing with formula prevents excess air from entering.
- Tubing must be free of contamination in order to prevent bacterial growth.

Continued

► SKILL 42-4 Administering Enteral Feedings via Nasoenteric Tube—cont'd



- E. Connect tubing to container as needed, or prepare ready-to-hang container.

Critical Decision Point: Tube feedings are infused by feeding pumps and the tubes do not fit intravenous (IV) pump.

8. For intermittent feeding, have syringe ready, and ensure formula is at room temperature.
9. Place patient in high Fowler's position, or elevate head of bed at least 45 degrees.
10. Verify tube placement (see Box 42-13). Consider the results from pH testing together with the aspirate's appearance.
 - Cold formula may cause gastric cramping.
 - Elevating the patient's head helps prevent aspiration.
 - On occasion, colour alone may differentiate gastric from intestinal placement. Because most intestinal aspirates are stained by bile to a distinct yellow colour and most gastric aspirates are not so stained, the difference may be distinguished. However, colour differences among the stomach and intestine are often difficult to discern, and the aspirate's colour must be considered in combination with other assessment data (Richardson et al., 2006).
 - pH ≤ 4 confirms gastric aspirate in adults while pH ≤ 5 confirms gastric aspirate in infants and young children (Gilbertson et al., 2011).
11. Check pH of aspirate; confirm measurement of length of tube from naris to tip of connection port; ensure original mark is in the same position.

Critical Decision Point: Auscultation is not considered a reliable method for verification of placement of tube because a tube inadvertently placed in lungs, pharynx, or esophagus can transmit sound similar to that of air entering stomach (Metheny & Meert, 2004; Serna & McCarthy, 2006).

12. Check for gastric residual.
 - A. Draw 30 mL of air with syringe. Connect to end of feeding tube. Flush tube with air.
 - B. Pull back evenly to aspirate gastric contents (see Step 12B illustration).



Step 12B Check for gastric residual (small-bore tube).

Please note that if checking for gastric residual when a small-bore tube is in place, consult agency policy. Aspirating flexible small-bore tubes is controversial as they tend to collapse more easily, making assessment of residuals inaccurate and can cause precipitates when mixed with high pH feedings and cause clogging (Kenny & Goodman, 2010). Remember that tube location is important. A tube in the small bowel would have ongoing secretions and much more residual and therefore checking residuals would not be necessary.

- C. Return aspirated contents to stomach if specified by agency policy.
 - Return of aspirate is also a controversial topic that requires further research. According to Booker et al. (2000), return of aspirate prevents fluid and electrolyte imbalance, although tube occlusions occur more frequently when aspirate is returned. In a random control trial, Juvé-Udina et al. (2009) found no differences in fluid balance or serum electrolyte outcomes and no tube clogging for those to whom gastric aspirate was returned (intervention group). The control group, however, suffered more distress, suggesting that returning the gastric aspirate could help maintain gastric residual volume at closer physiological levels.

► SKILL 42-4 Administering Enteral Feedings via Nasoenteric Tube—cont'd

video

13. Flush tubing with 30 to 50 mL of tap water at room temperature (Best, 2009).

14. Label feeding tube bag. Complete and post nutrition label on bag to indicate type of formula, rate, time, and date.

15. Initiate feeding:

A. Syringe or intermittent feeding:

- (1) Pinch proximal end of the feeding tube.
- (2) Remove plunger from syringe and attach barrel of syringe to end of tube.
- (3) Fill syringe with measured amount of formula (see Step 15A[3] illustration). Release tube and hold syringe high enough to allow it to empty gradually by gravity, and refill; repeat until prescribed amount has been delivered to the patient.
- (4) If feeding bag is used, hang feeding bag on an IV pole (see Step 15A[4] illustration). Fill bag with prescribed amount of formula, and allow bag to empty gradually over at least 30 minutes, depending on the amount of feeding.

• Ensure tube is clear and patent.

• Pinching prevents air from entering patient's stomach.

• Gradual emptying of tube feeding by gravity from syringe or feeding bag reduces risk of abdominal discomfort, vomiting, or diarrhea induced by bolus or too-rapid infusion of tube feedings.

• A feeding pump is used to infuse the formula. An intravenous pump must not be used for enteral feedings.



Step 15A(3) Fill syringe with formula.



Step 15A(4) Administration via feeding bag.

(5) Document tube assessment for placement, formula infusing, and infusion rate; elevate head of bed at least 45 degrees.

B. Continuous-drip method (see Step 15B illustration):

- (1) Prime and hang feeding bag and tubing.
- (2) Connect distal end of tubing to the proximal end of the feeding tube.
- (3) Connect tubing through infusion pump and set rate (see illustration).
- (4) Do *not* hang any longer than a four-hour supply to decrease risk of food spoilage potentially resulting in GI irritation or infection.

• Continuous feeding method is designed to deliver a prescribed hourly rate of feeding. This method reduces risk of abdominal discomfort. **Patients who receive continuous drip feedings should have residuals checked every four hours and tube placement verified.** Tube placement verification is difficult with continuous feeding because PH of formula affects the stomach pH. Measurement of gastric residuals every four hours is prudent in critically ill patients (Bankhead et al., 2009).



Step 15B Prime and connect tubing through infusion pump.

16. Advance the rate of tube feeding gradually (see Box 42-11).

• Tube feedings should be advanced gradually to prevent diarrhea and gastric intolerance to formula.

Continued

► SKILL 42-4 Administering Enteral Feedings via Nasoenteric Tube—cont'd



17. After intermittent infusion or at end of continuous infusion, flush nasoenteral tubing with water. On average, 30 mL of water is used, but the amount can vary from 10 mL to over 30 mL. Repeat every four to six hours. Remove gloves and perform hand hygiene.

- Flushing maintains patency of feeding tube and provides patient with a source of water to help maintain fluid and electrolyte balance.

Critical Decision Point: It may be necessary to consult with a dietitian to recommend a total free water requirement per day. This avoids the potential of fluid overload.

18. When tube feedings are not being administered (e.g., they may be held prior to tests or procedures such as extubation, cap or clamp the proximal end of the feeding tube).
19. Rinse bag and tubing with water whenever feedings are interrupted or q 8 h.
20. Change bag and tubing every 24 hours.
21. Measure amount of aspirate (residual) every 8 to 12 hours.
22. **Monitor fingerstick blood glucose level every 6 hours until maximum administration rate is reached and maintained for 24 hours.**
23. Monitor intake and output every 8 hours and compute 24-hour totals.
24. Weigh patient daily until maximum administration rate is reached and maintained for 24 hours; then weigh patient three times per week.
25. Observe patient's respiratory status.
26. Observe return of normal laboratory values.

- Closing the end of the tube prevents air from entering stomach between feedings and prevents contamination.
- Rinsing bag and tubing clears old tube formula and reduces bacterial growth.
- Changing bag and tubing reduces patient's exposure to bacterial growth occurring in those items.
- These measurements help evaluate tolerance of tube feeding.
- These levels alert the nurse to patient's tolerance of glucose. Remember that if feedings are stopped, monitor for any drop in glucose level—especially if patient is on an insulin therapy.
- Intake and output are indications of fluid balance or fluid volume excess or deficit.
- Weight gain is an indicator of improved nutritional status; however, sudden gain of more than 1 kg in 24 hours usually indicates fluid retention.
- Increased respiratory rate may indicate aspiration of tube feeding.
- Improving laboratory values (e.g., albumin, transferrin, and prealbumin) indicate an improved nutritional status.

Unexpected Outcomes (in addition to those identified in Skill 42-1)

Gastric residual exceeding 200 to 500 mL (Bankhead et al., 2009) (see Agency Policy)

Diarrhea three times or more in 24 hours

Nausea and vomiting

Related Interventions

- Withhold feeding.
- Notify physician. The North American Summit on Aspiration in the Critically Ill Patient has suggested that risk reduction be initiated because aspiration occurs significantly more often when gastric residual volumes are high (Bankhead et al., 2009; Metheny et al., 2008).
- Maintain patient in semi-Fowler's position, or have head of bed elevated at least 30 to 45 degrees.
- Perform physical assessment.
- Assess glycemic control.
- Minimize sedation.
- Consider administering motility agent.
- For residual exceeding 150 mL: **Recheck residual in one hour** (Metheny et al., 2008).
- Notify physician.
- Confer with dietitian.
- Institute skin-care measures.
- Look for other causes of the diarrhea (e.g., antibiotics). Consider change in antibiotics only for patients receiving antibiotics.
- Notify physician.
- Check patency of tube.
- Aspirate for residual.
- Auscultate for bowel sounds.

Recording and Reporting

- Record amount and type of feeding and patient's response to tube feeding, patency of tube, and any side effects.
- Report patient's tolerance and adverse effects.

Home Care Considerations

- Teach patient or primary caregiver how to determine correct placement of feeding tube using pH strips.
- Inform patient or primary caregiver of signs associated with pulmonary aspiration and delayed gastric emptying.
- Describe signs and symptoms associated with feeding tube complications, and advise when to call physician.

► SKILL 42-5 Administering Enteral Feedings via Gastrostomy or Jejunostomy Tube**Delegation Considerations**

Administration of enteral tube feeding via a gastrostomy or jejunostomy tube is a procedure that—depending on agency policy—can be delegated to an unregulated care provider (UCP) after the nurse verifies tube placement. UCPs should never test the position of the tube or give the first dose of a tube feeding.

- Ensure that the patient is sitting upright in a chair or in bed, and instruct the UCP to infuse the feeding slowly.
- Instruct the UCP to report any difficulty infusing the feeding or any discomfort voiced by the patient.

Procedure**STEPS**

1. Assess patient's need for enteral tube feedings (see Skill 42-3 and Skill 42-4): impaired swallowing, decreased level of consciousness, surgical procedures involving upper alimentary tract, need for long-term enteral nutrition.
2. Obtain baseline weight and laboratory values (blood glucose, albumin, transferrin, prealbumin).
3. Verify physician's order for formula, rate, route, and frequency.
4. Perform hand hygiene.
5. Explain procedure to patient.
6. **Auscultate for bowel sounds before feeding. Consult physician if bowel sounds are absent.**
7. Assess gastrostomy or jejunostomy site for breakdown, irritation, or drainage.
8. Perform hand hygiene and apply gloves.
9. Prepare feeding container to administer formula:
 - A. Have tube feeding formula at room temperature.
 - B. Connect tubing to container as needed, or prepare ready-to-hang bag.
 - C. Shake formula well. Fill container and tubing with formula.
10. For intermittent feeding, have syringe ready and ensure formula is at room temperature.
11. Elevate head of bed 30 to 45 degrees.
12. Apply gloves and verify tube placement.
 - A. Gastrostomy tube: Attach syringe and aspirate gastric secretions; observe their appearance and check pH. Return aspirated contents to stomach unless the volume exceeds 100 mL or specified amount based on patient's age. If the volume is greater than 100 mL or the specified amount on several consecutive occasions, check agency policy regarding stopping the feeding and notifying the physician.
 - B. Jejunostomy tube: Aspirate intestinal secretions, observe their appearance, and check pH.
13. Flush with 30 mL of room temperature tap water.

Equipment

- Disposable feeding container or ready-to-hang bag.
- 30 mL or larger Luer-Lok or catheter-tip syringe
- Formula
- Infusion pump: Use pump designed for tube feedings
- pH indicator strips (scale 0 to 14)
- Medication cup or container for aspirated fluid
- Stethoscope
- Disposable gloves
- Equipment to obtain blood glucose by fingerstick

RATIONALE

- This assessment identifies patients who need tube feedings before they become nutritionally depleted. Enteral feeding preserves the function and mass of the gut, promotes wound healing, diminishes hypermetabolism in burn injuries, and may decrease infection in critically ill patients (Ellett, 2006; Pearce & Duncan, 2002).
- Enteral feedings are intended to restore or maintain nutritional status. Baseline weight and laboratory values provide objective data to measure effectiveness of feedings.
- Tube feedings must be ordered by a physician.
- Hygiene reduces transmission of microorganisms.
- Well-informed patients are more cooperative and more at ease than patients who are ill-informed.
- Absence of bowel sounds may indicate decrease in or absence of peristalsis and increased risk of aspiration or abdominal distension.
- Infection, pressure from tube, or drainage of gastric secretions can cause skin breakdown.
- Cold formula may cause gastric cramping and discomfort because the liquid is not warmed by mouth and esophagus.
- Tubing must be free of contamination in order to prevent bacterial growth.
- Placement of formula through tubing prevents excess air from entering gastrointestinal tract.
- Cold formula may cause gastric cramping.
- Elevating patient's head helps prevent chance of aspiration.
- Fluid from gastric tube of patient who has fasted for at least four hours usually has a pH of 1 to 4, especially when patient is not receiving a gastric-acid inhibitor. Continuous administration of tube feedings may elevate pH (Metheny, 2006). Gastric residual indicates whether gastric emptying is delayed. Delayed gastric emptying for a gastrostomy tube may be indicated by 100 mL or more remaining in patient's stomach from previous feeding (Bourgault et al., 2007).
- Presence of intestinal fluid indicates that the end of the tube is in the small intestine (i.e., the duodenum or jejunum). In general, the intestinal residual is very small (10 mL or less). If fluid appears acidic on pH test, if fluid looks like gastric fluid, or if the residual volume is large (more than 10 mL), displacement of the tube into the stomach may have occurred.

Continued

► SKILL 42-5 Administering Enteral Feedings via Gastrostomy or Jejunostomy Tube—cont'd**14. Initiate feedings:****A. Syringe feedings:**

- (1) Pinch proximal end of gastrostomy or jejunostomy tube.
- (2) Remove plunger and attach barrel of syringe to end of tube; then fill syringe with formula.
- (3) Release tube and elevate syringe. Allow syringe to empty gradually by gravity. Refill until prescribed amount has been delivered to patient.

B. Continuous drip method:

- (1) Verify that volume in container is sufficient for length of feeding (four to eight hours, check manufacturer's recommendations).
- (2) Hang container on IV pole, and clear tubing of air.
- (3) Thread tubing into pump according to manufacturer's directions.
- (4) Connect tubing to end of gastrostomy or jejunostomy tube.
- (5) Begin infusion at prescribed rate.

15. Administer water via feeding tube as ordered with or between feedings.**16. Flush tube with 30 mL of water every four to six hours and before and after administering medications via feeding tube.****17. When tube feedings are not being administered, cap or clamp the proximal end of the gastrostomy or jejunostomy tube.****18. Rinse container and tubing with water after all intermittent feedings.****19. Assess skin around tube exit site. Before site has healed, clean with normal saline. The skin around the tube should be cleansed daily with warm water and mild soap once site has healed. Fully healed tubing exit site is left open to air. Prior to healing, a small precut gauze dressing may be applied to exit site and secured with tape. The dressing is assessed for drainage and changed daily and as needed. If patient received nasogastric feedings before tube insertion and then undergoes a procedure, tube is not used for first four to six hours after procedure. (Patient will be NPO status the night before the procedure. Postprocedure documentation—as per agency policy—will indicate when to use tube.) Feeding will resume at previous nasogastric rates once it is safe to begin feeding.****20. Dispose of supplies, and perform hand hygiene.****21. Evaluate patient's tolerance to tube feeding. Measure the amount of aspirate q 8 to 12 hours.**

- Gastrostomy and jejunostomy feedings are usually given continuously to ensure proper absorption. However, initial feedings may be given by bolus to assess patient's tolerance to formula. See Box 42-11 for guidelines to advance enteral feedings.
- Pinching prevents excessive air from entering the patient's stomach and prevents the leaking of gastric contents.
- Gradual administration of tube feedings by gravity reduces the risk of diarrhea induced by bolus tube feedings.
- Continuous-feeding method is designed to deliver a prescribed hourly rate of feeding. This method reduces the risk of diarrhea and risk of abdominal discomfort. Patients who receive continuous-drip feedings should have residuals checked every four hours and tube placement verified. Measurement of gastric residuals every four hours is prudent in critically ill patients (Bankhead et al., 2009).
- Over the long term, you must continue assessing residuals at least every six hours for patients considered at risk for aspiration. Gastric residual volumes can be reduced to every six to eight hours in noncritically ill patients after the first 48 hours of being fed (Bankhead et al., 2009).
- Hanging the container allows for gravity-based flow of formula, which prevents accumulation of air in the patient's stomach.
- Water helps patients maintain fluid and electrolyte balance.
- Flushing maintains patency of tube and provides patient with some free water. Small jejunal tubes are prone to clogging and are difficult to replace (Pearce & Duncan, 2002).
- Closing the end of the tube prevents excess air from entering the gastrointestinal tract between feedings and prevents leakage of gastric contents.
- Rinsing clears formula from tubing and reduces bacterial growth in container and tubing. The container and tubing should be changed every 24 hours.
- Report any drainage, redness, swelling, or displacement of the tube to the physician. Leakage of gastric drainage may cause skin irritation.
- Postprocedure monitoring is performed to check for bleeding.
- Hygiene prevents transmission of microorganisms.
- Measurements help evaluate tolerance of tube feeding.

► SKILL 42-5 Administering Enteral Feedings via Gastrostomy or Jejunostomy Tube—cont'd

- 22. Monitor fingerstick blood glucose level every 6 hours until maximum administration rate is reached and maintained for 24 hours.
 - 23. Monitor intake and output every 24 hours.
 - 24. Weigh patient daily until maximum administration rate is reached and maintained for 24 hours; then weigh patient three times per week.
 - 25. Observe return of normal laboratory values.
 - 26. Inspect stoma site for signs of impaired skin integrity.
- Alerts nurse to patient's tolerance of glucose.
 - Intake and output are indications of fluid balance or fluid volume excess.
 - Weight gain is an indicator of improved nutritional status; however, a sudden gain of more than 1 kg in 24 hours usually indicates fluid retention.
 - Improving laboratory values (albumin, transferrin, prealbumin) indicate improved nutritional status.
 - Enteral tubes can cause pressure and excoriation at the stoma site. In addition, gastric secretions irritate patient's skin.

Unexpected Outcomes

Aspiration of formula when gastric emptying is delayed or formula is administered too rapidly and produces vomiting

Skin breakdown around gastrostomy or jejunostomy site

Related Interventions

- Position patient in side-lying position.
- Suction airway.
- Notify physician.
- Obtain chest X-ray film.
- Institute skin care practices.
- Use pressure relief measures around tube.
- Provide appropriate wound care (see Chapter 46).

Recording and Reporting

- Record amount and type of feeding and patient's response to tube feeding, patency of tube, stoma site, and skin integrity, and document any side effects.
- Report to incoming nursing staff type of feeding, status of feeding tube, patient's tolerance, and adverse effects.

Home Care Considerations**Teaching Patient or Primary Caregiver How to Determine Correct Placement of Feeding Tube**

- Aspirate and check pH.
- Measure tube length.

Signs Associated With Pulmonary Aspiration and Delayed Gastric Emptying

- Advise patient or primary caregiver to be alert for increased or laboured breathing.
- Instruct patient or caregiver to report shortness of breath.
- Instruct patient or caregiver to report enlarged or tender abdomen.
- Instruct patient or caregiver to be alert for residuals exceeding 200 mL (increased residuals may be related to aspiration) (Metheny et al., 2008).

Reinforcing Signs and Symptoms Associated With Feeding Tube Complications and When to Call Physician

- Shortness of breath
- Laboured breathing
- Cramping, vomiting
- Diarrhea two to three times per day
- Constipation
- Tube occlusion
- Tube length increase of 3 to 5 cm or dislodgement

Tube feedings are typically started at full strength at slow rates (Box 42-12). The hourly rate is increased every 12 to 24 hours if no signs of intolerance (nausea, cramping, vomiting, diarrhea) appear.

Studies have demonstrated a beneficial effect of enteral feedings in comparison with parenteral (intravenously administered) nutrition. Feeding by the enteral route may reduce sepsis, blunt the hypermetabolic response to trauma, and maintain intestinal structure and function (Gramlich et al., 2004). To remove the tube, use the following procedure (Box 42-13).

Preventing Complications

A serious complication associated with enteral feeding is aspiration of enteral formula into the tracheobronchial tree.

Aspiration of enteral formula into the lungs irritates the bronchial mucosa, resulting in decreased blood supply to affected pulmonary tissue (Metheny, 2006). This leads to necrotizing infection, pneumonia, and potential abscess formation. The high glucose content serves as a bacterial medium for growth, thereby promoting infection. Adult respiratory distress syndrome is also frequently associated with pulmonary aspiration. Common conditions that increase the risk of aspiration include coughing, nasotracheal suctioning, an artificial airway, decreased level of consciousness, and lying flat during and after feeding.

Researchers have investigated the problems associated with nasoenteral tube placement, type of feeding instilled, rate of feeding, and complications associated with tube feeding.

► BOX 42-12

Advancing the Rate of Tube Feeding

Intermittent

1. Start formula at ordered concentration.
2. If based on physician order and agency policy, infuse bolus of formula over at least 20 to 30 minutes via syringe or feeding container.
3. Begin feedings with no more than 150 to 250 mL at one time. Increase incrementally by 50 mL per feeding per day to achieve needed volume and calories in six to eight feedings. The amount of increase varies depending on age of patient and tolerance. Rates for pediatric patients may increase by 5 to 10 mL per 8 to 24 hours while rates for adults may be increased by 50 mL per feeding per day. (Note: Concentrated formulas at full strength may be infused at slower rates until tolerance is achieved.)

Continuous

1. Start formula at ordered concentration full strength for isotonic formulas; concentration of all nutrients in the formula is the same as the concentration of plasma—the fluid component of blood—at approximately 300 mOsm/kg water) or at ordered concentration. Usually hypertonic formulas are also started at full strength but at a slower rate because hypertonic formulas create a pressure gradient that draws water into the intestine and may cause diarrhea and cramping.
2. Begin infusion rate at designated rate.
3. Advance rate slowly (e.g., 10 to 20 mL/hour per day, depending on patient's age) to target rate if tolerated (tolerance indicated by absence of nausea and diarrhea and by low gastric residuals).

► BOX 42-13 Procedural Guideline

Discontinuing Enteral Feedings via Nasogastric Tube**Equipment:**

- Clean gloves, facial tissues, towel or absorbent pad, disposable bag

Procedure:

1. Check the physician's order to discontinue nasogastric tube.
2. Educate patient about what to expect during procedure:
 - A. Patient may experience irritation of nose and throat, as well as watering of the eyes.
 - B. Encourage patient to breathe out as the tube is being removed, to promote comfort and ease of removal.
3. Perform hand hygiene and apply gloves.
4. Assist patient to sit up in high Fowler's position, if possible (to protect patient from drainage). Encourage patient participation.
 - A. Place towel over patient's chest.
 - B. Provide tissues to patient.
5. Disconnect tube from pump and from patient's gown.
6. Ask patient to take a deep breath and exhale slowly; pinch tube and withdraw it slowly.
7. Provide oral care to patient; provide skin care around patient's nares.
8. Document procedure and total fluid balances.



Figure 42-11 Enteral tubes, small bore.

Small-bore feeding tubes create less discomfort for patients and are currently most often used (Figure 42-11). For adults, most of these tubes are 8 to 12 Fr and 91 to 109 cm long. A stylet is often used during insertion of a small-bore tube to stiffen it. The stylet is removed when the correct position of the feeding tube is confirmed.

At present, the most reliable method for verification of placement of small-bore feeding tubes is X-ray examination (Box 42-14). Measuring the pH of secretions withdrawn from the feeding tube may also help differentiate the location of the tube (Box 42-15). Patients who take acid inhibitor medications usually have an acidic pH value ranging from 4.0 (after four hours of fasting) to 6.0 (with continuous enteral nutrition infusion). In contrast, intestinal aspirate has a pH of 7.8 to 8.0. More precise indicators are needed to help differentiate the source of tube feeding aspirate (Ellett, 2006; Metheny, 2006).

Major complications of enteral nutrition are outlined in Table 42-8. Of special note, severely malnourished patients are at risk for electrolyte disturbances from **refeeding syndrome** (metabolic disturbances that occur as a result of reinstituting nutrition) because cations such as potassium, magnesium, and phosphate move intracellularly during enteral nutrition or parenteral nutrition therapy. There are also situations where enteral nutrition is not effective in nourishing the body and your role as a nurse is to support a patient in a different way. Box 42-16 describes a story of a nurse who learned that nourishing a person's soul is important.

Large-Bore Tube and Nasogastric or Orogastric Suctioning

Gastric decompression is the use of suction to drain the stomach to relieve blockage of the intestinal tract, to wash out stomach contents when a person has taken poisonous material, or after surgery (Dugas & Knor, 1995).

After surgery, the objectives for drainage are as follows:

- Reduce abdominal distension
- Speed the return of bowel function
- Reduce the chance of wound dehiscence and hernia

The two types of tubes most commonly used for gastric decompression are the Levine and Salem sump tube. The tubes are large: 16 to 18 Fr are commonly used and may be inserted through nares or orally if deemed necessary. Orogastric tubes are often placed in patients with facial fractures or sinusitis (Dugas & Knor, 1995). (See Skill 42-6 and Box 42-17.)

★ BOX 42-14 RESEARCH HIGHLIGHT

Accuracy in Determining Placement of Feeding Tubes

Research Focus

Two possible adverse outcomes of enteral nutrition are (1) accidental placement of a nasogastric feeding tube into the lung and (2) pulmonary aspiration of gastric contents.

Research Abstract

No one knows the precise incidence of accidental tube misplacements into the lung, but estimates of close to 5% have been cited. Patients at highest risk are those with a decreased level of consciousness; those who are confused, uncooperative, or agitated; those who have an endotracheal tube; those who have undergone recent extubation; and those with poor gag reflex. A feeding tube accidentally inserted into the lung may end in the tracheobronchial tree or may perforate into the pleural space. In either event, efforts are made to detect the misplacement before the introduction of tube feedings because inadvertent infusion of formula into the lung promotes tissue consolidation, pneumonia, and respiratory failure. The most accurate method for checking feeding tube placement is X-ray examination; the most effective nonradiological method is aspirating fluid from the feeding tube, measuring its pH, and describing its appearance. Although observing for respiratory distress is helpful in alert patients (especially when firm large-diameter tubes are used), it is of little benefit in those who have a decreased level of consciousness and when small-bore tubes are used. Risk factors for pulmonary aspiration in tube-fed patients include feeding into the stomach in the presence of gastric atony (which results in high gastric residual volumes), poor gag reflexes, mechanical ventilation, and flat positioning in bed. Bedside methods used to detect pulmonary aspiration are not well defined.

References: Alsolaiman, M. M., & Howard, L. (2003). FD and Blue Dye No. 1 and Blue Nail Discoloration: Case report. *Nutrition*, 19, 395–396; Baskin, W. N. (2006). Acute complications associated with bedside placement of feeding tubes. *Nutrition in Clinical Practice*, 21(1), 40–55; Bourgault, A. M., Ipe, L., Weaver, J., et al. (2007). Development of evidence-based guidelines and critical care nurses' knowledge of enteral feeding. *Critical Care Nurse*, 27(4), 17–30; Ellett, M. L. (2006). Important facts about intestinal feeding tube placement. *Gastroenterology Nursing*, 29(2), 112–125; Health Canada. (2003b). Safety warning concerning the use of blue food dye in enteral feedings. Retrieved from http://www.hc-sc.gc.ca/dhp-mps/medeff/advisories-avis/prof/_2003/food_dye-colorant_nth-ah-eng.php; Metheny, N. A. (2009). AACN practice alert: Dye in enteral feeding. Retrieved from <http://www.docstoc.com/docs/27372726/DYE-IN-ENTERAL-FEEDING>; and Richardson, D. S., Branowicki, P. A., Zeidman-Rogers, L., et al. (2006). An evidence-based approach to nasogastric tube management: Special considerations. *Journal of Pediatric Nursing*, 21, 388–393.

Evidence-Informed Practice

- Radiography is the most reliable method available to confirm correct feeding tube location, and radiographic verification is required in most acute care facilities when small-bore tubes are initially inserted.
- When the radiographic method is not feasible, a less reliable method involves testing the feeding tube aspirate's pH and observing its appearance. A properly obtained pH of 0 to 4 is a good indication of gastric placement; a pH of 6 or higher could indicate placement in the lung, intestine, or even the stomach, in which gastric pH is usually high. Intestinal fluid is usually bile-stained (dark golden yellow); in contrast, gastric fluid is usually grassy green, off-white to tan, or clear and colourless.
- A secondary method to confirm placement consists of marking the feeding tube with indelible ink at the exit site from the naris or lip at the time of radiography. You must confirm this mark before feeding or administering medication through the tube. Also record the measurement from naris to end of tube. The exit-point mark is not a foolproof indication of correct tube placement, inasmuch as the tube's distal tip can move from its original position while the external portion remains intact.
- **The auscultatory method should not be used to determine tube location.**
- The dye method (adding blue food colouring to enteral formula to assist with the detection of formula aspirated into the lung) is questioned because the absence of blue-stained tracheobronchial secretions does not rule out pulmonary aspiration. Health Canada (2003b) issued a public health advisory reporting an association between use of Blue No. 1 food colouring and patient deaths.



► BOX 42-15 Procedural Guideline

Obtaining Gastrointestinal Aspirate for pH Measurement, Large- and Small-Bore Feeding Tubes: Intermittent and Continuous Feeding

Critical Decision Point: Obtaining gastrointestinal aspirate for pH measurement to verify placement is crucial, whether a large- or small-bore tube is used and whether the tube will be used for decompression or feeding. *Note:* An X-ray examination to verify tube placement must be completed before enteral feedings are initiated.

Delegation Considerations:

The skill of measuring pH in gastrointestinal aspirate should *not* be delegated to unregulated care providers.

Equipment:

- 60 mL syringe
- pH test paper (scale of 0 to 11)
- Absorbent pad
- Small medication cup
- Disposable gloves

Procedure:

1. Perform hand hygiene. Perform measures to verify placement of tube:
 - A. For intermittently fed patients, test placement immediately before feeding (usually a period of at least four hours will have elapsed since previous feeding). More frequent checking has been associated with increased clogging of small-bore tubes. To avoid clogging, flush tube with 30 mL of water after aspirating for the residual volume (Bourgault et al., 2007).
 - B. For continuously tube-fed patients, check agency policy. If the patient is tolerating the feedings without incident and other indicators of correct location are present (the mark on the tube at the exit site has remained in its original position, and the most recent X-ray films confirm correct position of tube), it is reasonable to continue feedings. **If risk of tube displacement is high and the tube has moved, consider the need for an X-ray film to verify placement** (Metheny, 2006; Richardson et al., 2006). Plan to test pH at times when feeding may be withheld (e.g., during diagnostic testing, during chest physical therapy, or to avoid medication interaction).

Continued

► BOX 42-15 Procedural Guideline—cont'd

- C. Wait at least one hour after medication administration by tube or mouth.
2. Apply disposable gloves.
3. Draw 30 mL of air, or an equivalent amount for infants and children, into syringe, then attach syringe to end of feeding tube. Flush tube with the 30 mL of air to clear out formula or medications before attempting to aspirate fluid. It will probably be more difficult to aspirate fluid from the small intestine than from the stomach. Repositioning the patient from side to side may be helpful. More than one bolus of air through the tube may be needed in some cases.
4. Draw back on syringe and obtain 5 to 10 mL of gastric aspirate. Observe appearance of aspirate (see illustration Step 4A). Gently mix aspirate in syringe. Then expel a few drops into a clean medicine cup. Dip the pH strip into the fluid or apply a few drops of the fluid to the strip (see illustration Step 4B). Compare the colour of the strip with the colour on the chart provided by the manufacturer.
 - A. The pH of gastric fluid usually ranges from 1 to 4 (Bourgault et al., 2007).
 - B. The pH of intestinal fluid is usually higher than 6.



Step 4A Gastrointestinal contents. A, Stomach. B, Stomach. C, Intestinal. **Source:** Courtesy of Dr. Norma A. Metheny, Professor, St Louis University School of Nursing.

- C. Patients with continuous tube feeding may have a pH of 5 or higher.
- D. The pH of pleural fluid from the tracheobronchial tree is generally higher than 6.
5. Remove gloves and discard supplies. Perform hand hygiene.

Critical Decision Point: If after repeated attempts it is not possible to aspirate fluid from a tube that was originally confirmed by X-ray examination to be in the desired position, the tube is considered correctly placed if (1) no risk factors for tube dislocation exist, (2) the tube has remained in the original taped position and the tube's measurement remains constant, and (3) the patient is not experiencing difficulty (Metheny, 2006; Richardson et al., 2006). If in doubt, repeat radiographic examination of patient to confirm placement.

Major complications of enteral nutrition are outlined in Table 42-8. Of special note, severely malnourished patients are at risk for electrolyte disturbances from refeeding syndrome (metabolic disturbances that occur as a result of reinstituting nutrition) because cations such as potassium, magnesium, and phosphate move intracellularly during enteral nutrition or parenteral nutrition therapy.



Step 4B Comparing pH strip with colour chart.

BOX 42-16 NURSING STORY

Nourishing the Body, Nourishing the Soul: A Lesson in Enteral Nutrition and Life*

Jack was one of those patients who lingers in your mind and heart long after you are no longer providing care. I was a newly graduated nurse working on a busy medical unit, and Jack had been admitted several times for complications related to COPD (chronic obstructive pulmonary disease). Jack enjoyed interacting with the nurses and was quick to laugh. On one admission, Jack had suffered a stroke that affected his swallowing and mobility. His cognitive function remained intact and although his speech was a bit slurred, he was still able to communicate.

After weeks of enteral feedings, trials of oral intake, and swallowing assessments, it was decided that Jack would require long-term enteral feedings related to his swallowing dysfunction as the risk of aspiration pneumonia was too great to use oral feedings. Jack, unhappy with this assessment, was quieter than usual. He was a man who thoroughly enjoyed his food and found great pleasure in the daily rituals of eating and drinking. One evening as I connected his tube feedings, Jack looked at me and said, "You know, even people on death row get one last meal." I was relieved Jack was finally talking about this loss and found it fitting he chose humour to deal with it. When I asked Jack what his last meal would have been, he replied, "A big steak, mashed potatoes, and fiddleheads" (a green vegetable grown on riverbanks in the Maritime provinces).

From this experience, I became more appreciative of the taste and textures of the foods I ate, and the basic functions I had always taken for granted. Jack would often tease me about the food I had eaten, appalled that I had never eaten fiddleheads. When I told him I had finally tried them (yuck!) and that they must be an acquired taste, Jack's laugh was infectious!

Jack was discharged to a long-term care facility in his small town. A year later, he appeared again on my patient list, sadly, this time in palliative care. As I went to see him, I saw a man with dimmed physical strength but the same blue eyes. He could no longer communicate verbally, but his eyes showed that he remembered me. I cared for him for several days, talking about familiar subjects and sharing with him some of my jokes. This time, I felt I was nourishing his soul, versus nourishing his body.

Jack's children had rallied around him in the last days, and from them I was able to learn more about his life. One morning as they left the nursing unit to have breakfast and time to themselves, I assured them I would be with their father. I sat with Jack and rubbed his feet with lotion, while I gently talked to him. His laboured breathing eventually stopped and as I held his hand, he passed away. I was sad his family was not with him but also honoured to be present with him during his last moments.

As nurses, we can learn much about life from our patients. Jack taught me about nourishment ... of the mind, body, and soul, a lesson never to be forgotten.

*By Cheyanne Wyers, BN, RN.

► TABLE 42-8 Complications of Enteral Tube Feeding

Problem	Possible Cause	Intervention
Pulmonary aspiration	Regurgitation of formula Feeding tube displaced Patient in supine position	Verify tube placement Reposition tube and verify tube placement Elevate head of bed 30 to 45 degrees during feedings and for two hours afterward
	Deficient gag reflex	Reassess for return of normal gag reflex; until then, place patient on aspiration precautions and place patient in supine position
Diarrhea	Gastroesophageal reflux disease	Verify tube placement
	Delayed gastric emptying	Lower rate of delivery to increase tolerance
	Hyperosmolar formula or medications	Deliver formula continuously, deliver at lower rate, dilute formula, or change to isotonic enteral nutrition (physician order required and may consult with dietitian)
	Allergy to elixir ingredients (sorbitol)	Liquid medications are often sweetened with sorbitol; consider this as possible cause of diarrhea
	Antibiotic therapy	Antibiotics may destroy normal intestinal flora; physician may change medication; treat symptoms with antidiarrheal agents
Constipation	Bacterial contamination	Do not hang formula longer than 4–8 hours in bag; wash bag out well when refilling; change tube feeding bags q24h; use aseptic practices
	Malabsorption	Check expiration dates Check for pancreatic insufficiency; use low-fat, lactose-free formula and continuous feedings
	Lack of fibre	Select a formula containing fibre
	Lack of free water	Add water as needed as flushes*
	Medications	Evaluate side effects; suggest stool softener or bulk-forming laxative
Tube occlusion	Inactivity	Monitor patient's ability to ambulate; collaborate with physician for activity order or physiotherapy
	Pulverized medications given per tube	Irrigate with 30 mL water before and after each medication per tube*
	Insufficient tube irrigation	Ideally, each medication should be given separately
Tube displacement	Sedimentation of formula	Dilute crushed medications if not liquid
	Reaction of incompatible medications or formula	Shake cans well before administering (read label) Read pharmacological information on compatibility of drugs and formula
	Coughing, vomiting	Replace tube and confirm placement before restarting tube feeding
Abdominal cramping, nausea, or vomiting	Tube not taped securely	With placement verification, check that tape is secure (nasogastric)
	High osmolality of formula	Suggest an isotonic formula, or dilute current formula
		Suggest use of lactose-free formula
		Stop feeding if there is a risk of gastrointestinal tract obstruction
		Use greater proportion of carbohydrate
Delayed gastric emptying		Warm formula to room temperature
	Rapid increase in rate or volume	Lower rate of delivery to increase tolerance
	Delayed gastric emptying	If the gastric residual is >250 mL after a second gastric residual check, a promotility agent should be considered
		A full assessment should be conducted to find out reason for high level
		Suggest use of lactose-free formula
Serum electrolyte imbalance	Lactose intolerance	Stop feeding if there is a risk of gastrointestinal tract obstruction
	Intestinal obstruction	Use greater proportion of carbohydrate
	High-fat formula used	Warm formula to room temperature
	Cold formula used	Consult with physician regarding medication for increasing gastric motility
	Diabetic gastroparesis	Check for residual (see agency policy)
Increased respiratory quotient	Prematurity	Consult physician regarding advancing tube to intestinal placement
	Inactivity	Monitor medications and pathological conditions that may affect gastrointestinal motility
	Excess gastrointestinal losses	Monitor serum electrolyte levels daily
	Dehydration	Provide free water as per dietitian's recommendation
	Cirrhosis	Know of links with specific pathological condition
	Heart failure, edema	Monitor patient's weight
	Diabetes mellitus	Monitor glucose tolerance and type of feedings
	Overfeeding of carbohydrates	Balance kilocalorie needs provided from fat, protein, and carbohydrate with greater proportion of fat in formula (to decrease CO ₂ production)

Continued

► **TABLE 42-8** Complications of Enteral Tube Feeding—cont'd

Problem	Possible Cause	Intervention
Fluid overload	Refeeding syndrome in malnutrition Excess free water or diluted (hypotonic) formula	Restrict fluids if necessary, and use either a specialized formula or a diluted enteral formula at first Monitor levels of serum proteins and electrolytes Use a more concentrated formula with fluid volume excess that does not carry a risk of refeeding syndrome
Hyperosmolar dehydration	Hypertonic formula with insufficient free water	Slow rate of delivery, dilute, or change to isotonic formula

*Check first for fluid restrictions that would affect volume of water given. A physician's order is required to add free H₂O; this will be patient-specific.

► **BOX 42-17** Procedural Guideline**Providing Suction****Equipment:**

- Suction device, connecting tubing (connector as required)

Procedure:

1. Check the physician's order for type and amount of suction.
Suctioning may be ordered as continuous or intermittent.
The amount must be ordered by the physician.
2. To reduce patient's anxiety, educate patient about procedure.
3. Wash hands thoroughly to limit spread of microorganisms.
4. Set up suction device as per institution or agency policy.
5. Set type and amount of suction as ordered.

6. Monitor patient and suction system regularly. Provide data for overall care. Monitor for bleeding or blockage:

Patient: Note abdominal distension, nausea, feeling of discomfort, bowel sounds, electrolyte levels.

Device: Note kinks, blockages, flow, and settings.

Drainage: Note amount, colour, and consistency.

7. Secure tubing as described in preceding enteral nutrition section. Keep tubing higher than stomach to facilitate drainage. Secure tubing to prevent inadvertent pulling or removal.
8. Measure output at least every eight hours or as per institutional or agency policy.
9. Document as per institution or agency protocol.

► **SKILL 42-6** Inserting a Large-Bore Nasoenteric or Orogastric Tube for Gastric Suctioning**Delegation Considerations**

This skill requires problem solving and knowledge application unique to a professional nurse. For this reason, this skill should *not* be delegated to unregulated care providers.

Equipment

- Nasogastric or nasointestinal (orogastric or orointestinal) tube (12- to 18-Fr)
- Stethoscope
- 60 mL or larger Luer-Lok or catheter-tip syringe
- Hypoallergenic tape and tincture of benzoin or tube fixation device
- Scissors
- pH indicator strip (scale of 0 to 14)
- Glass of water and straw (not required for intubated patients)
- Water-soluble lubricant
- Emesis basin
- Absorbent pad
- Facial tissues
- Disposable gloves (multiple pairs needed)
- Suction equipment in case of aspiration
- Penlight to check placement of nasopharynx
- Tongue blade
- Disposable tape measure
- Felt-tip marker
- Suction device for continuous or intermittent suctioning

Procedure**STEPS**

1. Assess patient for the need for large-bore tube (i.e., for gastric suctioning or lavage).
 - A. Review physician's order for type of tube and enteral feeding schedule.

RATIONALE

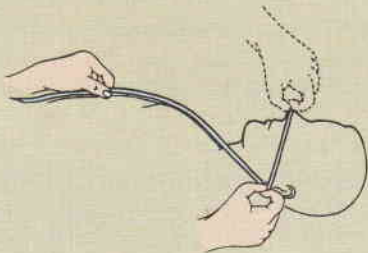
- Identify patients who require gastric drainage or flushing.
- **Procedure and tube feedings require a physician's order.**

► SKILL 42-6 Inserting a Large-Bore Nasoenteric or Orogastric Tube for Gastric Suctioning—cont'd

2. Perform hand hygiene. Assess patency of nares. Have patient close each nostril alternately and breathe. Examine each naris for patency and skin breakdown.
 3. Assess the gag reflex. Place tongue blade in patient's mouth, touching uvula to induce a gag response.
- Nares may be obstructed or irritated, or septal defect may be present.
 - Assessing gag reflex identifies patient's ability to swallow and determines whether a risk for aspiration exists.

Critical Decision Point: Patients with impaired level of consciousness or who are intubated and sedated may also have impaired gag reflex, and their risk of aspiration is increased during this type of procedure and subsequent tube feedings. For a patient who is intubated, sedated, or too ill to participate, ensure that the patient's head is tilted toward the chest for enteral feeding tube insertion.

4. Review patient's medical history for nasal problems (e.g., nosebleeds, oral or facial surgery, anticoagulation therapy, history of aspiration).
 5. Auscultate patient's abdomen for bowel sounds.
 6. Perform hand hygiene (before auscultating abdomen).
 7. Explain procedure to patient and how to communicate during intubation by raising index finger to indicate gagging or discomfort.
 8. Stand on same side of bed as naris for insertion, and assist patient to high Fowler's position unless that position is contraindicated. Place pillow behind patient's head and shoulders.
 9. Place absorbent pad over patient's chest. Keep facial tissues within reach.
 10. Determine length of tube to be inserted, and mark with tape. Traditional method: Measure distance from tip of nose to earlobe to xiphoid process of sternum (see Step 10 illustration).
- Nasoenteral tubes are contraindicated in patients who have undergone recent nasal surgery, have sustained facial traumas, have nosebleeds, or are receiving anticoagulation therapy. Because of risk for improper tube placement, tubes are also contraindicated in patients who have undergone surgical procedures in which a transsphenoid approach was used to remove pituitary tumours (Metheny, 2002).
 - Absence of bowel sounds may indicate decrease in or absence of peristalsis and increased risk for aspiration or abdominal distension.
 - Hygiene reduces transfer of microorganisms.
 - Information reduces anxiety and helps patient assist in insertion. Patients who are alert and communicating tolerate the procedure better than other patients.
 - Fowler's position allows easier manipulation of tube, reduces risk of aspiration, and promotes effective swallowing.
 - Pad prevents soiling of gown. Insertion of tube may cause patient's eyes to tear.
 - Length approximates distance from nose to stomach in 98% of patients. For duodenal or jejunal placement, an additional 20 to 30 cm is required.



Step 10 Length of tube to be inserted is equal to distance from tip of nose to earlobe to xiphoid process.

11. Prepare nasogastric or nasointestinal tube for intubation.
 12. Perform hand hygiene, and put on gloves.
 13. Cut tape 10 cm long or prepare tube fixation device. Split one end of tape lengthwise 5 cm.
 14. Dip tube with surface lubricant into glass of water. If tube is not self-lubricating, then water-soluble lubricant should be used.
 15. Insert tube through nostril to back of throat (posterior nasopharynx). Aim back and down toward ear.
 16. Have patient tilt head toward chest after tube has passed through nasopharynx.
- Hygiene and gloves reduce transmission of microorganisms.
 - To be used to anchor tubing after insertion.
 - Activates lubricant to facilitate passage of tube into nares to gastrointestinal tract. Do not use petroleum-based products due to the risk of aspiration into the lung and a resultant chemical pneumonitis.
 - Natural contour facilitates passage of tube into gastrointestinal tract and reduces gagging by patient.
 - Tilting head forward closes off glottis and reduces risk of tube's entering trachea. This technique is also used in patients who are intubated and sedated.

Critical Decision Point: Encourage patients who are alert and communicating to swallow by giving small sips of water or ice chips when possible. For patients who are intubated and sedated or not able to participate, tilt head toward chest. Advance the tube as patient swallows or as head is tilted toward chest. Rotate tube 180 degrees while inserting.

> SKILL 42-6 Inserting a Large-Bore Nasoenteric or Orogastric Tube for Gastric Suctioning—cont'd

17. Emphasize the need to mouth-breathe and swallow during the procedure (when possible).
 18. When tip of tube reaches the carina (about 25 cm in an adult), stop insertion, hold end of tube near your ear, and listen for air exchange from the distal portion of the tube.
- Mouth-breathing and swallowing facilitate passage of tube and alleviate patient's fears during the procedure.
 - **If air is heard, the tube could be in the respiratory tract; remove tube and start over. This listening step should never be used to verify tube placement** (Metheny, 2006).

Critical Decision Point: Do not force tube insertion. If resistance is met or patient starts to cough, choke, or become cyanotic, stop advancing the tube and pull tube back.

19. Check for position of tube in back of throat with penlight and tongue blade.
 20. Perform measures to verify placement of tube, by measuring pH.
 - A. Examine gastric contents and yield.
- Tube may be coiled, kinked, or entering trachea. (Withdraw tube immediately if tube is coiled, if respiratory status of patient changes, or if patient begins to cough and skin colour changes; if distress is not present, withdraw tube fully and retry. Note whether tube was kinked; if so, it is likely to kink again in the same place.)
 - Note: Tube placement must be verified by X-ray examination before enteral feeds are initiated. Another test that can be done at the bedside to ensure ongoing placement is to measure pH of aspirated gastric fluids.
 - Respiratory and gastric contents may look similar, but aspirating gastric contents yields a greater amount, whereas aspirating respiratory contents may yield only a few millilitres.

Critical Decision Point: Auscultation is no longer considered a reliable method for verification of tube placement because a tube inadvertently placed in the lungs, pharynx, or esophagus can transmit a sound similar to that of air entering the stomach (Metheny, 2006; Richardson et al., 2006; Wagner, 2004).

21. After gastric aspirates are obtained, anchor tube to patient's nose and avoid pressure on nares. Mark exit site on tube with indelible ink. Select one of the following options to secure tube:
 - A. Apply tape
 - (1) Apply tincture of benzoin or other skin adhesive on tip of patient's nose and tube and allow it to become "tacky."
 - (2) Place intact end of tape over bridge of patient's nose. Wrap each of the 5 cm strips around tube as it exits nose.
 - B. Apply tube fixation device, using shaped adhesive patch.
 - (1) Apply wide end of patch to bridge of patient's nose.
 22. Fasten end of nasogastric tube to patient's gown with a piece of tape (not safety pin).
 23. Remove gloves. Perform hand hygiene and apply clean gloves, and administer oral hygiene (see Chapter 37). Cleanse tubing at nostril.
 24. Remove gloves, dispose of equipment, and perform hand hygiene.
 25. Inspect nares and oropharynx for any irritation after insertion.
 26. Ask patient whether he or she feels comfortable.
 27. Observe patient for any difficulty breathing, for coughing, or for gagging.
 28. Auscultate lung sounds.
 29. Connect tube to suction device as ordered.
- A properly secured tube allows the patient more mobility and prevents trauma to nasal mucosa. Mark tube at tip of nares; measure from line to end of tube; tape and secure to maintain position.
 - Skin adhesive helps tape adhere better and protects skin.
 - Securing tape to nares prevents tissue necrosis.
 - Device secures tube and reduces friction on nares.
 - Fastening tape to gown reduces traction on the nares if tube moves. Tape is recommended because safety pins may become unfastened and possibly cause injury to the patient.
 - Oral hygiene promotes patient comfort and integrity of oral mucous membranes.
 - Hygiene reduces transmission of microorganisms.
 - If tube insertion was difficult, irritation of nares or oropharynx may have occurred.
 - Patients' level of comfort is evaluated. (This may be a challenge if a language barrier exists or if the patient has dementia or is confused.)
 - Improper position of the tube may cause these symptoms or increase symptoms in patients who have heart failure, pneumonia, asthma, and other cardiac or respiratory conditions.
 - Abnormal lung sounds can be an early sign of aspiration.
 - May be ordered as a continuous or intermittent suction and at various pressures (e.g., 80 mm Hg). In some circumstances, tubes are placed by surgeon but contraindicated or strict protocols for flush or suction (i.e., post esophagectomy).

Medication

It is recommended that medications *not* be administered via large-bore tube while suctioning is required. If a large-bore tube must be used, then suctioning should be withheld for at least 30 minutes after medication is administered. Consult with pharmacist and refer to institutional or agency policy.

Parenteral Nutrition

Parenteral nutrition is a form of specialized nutrition support in which nutrients are provided intravenously. Safe administration of this form of nutrition depends on appropriate assessment of nutrition needs, meticulous management of the central venous catheter (CVC) or central venous access device (CVAD), and careful monitoring to prevent or treat metabolic complications. Parenteral nutrition is administered in a variety of settings, including the patient's home. Regardless of the setting, the nurse adheres to the same principles of asepsis and infusion management to ensure safe nutrition support.

Patients who are unable to digest or absorb enteral nutrition benefit from parenteral nutrition. Patients in highly stressed physiological states, such as sepsis, head injury, or burns, are also candidates for parenteral nutrition therapy. Box 42-18 lists other indications for parenteral nutrition. Clinical and laboratory monitoring by a multidisciplinary team is required throughout parenteral nutrition therapy. The need for continued parenteral nutrition is re-evaluated regularly, with the goal of eventually using the gastrointestinal tract. Disuse of the gastrointestinal tract has been associated with villus atrophy and generalized cell shrinkage. Translocation of bacteria from the local gut to systemic regions has been noted in relation to gastrointestinal cell shrinkage; such translocation can result in gram-negative septicemia.

Lipid emulsions provide supplemental kilocalories and prevent deficiencies of essential fatty acids. These emulsions can be administered through a separate peripheral catheter, through the CVC by Y-connector tubing (see Chapter 39), or

as an admixture to the parenteral nutrition solution. The addition of lipid emulsion to the parenteral nutrition solution is called a *3-in-1 admixture* and is administered over a 24-hour period. The admixture should not be used if oil droplets are observed or if an oil or creamy layer is observed on the surface of the admixture. This observation indicates that the emulsion has broken into large lipid droplets that can cause fat emboli if administered. Lipid emulsions are white and opaque; thus, care should be taken to avoid confusing enteral formula with parenteral lipids.

Contraindications to giving lipids are hyperlipidemia, lipid nephrosis, severe liver failure, and egg allergy (patient should be asked about egg allergy during history taking).

Initiating Parenteral Nutrition

Patients with short-term nutritional needs often receive intravenous solutions of less than 10% dextrose in a peripheral vein in combination with amino acids and lipids. Peripheral solutions are not as calorically dense and therefore are less irritating to the peripheral veins, and their use is usually temporary. Administering parenteral nutrition with greater than 10% dextrose requires a CVC (Figure 42-12) that is placed into a high-flow central vein (such as the superior vena cava) by a physician using sterile technique (see Chapter 39).

Nurses who have special training insert peripherally inserted central catheters (PICCs) that are started in a vein of the forearm or upper arm and threaded into the subclavian vein or the superior vena cava (Figure 42-13).

After central catheter or PICC placement is verified by chest X-ray examination or radiographically confirmed and documented, the catheter is flushed with saline or heparin. The physician may suture the CV catheter in place. A PICC is usually stabilized with sterile strips of tape and a sterile dressing. The types of dressings to be applied vary between institutions and a variety of policies and protocols are adhered to. The nurse who is new to the nursing unit can check the appropriate dressing protocol and policy before proceeding. Wing-to-tip of the PICC should be measured and documented daily. With a tube suspected to be migrating 2 cm or more, all fluids should be stopped and radiography should be repeated for

► BOX 42-18

Indications for Parenteral Nutrition

Nonfunctional Gastrointestinal Tract

- Massive small bowel resection or gastrointestinal surgery
- Paralytic ileus
- Intestinal obstruction
- Trauma to abdomen, head, or neck
- Severe malabsorption
- Intolerance of enteral feeding (established by trial)
- Chemotherapy, radiation therapy, bone marrow transplantation

Extended Bowel Rest

- Enterocutaneous fistula
- Inflammatory bowel disease exacerbation
- Severe diarrhea
- Moderate to severe pancreatitis

Preoperative Total Parenteral Nutrition

- Preoperative bowel rest
- Treatment for comorbid severe malnutrition in patients with nonfunctional gastrointestinal tracts
- Severely catabolic patients when gastrointestinal tract is nonusable for more than four to seven days

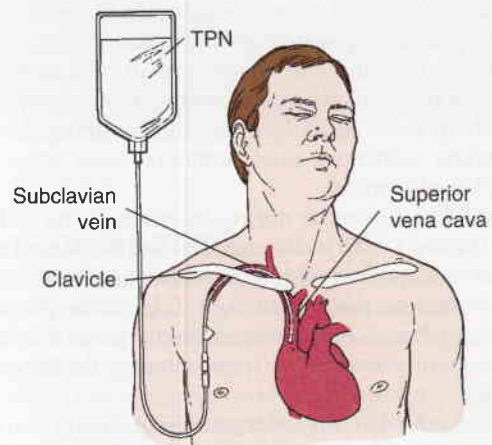


Figure 42-12 Parenteral Nutrition via CVC. **Source:** Mosby's dictionary of medicine, nursing, and health professionals (8th edition), 2009. St Louis, MO: Mosby.

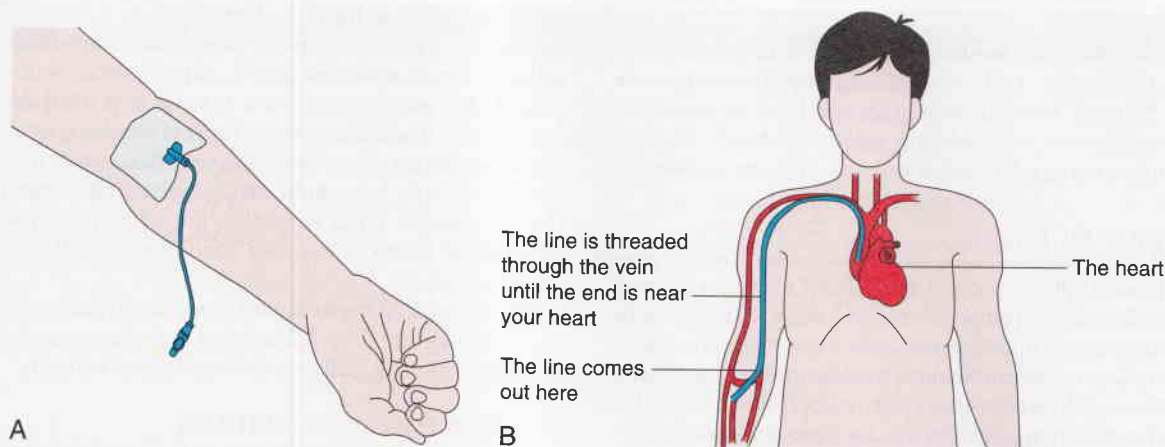


Figure 42-13 PICC line insertion.

placement verification. Also to verify placement, the PICC line may be flushed by specially trained nurses and if noted to be occluded, special procedures (e.g., alteplase) are carried out to ensure line patency.

Before beginning any parenteral infusion, the nurse verifies the physician's order and inspects the solution for particulate matter or a break in the lipid emulsion. An infusion pump is always used. An initial rate of 40 to 60 mL/hour may be recommended. In some institutions, the solutions are infused separately at a specified rate until the therapy is no longer required. In this instance, each solution would have a separate infusion pump. Parenteral nutrition in the hospital is infused 24 hours a day. The parenteral infusion is refrigerated until needed, while the lipids are stored at room temperature.

The rate is gradually increased until the patient's complete nutrition needs are supplied. Patients who receive parenteral nutrition at home frequently administer the entire daily solution over 12 hours at night. This allows the patient to disconnect from the infusion each morning, flush the central catheter, and have independent mobility during the day.

Preventing Complications

Complications of parenteral nutrition include mechanical complications from insertion of the CVC, infection, and metabolic alterations (Table 42-9). Pneumothorax occurs when a puncture in the pulmonary system results in accumulation of air in the pleural cavity and subsequent impairment in breathing. Pneumothorax is usually accompanied by symptoms of sudden sharp chest pain, dyspnea, and coughing. In relation to parenteral nutrition, pneumothorax most often occurs during CVC placement.

Air embolus can occur during insertion of the catheter or when the tubing or cap is changed. Having the patient perform a Valsalva manoeuvre (holding his or her breath and "bearing down") while assuming a left lateral decubitus position can prevent air embolus. The increased venous pressure created by the manoeuvre prevents air from entering the bloodstream during catheter insertion.

To avoid infection, the infusion tubing should be changed regularly. A filtered tubing is required, and most institutions require the tubing be changed every 24 hours. During central catheter dressing changes, sterile mask and gloves are always used, and insertion sites assessed for signs and symptoms of infection (see Chapter 32).

Electrolyte abnormalities should be corrected before starting parenteral nutrition. Calorie goals should be reached gradually. It is very important to base the caloric and protein needs on the patient's current weight to avoid overfeeding. The parenteral nutrition solution contains most of the major electrolytes, vitamins, and minerals. Potassium, magnesium, and phosphorous levels should be closely monitored, as well as intake and output during the first week of parenteral therapy. Supplemental vitamin K must be given as ordered throughout therapy. Vitamin K can be synthesized by microflora found in the jejunum and ileum with normal use of the gastrointestinal tract; however, because parenteral nutrition circumvents gastrointestinal use, exogenous vitamin K must be administered.

Electrolyte and mineral imbalances may occur. Ingestion of concentrated glucose is accompanied by increases in endogenous insulin production, which causes cations (potassium, magnesium, and phosphorus) to move intracellularly. In malnourished or cachectic patients, the resulting low serum (extracellular) levels of electrolytes and edema may cause cardiac dysrhythmias, heart failure, respiratory distress, convulsions, coma, or death. This has been called *refeeding syndrome*.

Too-rapid administration of hypertonic dextrose can result in an osmotic diuresis and dehydration (see Chapter 39). Thus, if an infusion falls behind schedule, the nurse should not increase the rate in an attempt to catch up. Sudden discontinuation of the solution can cause hypoglycemia. Usually, 10% dextrose is infused when parenteral nutrition solution is suddenly discontinued. Patients with diabetes are especially at risk for this development.

Repeated or traumatic catheter insertions place patients at risk for central vein thrombosis. Prevention of catheter-related thromboses includes proper positioning of the catheter and prevention of infections. Although flushes with thrombolytic agents such as heparin might prevent catheter-related thromboses, confirmatory research and cost-effectiveness analysis of this approach are needed before it is recommended (Baskin et al., 2009).

The goal is for patients to switch from parenteral nutrition to enteral nutrition or oral feeding, or both. Specified weights and intakes are recorded. Once patients are meeting one-third to one-half of their kilocalorie needs per day, parenteral nutrition is usually decreased to half the original volume. Enteral nutrition feedings should then be increased to meet needs. When 75% of daily energy needs are consistently met with

► TABLE 42-9 Complications of Parenteral Nutrition (PN)

Problem	Signs and Symptoms	Intervention
Air embolism	Tachypnea, apnea, wheezing, hypotension, cyanosis	Turn patient to left lateral decubitus position, instruct patient to perform Valsalva manoeuvre, and lower head of bed. Cap the open end of catheter or tape perforation in catheter wall. Administer oxygen; notify physician. Maintain integrity of closed system to prevent air emboli, and have patient perform Valsalva manoeuvre when cap is changed.
Catheter occlusion	No flow or sluggish flow through the catheter	Temporarily stop infusion and flush with saline or heparin. If effort to flush is unsuccessful, attempt to aspirate clot; if still unsuccessful, follow protocol for use of thrombolytic agent (e.g., alteplase). Alteplase has been shown to be effective in restoring catheter patency.
Catheter sepsis	Fever, chills, glucose intolerance, positive blood culture	To prevent, change catheter site dressing if it becomes wet or contaminated, use aseptic technique when changing dressing or when handling IV tubing, catheter caps, or parenteral nutrition containers. Do not hang a single container of parenteral nutrition for more than 24 hours or a container of lipids more than 12 hours; use an inline 0.22 mcg filter to remove bacteria.*
Electrolyte imbalance	Monitor Na, Ca, K, Cl, PO ₄ , Mg, and CO ₂ levels	See Chapter 39 for signs of deficiency or toxicity. Check total parenteral nutrition (TPN) for supplemental electrolyte levels at regular intervals—often weekly. Notify physician of imbalances.
Hypercapnia	Increased oxygen consumption, increased CO ₂ , respiratory quotient >1.0, minute ventilation	Ventilator-dependent patients are at risk; to prevent, monitor parameters, provide 30% to 60% of energy requirements as fat per physician's order.
Hypoglycemia	Diaphoresis, shakiness, confusion, loss of consciousness	To prevent, do not discontinue PN abruptly but taper rate down to within 10% of infusion rate one to two hours before stopping. If hypoglycemia is suspected, test blood glucose level, and administer IV bolus of dextrose per physician order if necessary.
Hyperglycemia	Thirst, headache, lethargy, increased urination	Monitor blood glucose level daily until it is stable and then as ordered or as needed. PN is initiated slowly and tapered up to maximal infusion rate. Additional insulin may be required during therapy if problem persists (or if patient has diabetes mellitus).
Hyperglycemic hyperosmolar nonketonic dehydration or coma	Hyperglycemia (>500 mg/dL), glycosuria, serum osmolality >350 mOsm/L, confusion, azotemia, headache, severe signs of dehydration (see Chapter 39), hypernatremia, metabolic acidosis, convulsions, coma	To prevent, monitor blood glucose, blood urea nitrogen, serum osmolality, glucose in urine, and fluid losses; administer insulin as ordered; replace fluids as needed; maintain consistent infusion rate; and provide 30% of daily energy needs as fat. Patients at risk are those who are hypermetabolic, those receiving steroids, older adults, diabetic patients, those who have impaired renal or pancreatic function, and those who are septic.
Pneumothorax	Severe dyspnea, cyanosis, radiographic confirmation	Complication that occurs upon catheter insertion may evolve slowly afterward. Monitor patient for first 24 hours for pulmonary distress.
Thrombosis of central vein	Unilateral edema of neck, shoulder, and arm; pain	Notify physician.

*With 3-in-1 admixture TPN, filtration is not possible because of large lipid molecules.

tube feeding, parenteral nutrition may be discontinued. Patients who make the transition from parenteral nutrition to oral feedings typically have early satiety and decreased appetite. Calorie and protein counts are recommended when patients begin taking soft foods. Parenteral nutrition should be gradually decreased in response to increased oral intake. If oral intake is inadequate, small, frequent meals may prove helpful. When 75% of needs are being met by reliable dietary intake or intake analysis, parenteral nutrition therapy may be discontinued. Some institutions will discontinue lipid emulsion first, then parenteral infusion is continued until requirements are met.

✦ KEY CONCEPTS

- Nurses must have current, culturally sensitive nutritional knowledge to apply to the complexities of health care and illness and to the changing needs of diverse populations and demographics.
- A balanced diet featuring carbohydrates, fats, proteins, vitamins, and minerals provides the essential nutrients to carry out the body's normal physiological functioning throughout the lifespan.
- Through digestion, food is broken down into its simplest form for absorption. Digestion and absorption occur mainly in the small intestine.

- Dietary reference intakes (DRIs) provide a range of values that address the needs of groups (estimated average requirement) and individuals (adequate intakes, recommended dietary allowances, and tolerable upper intake level).
 - Guidelines for dietary change advocate reduced saturated and trans fat, reduced sodium, and reduced refined sugars, as well as an increased intake of complex carbohydrates and fibre.
 - Nutritional screening helps to identify patients at risk of malnourishment. Because improper nutrition can affect all body systems, nutritional assessment includes total physical assessment.
 - Interdisciplinary collaboration is essential to helping a patient achieve optimal nutrition.
 - Special diets alter the composition, texture, digestibility, and residue of foods to suit the patient's particular needs.
2. Essential nutrients
 1. Are made by the body
 2. Generally must be supplied by food
 3. Include alcohol
 4. Are enzymes
 3. Positive nitrogen balance would occur in
 1. Infection
 2. Starvation
 3. Burn injury
 4. Pregnancy
 4. The major determinant of healthy eating is
 1. Educational level
 2. Income
 3. Food preferences
 4. Vitamin supplementation

✦ CRITICAL THINKING EXERCISES

1. Charlene MacDonald, a 63-year-old accountant, is overweight with a sedentary lifestyle, uses alcohol infrequently, consumes restaurant food for most meals, and takes 400 IU of vitamin D daily. She wants to undergo cataract surgery to improve her vision; however, the surgeon has advised her to take off at least 10 kg of weight before the operation. Ms. MacDonald weighs 90 kg and has a height of 156 cm. Her waist circumference is 100 cm. What indications would lead you to believe Ms. MacDonald is adequately caring for her health? What additional laboratory tests and dietary and health history information are needed to perform a comprehensive nutritional assessment? What conclusions can you draw from the information available about Ms. MacDonald's weight status? Using *Eating Well With Canada's Food Guide*, what suggestions would you make to Ms. MacDonald to help her achieve weight loss?
2. Corey Green, a 32-year-old mother, is considering switching her entire family to a vegan diet because she believes it will make her 3-year-old twin daughters healthier. What nutritional concerns should you watch for? How would you assess the family's nutritional needs and monitor for such concerns? What advice would you offer to Corey to enhance her family's health while following a vegan diet? Plan one day of meals for this family, indicating food servings for the twins that would meet their protein needs and respect the vegan food diet.
3. Daniele, a middle-school student, is unhappy with her shape and weight. Using an Internet site, she calculated her BMI as 29 one month ago. "I am the smallest person in my family, but I am too fat!" she thought. During the past four months, she has skipped breakfast and lunch and exercised for two hours a day to "tone up." Her skin, lips, and hair are becoming dry. Daniele denies having lost weight even though her clothes look loose and baggy. Her friends told the homeroom teacher that Daniele goes to the bathroom immediately after eating any food. The teacher requests that you plan a session with Daniele to increase her understanding of her daily nutritional requirements and of healthy eating patterns. What will you discuss with Daniele?
4. Older adults at risk for malnutrition
 1. Have the security of living on a fixed income
 2. Know about the amounts of fat, sodium, and cholesterol in the foods they eat
 3. Experience age-related gastrointestinal changes such as reduced saliva production, increased taste threshold, and decreased peristalsis
 4. Have diseases such as diabetes and depression well controlled
5. When a patient is unable to take fluid or food by eating normally over an extended period of time, which of the following is the best alternative?
 1. Liquid nutrients through a tube leading from the nose to the stomach or intestine
 2. Giving solutions through a tubing in a peripheral vein
 3. Giving continuous tube feedings regulated via an electric feeding pump
 4. Giving feedings through a tube inserted through the skin and tissue of the abdomen
6. A nutrient content claim of *light* means
 1. The food may be light in colour
 2. The food has no added sugar or salt
 3. The food is reduced in calories or fat by 10%
 4. The levels of saturated and trans fatty acids are restricted
7. When a mother tells you that she would like to switch her 15-month-old toddler from whole to skim milk so the child will not get "too fat," you encourage her to continue with the whole milk because
 1. Whole milk has more calcium than skim
 2. Whole milk has a longer refrigerated storage life
 3. Whole milk costs the same as skim milk
 4. Whole milk contains fatty acids needed for the toddler's brain development
8. Which of the following interventions is appropriate for the patient experiencing dysphagia?
 1. Encourage the patient to rest lying down for at least 30 minutes after a meal
 2. Offer thin liquids to make swallowing easier
 3. Place the food on the strong side of the patient's mouth
 4. Leave the patient with all food items within easy reach and tell the patient when you will come back to take away the tray

✦ REVIEW QUESTIONS

1. A function of carbohydrates in the diet is to
 1. Enable chemical reactions
 2. Promote growth and repair of tissues
 3. Supply energy
 4. Maintain water balance

10. The nursing activity *most* likely to prevent the clogging of a nasogastric feeding tube is
 1. Attaching the tubing to suction after each feeding
 2. Filling the tube with water and clamping it after each feeding
 3. Clamping the tube before all of the nourishment has drained
 4. Giving the patient ice chips to suck after each feeding

❖ RECOMMENDED WEB SITES

Health Canada Food and Nutrition: <http://www.hc-sc.gc.ca/fn-an/index-eng.php>

This Web page provides information for the public about food, nutrition, food safety issues, allergy alerts, food policy and legislation, and other nutrition issues.

Health Canada: Eating Well with Canada's Food Guide: <http://www.hc-sc.gc.ca/fn-an/food-guide-aliment/index-eng.php>

This Web page provides information about using and ordering *Eating Well with Canada's Food Guide*, now available in 10 languages other than English: Arabic, Chinese, Farsi (Persian), Korean, Punjabi, Russian, Spanish, Tagalog, Tamil, and Urdu.

Office of Nutrition Policy and Promotion (ONPP): <http://www.hc-sc.gc.ca/ahc-asc/branch-dirgen/hpfb-dgpsa/onpp-bppn/index-eng.php>

The ONPP promotes the nutritional health and well-being of Canadians. This Web page contains current information about nutrition and Canadian nutrition policy.

Ontario Public Health Association (OPHA): <http://www.opha.on.ca/programs/nrc.shtml>

The Ontario Public Health Association has created the Nutrition Resource Centre, which provides support and resources to support healthy eating.

Dietitians of Canada: <http://www.dietitians.ca/>

Dietitians of Canada is an association of food and nutrition professionals committed to the health and well-being of Canadians. This Web page contains numerous resources about nutrition and links to other resources and research abstracts.

National Eating Disorder Information Centre: <http://www.nedic.ca>

This Web site provides information, resources, and support for individuals, families, and professionals regarding eating disorders and weight preoccupation.

National Heart, Lung, and Blood Institute: The DASH Eating Plan: <http://www.nhlbi.nih.gov/health/public/heart/hbp/dash/>

The Dietary Approaches to Stop Hypertension (DASH) is an eating plan low in total fat, saturated fat, and cholesterol, and rich in fruits, vegetables, and low-fat dairy products. The DASH eating plan is developed for patients with hypertension and is based on clinical studies that showed how elevated blood pressure levels can be reduced with specific eating habits.

Review Question Answers

1. 3, 2, 2, 3, 4, 4, 2, 5, 1, 6, 4, 7, 4, 8, 3, 9, 3, 10, 2

Rationales for the Review Questions appear at the end of the book.

Urinary Elimination

Original chapter by Terry L. Wood, RN, CNE, PhD

Canadian content written by Kathleen F. Hunter, RN, NP, PhD, GNC(C), NCA

objectives

Mastery of content in this chapter will enable you to:

- Define the key terms listed.
- Describe the process of urination.
- Identify factors that commonly influence urinary elimination.
- Compare common alterations in urinary elimination.
- Identify two modalities of renal replacement therapy.
- Obtain a nursing health history for a patient with urinary elimination problems.
- Identify nursing diagnoses appropriate for patients with alterations in urinary elimination.
- Obtain urine specimens.
- Describe characteristics of normal and abnormal urine.
- Describe the nursing implications of common diagnostic tests of the urinary system.
- Discuss nursing measures to promote normal micturition and to reduce episodes of incontinence.
- Insert a urinary catheter.
- Discuss nursing measures to reduce urinary tract infection.
- Irrigate a urinary catheter.

key terms

- Anuria, p. 1115
- Bacteriuria, p. 1117
- Bladder neck, p. 1115
- Catheterization, p. 1136
- Cystitis, p. 1117
- Detrusor muscle, p. 1115
- Diuresis, p. 1116
- Diurnal polyuria, p. 1118
- Dysuria, p. 1117
- Encrustation, p. 1146
- Erythropoietin, p. 1113
- Functional incontinence, p. 1118
- Habit retraining, p. 1155
- Hematuria, p. 1117
- Hemodialysis, p. 1116
- Incontinence, p. 1117
- Kegel exercises, p. 1155
- Ketonuria, p. 1128
- Micturition, p. 1114
- Mixed incontinence, p. 1118
- Nephron, p. 1113
- Nephrostomy, p. 1119
- Nocturia, p. 1118
- Nocturnal polyuria, p. 1118
- Oliguria, p. 1115
- Overactive bladder syndrome (OAB), p. 1118
- Overflow incontinence, p. 1118
- Pelvic floor muscle exercises (PFMEs), p. 1155
- Peritoneal dialysis, p. 1115
- Polyuria, p. 1116
- Pontine micturition centre, p. 1115
- Prompted voiding, p. 1155
- Prostate gland, p. 1115
- Prostatic hypertrophy, p. 1117
- Proteinuria, p. 1113
- Pyelonephritis, p. 1117
- Reflex incontinence, p. 1118
- Renal calculus, p. 1114
- Renal pelvis, p. 1114
- Renal replacement therapies, p. 1115
- Renin, p. 1113
- Residual urine, p. 1117
- Rhabdosphincter, p. 1115
- Specific gravity, p. 1127
- Stress incontinence, p. 1118
- Stoma, p. 1116
- Suprapubic catheterization, p. 1152
- Total incontinence, p. 1118
- Transient incontinence, p. 1117
- Trigone, p. 1115
- Uremic syndrome, p. 1115
- Ureterostomy, p. 1119
- Urethral closure mechanism, p. 1115
- Urethral meatus, p. 1115
- Urethral stricture, p. 1118
- Urge incontinence, p. 1118
- Urinalysis, p. 1124
- Urinary diary, p. 1121
- Urinary diversion, p. 1116
- Urinary frequency, p. 1118
- Urinary incontinence (UI), p. 1117
- Urinary retention, p. 1118
- Urosepsis, p. 1117

media resources

evolve WEBSITE

<http://evolve.elsevier.com/Canada/Potter/fundamentals/>

- Audio Chapter Summaries
- Examination Review Questions
- Glossary
- Skills Performance Checklists
- Student Learning Activities
- Video Clips
- Weblinks

Normal elimination of urinary wastes is a basic function that most people take for granted. When the urinary system fails to function properly, virtually all organ systems will be affected eventually. Patients with alterations in urinary elimination also may suffer emotionally from changes in body image. It is important that you be understanding and sensitive to all of your patients' needs. Understanding the reasons for urinary elimination problems and finding acceptable solutions are essential nursing functions.

Scientific Knowledge Base

Urinary elimination depends on the functioning of the kidneys, ureters, bladder, and urethra. Kidneys remove wastes from the blood to form urine. Ureters transport urine from the kidneys to the bladder. The bladder stores urine until the urge to urinate develops. Urine then leaves the body through the urethra. All organs of the urinary system must be intact and functional for successful removal of urinary waste (Figure 43-1).

Upper Urinary Tract

Kidneys. The kidneys lie on either side of the vertebral column behind the peritoneum and against deep muscles of the back. The kidneys extend from the twelfth thoracic vertebra to the third lumbar vertebra. Normally, the left kidney is higher than the right one because of the anatomical position of the liver.

Waste products of metabolism that collect in the blood are filtered in the kidneys. Blood reaches each kidney by a renal (kidney) artery that branches from the abdominal aorta. Approximately 20% to 25% of the cardiac output circulates each minute through the kidneys. The nephron, the functional unit of the kidney, forms the urine. The **nephron** is composed of the glomerulus, Bowman's capsule, proximal convoluted tubule, loop of Henle, distal tubule, and collecting duct (Figure 43-2). Each kidney contains approximately 1 million nephrons (Sherwood, 2007).

A cluster of blood vessels forms the capillary network of the glomerulus, which is the initial site of filtration of the blood

and the beginning of urine formation. The glomerular capillaries permit filtration of water, glucose, amino acids, urea, creatinine, and major electrolytes into Bowman's capsule. Large proteins and blood cells normally do not filter through the glomerulus. The presence of large proteins in urine (**proteinuria**) is a sign of glomerular injury.

The glomerulus filters approximately 125 millilitres of plasma per minute (180 litres per day). Most (99%) of the filtrate is reabsorbed into the plasma, with the remaining 1% excreted as urine (Sherwood, 2007). The kidneys play a key role in fluid and electrolyte balance (see Chapter 39). Although output does depend on intake, normal adult urine output is 1500 to 1600 mL/day. An output of less than 30 mL/hour may indicate renal alterations.

The kidneys produce several substances vital to the production of red blood cells (RBCs), blood pressure regulation, and bone mineralization. The kidneys are responsible for maintaining a normal RBC volume by producing **erythropoietin**, a hormone that functions within the bone marrow to stimulate RBC production and maturation and that prolongs the life of mature RBCs (Sherwood, 2007). Patients with chronic alterations in kidney function cannot produce sufficient quantities of this hormone and are therefore prone to anemia.

Renin is another hormone produced by the kidneys. Its major role is the regulation of blood flow in times of renal ischemia (decreased blood supply). Renin is released from the juxtaglomerular cells (Figure 43-3) and functions as an enzyme to convert angiotensinogen (a substance synthesized by the liver) into angiotensin I. Angiotensin I is converted to angiotensin II in the lungs. Angiotensin II causes vasoconstriction and stimulates aldosterone release from the adrenal cortex. Aldosterone causes retention of water, which increases blood

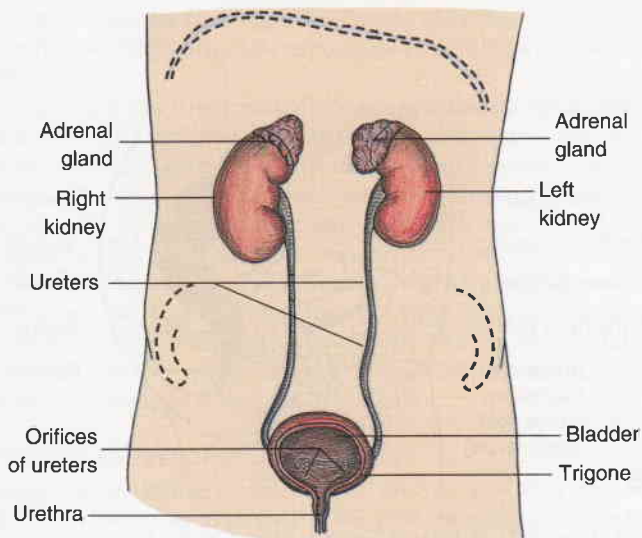


Figure 43-1 Organs of the urinary system.

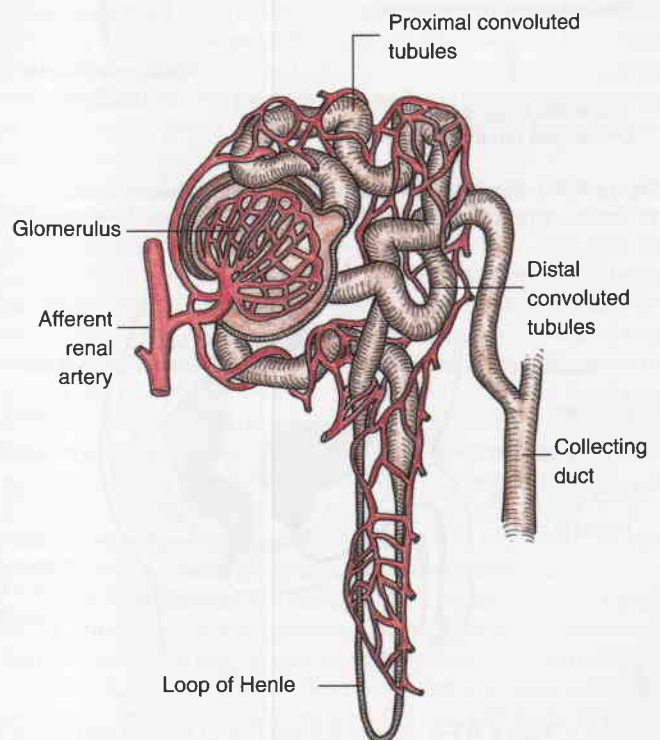


Figure 43-2 Renal nephron.

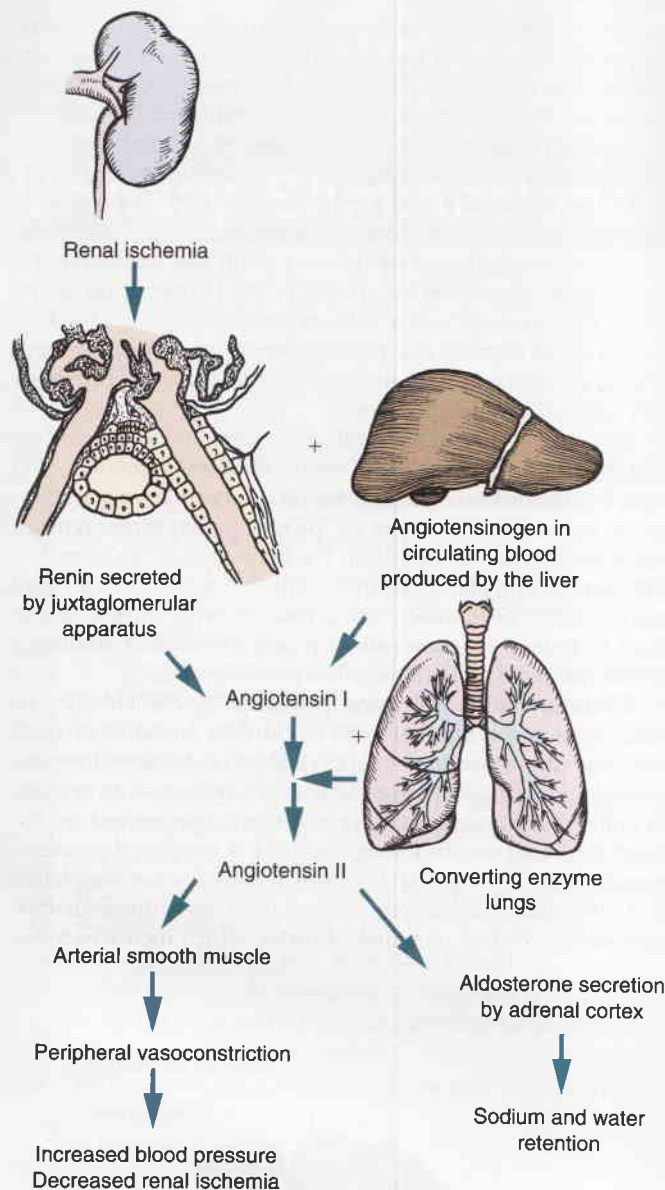


Figure 43-3 Physiological effects of renin-angiotensin mechanism.

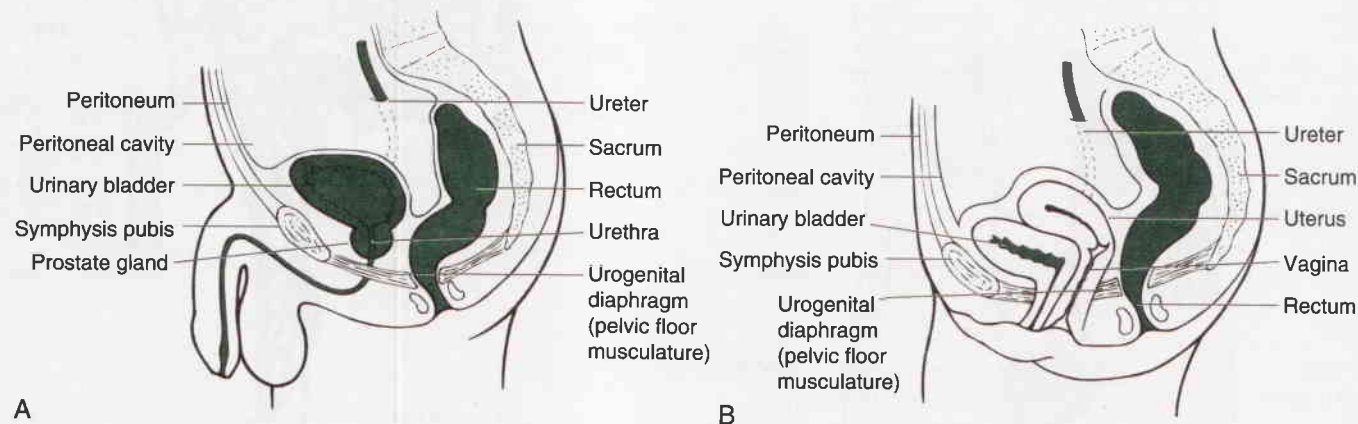


Figure 43-4 Anatomical location of bladder and pelvic organs. **A**, In men. **B**, In women. **Source:** From Getliffe, K., & Dolman, M. (2007). Assessing bladder function. In K. Getliffe & M. Dolman (Eds.), *Promoting continence* (3rd ed., pp. 25–53). London: Bailliere-Tindall.

volume. Both of these mechanisms increase arterial blood pressure and renal blood flow (Sherwood, 2007). The kidneys also produce prostaglandin E2 and prostacyclin, which are important in maintaining renal blood flow through vasodilation.

The kidneys play a role in calcium and phosphate regulation by producing a substance that converts vitamin D into its active form. Patients with chronic alterations in kidney function do not make sufficient amounts of active vitamin D. They are prone to develop renal bone disease resulting from the demineralization of bone caused by impaired calcium absorption.

Ureters. Urine enters the **renal pelvis** from the collecting ducts and travels to the bladder through the ureters. The ureters are tubular structures that enter the urinary bladder obliquely through the posterior wall, at the ureterovesical junction (the juncture of the ureters and the bladder). This arrangement normally results in compression of the ureter at the junction during **micturition** (urination) to prevent the reflux of urine.

Peristaltic waves cause urine to enter the bladder in spurts rather than steadily. An obstruction within a ureter, such as a kidney stone (**renal calculus**), results in strong peristaltic waves that attempt to move the obstruction into the bladder. These strong peristaltic waves often result in pain known as **renal colic**.

Lower Urinary Tract

Bladder. The urinary bladder is a hollow, distensible muscular organ that stores and excretes urine. When empty, the bladder lies behind the symphysis pubis in the pelvic cavity. It rests against the anterior wall of the rectum in men and against the anterior walls of the cervix and vagina in women (Figure 43-4).

The bladder expands as it becomes filled with urine. Pressure increases only minimally during bladder filling because the relaxed bladder is normally highly compliant (Fry et al., 2005). When the bladder is full, it expands and extends above the symphysis pubis. A very distended bladder may reach the umbilicus. In a pregnant woman, the developing fetus pushes against the bladder, reducing its capacity and causing a feeling of fullness. This effect is more likely to occur in the first and third trimesters.

The main muscle of the bladder is the **detrusor muscle**. Contraction of the detrusor expels urine from the body. The **trigone** is a triangular area of smooth muscle at the base of the bladder. An opening exists at each of the trigone's three angles, two for the ureters and one for the urethra.

Urethra. Urine travels from the bladder through the urethra (a fibromuscular tube) and passes outside of the body through the **urethral meatus**. In women, the urethra is approximately 4 cm long. This short length predisposes women and girls to infection. The male urethra is about 20 cm long and serves as both a urinary canal and a passageway for cells and secretions from reproductive organs. The male urethra has three sections: the prostatic urethra, the membranous urethra, and the penile urethra. The prostatic urethra pierces the anterior portion of the **prostate gland** (see Figure 43-4, A).

The ability of the urethra to maintain adequate closure pressure between voids is critical to retaining urine in the bladder (Ashton-Miller & DeLancey, 2007), particularly because intra-abdominal pressure increases during coughing, lifting, laughing, and sneezing. This task is accomplished through a combination of factors known collectively as the **urethral closure mechanism**. Detrusor muscle surrounds the urethra at the level of the **bladder neck**, helping to constrict the opening. Circular smooth muscle as well as striated sphincter muscle (also known as the external sphincter, or **rhabdosphincter**) comprise the proximal two-thirds of the urethra and play an important role in sustaining tone. In addition, a highly vascular mucosal surface helps to maintain a watertight seal (Ashton-Miller & DeLancey, 2007). The striated musculature of the pelvic floor surrounds the urethra and provides additional closure pressure. Finally, increases in intra-abdominal pressure, such as those that occur during coughing and sneezing, are normally transmitted to the bladder neck, enhancing closure of the proximal urethra during stress (Griffiths et al., 2005).

Act of Urination

The act of urination relies on the coordinated effort of the bladder and the urethral closure mechanism. The adult bladder normally holds approximately 500 mL of urine and empties, on average, five to seven times per day. As the bladder becomes distended and as it is deemed appropriate to urinate, the detrusor (bladder muscle) contracts and the urethral sphincter mechanism relaxes to allow expulsion of urine (Morrison et al., 2005).

Several brain structures influence urination. As the bladder fills, sensory impulses are sent to the sacral spinal cord and relayed to the **pontine micturition centre**. If a person is ready to void, the pontine micturition centre relays the impulses back to initiate detrusor contraction, sphincter relaxation, and bladder emptying. If a person chooses not to void, the impulses are relayed to the cerebral cortex for voluntary inhibition of a detrusor contraction. If the urge to void has been ignored repeatedly, bladder capacity may be reached and the resulting pressure on the sphincter may make continued voluntary control impossible (Morrison et al., 2005).

Factors Influencing Urination

Many factors influence the volume and quality of urine and the patient's ability to urinate. Some pathophysiological conditions may be acute and reversible (urinary tract infection), whereas others may be chronic and irreversible (slow, progressive development of renal dysfunction).

Disease Conditions. The complex role that the nervous system plays in urinary elimination suggests that any disruption to the central or peripheral pathways can affect urination. Between 40% and 60% of individuals admitted to hospital after a cerebrovascular accident experience urinary incontinence, and 15% remain incontinent one year later (Thomas et al., 2008). Between 30% and 50% of patients with multiple sclerosis experience urgency, frequency, and urge incontinence, which can be complicated by urinary retention if the urethral sphincter fails to relax as the bladder contracts (Wyndaele et al., 2005). Deficiencies in neurotransmission that occur with Parkinson's disease can lead to overactive bladder symptoms or to a hypocontractile bladder. Conditions affecting the peripheral nervous system, such as diabetes mellitus, generally cause impaired bladder contractility, reduced sensation of bladder fullness, and incomplete emptying (Wyndaele et al., 2005).

Patients with cognitive impairment, such as Alzheimer's disease, may lose the ability to sense a full bladder or may be unable to recall the procedure for voiding (Dubeau et al., 2009). Diseases or conditions that slow or hinder mobility also interfere with the physical act of micturition. A patient with rheumatoid arthritis, for example, may be unable to sit on or rise from a toilet without an elevated toilet seat.

Conditions that affect the volume or quality of the urine are generally categorized as prerenal, renal, or postrenal in origin. Prerenal alterations such as dehydration, hemorrhage, and heart failure decrease circulating blood flow to and through the kidneys and can lead to **oliguria** (diminished capacity to form urine) or, less commonly, **anuria** (inability to produce urine). Renal alterations result from conditions such as diabetes mellitus that cause injury directly to the glomeruli or renal tubule, interfering with their normal filtering, reabsorptive, and secretory functions. Postrenal alterations result from obstruction to the flow of urine in the urinary collecting system anywhere between the renal pelvis and the urethral meatus. Urine is formed by the urinary system but cannot be eliminated by normal means. Obstructive symptoms in the male lower urinary tract, such as hesitancy, intermittent stream, and straining to void, are frequently associated with enlargement of the prostate gland caused by benign prostatic hyperplasia or prostate cancer.

Diseases and conditions that cause irreversible damage to the glomeruli or renal tubules cause permanent alterations in renal function. The resulting decline in kidney function is called end stage renal disease, and the patient manifests numerous metabolic disturbances that necessitate treatment for survival. The associated symptoms occur as a result of the **uremic syndrome**, characterized by an increase in nitrogenous wastes in the blood, altered regulatory functions (causing marked fluid and electrolyte abnormalities), nausea, vomiting, headache, coma, and convulsions. The problem may be managed conservatively with medications and a regimen of dietary and fluid restrictions. However, as the uremic symptoms worsen, more aggressive treatment is indicated. These treatments are known as **renal replacement therapies**.

Renal Replacement Therapies. Dialysis (Box 43-1) and organ transplantation are two methods of renal replacement. Dialysis may take one of two forms: peritoneal or hemodialysis. Both dialysis modalities can be applied for a short or long time, but specialized equipment and nurses with specific training must be available.

Peritoneal dialysis is an indirect method of cleansing the blood of waste products using osmosis and diffusion. The

► BOX 43-1 Indications for Dialysis

Renal failure that can no longer be controlled by conservative management (i.e., dietary modifications and administration of medications to correct electrolyte abnormalities)

Worsening of uremic syndrome associated with end-stage renal disease (i.e., nausea, vomiting, neurological changes, pericarditis)

Severe electrolyte or fluid abnormalities that cannot be controlled by simpler measures (i.e., hyperkalemia, pulmonary edema)

peritoneum functions as a semipermeable membrane. Excess fluid and waste products are readily removed from the bloodstream when a sterile electrolyte solution (dialysate) is instilled into the peritoneal cavity by gravity via a surgically placed catheter. The dialysate is left in the cavity for a prescribed time interval and then drained out by gravity, taking accumulated wastes and excess fluid and electrolytes with it.

Hemodialysis involves using a machine equipped with a semipermeable filtering membrane (artificial kidney) that removes accumulated waste products and excess fluids from the blood. In the dialysis machine, dialysate fluid is pumped through one side of the filter membrane (artificial kidney) while the patient's blood passes through the other side. The processes of diffusion, osmosis, and ultrafiltration cleanse the patient's blood, which is returned through a specially placed vascular access device (Gore-Tex graft, arteriovenous fistula, or hemodialysis catheter).

Organ transplantation is the replacement of a patient's diseased kidney with a healthy one from a living or cadaver donor of compatible blood and tissue type. The new organ is surgically implanted into the abdomen. Special medications (immunosuppressives) are administered for life to prevent the body from rejecting the transplanted organ. Unlike dialysis, successful organ transplantation offers the patient the potential for restoration of normal kidney function.

Fluid Balance. Fluid balance directly affects the quantity of urine produced. The kidneys maintain a sensitive balance between retention and excretion of fluids (see Chapter 39). If fluids and the concentration of electrolytes and solutes are in equilibrium, an increase in fluid intake causes an increase in urine production. Ingested fluids increase the body's circulating plasma and thus increase the volume of urine excreted. In a healthy person, the intake of water in food and fluids balances the output of water in urine, feces, and insensible losses through perspiration and respiration. An excessive output of urine is known as **polyuria**, a common symptom of diabetes mellitus and diabetes insipidus.

Ingestion of certain fluids directly affects urine production and excretion. Coffee, tea, cocoa, and cola drinks that contain caffeine promote increased urine formation (**diuresis**). Alcohol inhibits the release of antidiuretic hormone (ADH), resulting in increased water loss in urine.

Febrile conditions also affect urine production. The patient who becomes diaphoretic (sweats profusely) loses a large amount of fluid through insensible water loss, which decreases urine production. However, the increased body metabolism associated with fever increases accumulation of body wastes. Although urine volume may be reduced, it is highly concentrated.

Medications. Medications may interfere with the production of urine and affect the act of urination. Diuretics

prevent reabsorption of water and certain electrolytes, resulting in a sudden increase in urine output that can challenge continence. Drugs with anticholinergic side effects such as tranquilizers or tricyclic antidepressants, anti-arrhythmics, sedating antihistamines, anti-Parkinsonian agents, and antispasmodics relax the bladder and can contribute to incomplete emptying and urinary retention (Mostwin et al., 2005). The drug-induced cough associated with angiotension-converting enzyme (ACE) inhibitors can precipitate stress incontinence. You must be aware of any prescribed and over-the-counter medications a patient is taking and how these medications may affect bladder function. Patients with altered kidney function require dosage modifications in any medications excreted by the kidneys.

Diagnostic Examination. Examination of the urinary system can influence micturition. Procedures such as an intravenous pyelogram may necessitate that the patient limit fluid intake before the test. A restriction in fluid intake commonly lowers urine output. A laxative used to cleanse the bowel also may limit fluid available for urine production. Diagnostic examinations (i.e., cystoscopy) that involve direct visualization of urinary structures may cause localized edema of the urethral passageway and spasm of the striated muscle. The patient often has urinary retention after such a procedure and may pass red or pink urine because of trauma to the urethral or bladder mucosa.

Surgical Procedures. The stress of surgery initially triggers the general adaptation syndrome (see Chapter 29). The surgical patient is often in an altered state of fluid balance before surgery due to the disease process or preoperative fasting, which aggravates the reduction in urine output. The stress response releases an increased amount of ADH, which increases water reabsorption. Stress also elevates the level of aldosterone, causing retention of sodium and water. Both of these substances reduce urine output in order to maintain circulatory volume. The decreased blood pressure after surgery releases renin and thus increases angiotensin II to increase vascular tone. This aids in counteracting the effects of ADH and aldosterone.

Anaesthetics and narcotic analgesics may alter the glomerular filtration rate (generally 125 mL/minute), reducing urine output. These pharmacological agents also impair sensory and motor impulses travelling between the bladder, spinal cord, and brain. Patients recovering from anaesthesia and deep analgesia are often unable to sense bladder fullness and unable to initiate or inhibit micturition. Spinal and epidural anaesthetics, in particular, may cause urinary retention because the patient cannot feel the need to void and the bladder muscle and sphincter may not respond (Sherwood, 2007).

Surgery involving lower abdominal and pelvic structures can impair urination because of local trauma to surrounding tissues. The edema and inflammation may obstruct the flow of urine from the kidneys to the bladder or from the bladder or urethra, interfere with relaxation of pelvic and sphincter muscles, or cause discomfort during voiding. After returning from surgery involving the ureters, bladder, and urethra, patients routinely have catheters.

The surgical formation of a **urinary diversion** temporarily or permanently bypasses the bladder and urethra as the exit routes for urine. Permanent urinary diversions may be needed in the patient with cancer of the bladder. The patient with a urinary diversion has a **stoma** (artificial opening) on the abdomen through which urine is drained.

Psychological Factors. Anxiety and emotional stress may cause a sense of urgency and increased frequency of urination. Anxiety also may prevent a person from being able to urinate completely; as a result, the urge to void may return shortly after urinating. Emotional tension makes it difficult to relax the abdominal and perineal muscles. If the sphincter is not completely relaxed, voiding may be incomplete.

Attempting to void in a public restroom also may result in a temporary inability to urinate. Privacy and adequate time to urinate are important to most people, and some may need distractions to help them relax (e.g., reading). The possibility that incomplete voiding may result from physiological abnormalities, however, must always be considered.

Common Alterations in Urinary Elimination

Most patients with urinary problems have disturbances in the act of micturition that involve a failure to store urine, a failure to empty urine, or both. Disturbances may be acute or chronic and result from infection, impaired bladder function, obstruction to urine outflow, or inability to control micturition voluntarily.

Urinary Tract Infections. Urinary tract infections (UTIs) are responsible for more than 500,000 visits to Canadian doctors every year (Kidney Foundation of Canada, 2007). If left untreated, UTIs can spread to the kidneys, causing kidney infection (**pyelonephritis**) and possibly long-term kidney damage.

Etiology. Although several different microorganisms may cause UTIs, *Escherichia coli* is the most frequent causative pathogen, accounting for 80% of uncomplicated infections. Between 10% and 20% of UTIs are caused by *Staphylococcus saprophyticus*, and approximately 5% are caused by *Klebsiella*, *Proteus*, and *Enterobacter* organisms.

Bacteria in the urine (**bacteriuria**) may lead to the spread of organisms into the kidneys and the bloodstream, leading to **urosepsis**. Bacteria usually enter the urinary tract by ascending the urethra. They inhabit the distal urethra, external genitalia, and vagina in women. Organisms enter the urethral meatus easily and travel up the inner mucosal lining to the bladder. Women are more susceptible to infection because of the short urethra and the proximity of the vaginal vestibule and rectum to the urethral meatus (Nguyen, 2008).

Infection depends on the virulence of the bacteria and the presence of host defence mechanisms. In a healthy person with good bladder function, organisms are flushed from the body during voiding. Normal urine has a low pH, which inhibits bacterial growth.

Although the short length of the female urethra makes women more susceptible to UTIs, organisms such as *Lactobacillus* that occur naturally in the periurethral area inhibit colonization of pathogenic bacteria. In addition, mucus-secreting glands found in the distal two-thirds of the female urethra impede bacterial ascension. In men, the length of the urethra and the presence of zinc, a powerful antimicrobial substance found in prostatic secretions, reduce susceptibility (Nguyen, 2008).

Alterations in any of these defence mechanisms can contribute to a UTI. For example, if the patient cannot empty the bladder when voiding or the free flow of urine is impeded, **residual urine** (urine left in the bladder after voiding) becomes more alkaline and is an ideal site for microorganism growth. Therefore, a kinked, obstructed, or clamped catheter or any condition resulting in urinary retention increases the risk of

bladder infection. Risk factors for urinary infection in women include sexual activity, pregnancy, diaphragm or spermicide use, and pelvic organ prolapse. UTIs are less common in men; risk factors include the introduction of instruments into the urinary tract (instrumentation) and congenital abnormalities (Nguyen, 2008). Older adults, patients using antibiotics, and patients with progressive underlying disease or decreased immunity are also at increased risk. Changes associated with aging, including **prostatic hypertrophy** and diminished bacteriocidal activity of prostatic secretions in men, and diminished estrogen in women, predispose older adults to bacteriuria (Juthani-Mehta, 2007). Prostatic hypertrophy, the enlargement of the prostate gland, is particularly troubling, as it can lead to obstruction of the urethral outlet and affects approximately 80% of men in their eighties. Patients with diabetes mellitus are especially susceptible to UTIs because increased glucose in the urine is a good medium for bacterial growth.

One of the most common causes of UTI, however, is instrumentation. UTIs account for nearly half (40%) of nosocomial, or hospital-acquired, infections (Saint et al., 2008). The introduction of a catheter through the urethra provides a direct route for microorganisms. Bacteria ascend along the outside of an indwelling catheter on the urethral wall or travel up the catheter's lumen, and bacteriuria is generally inevitable within two days. One hundred percent colonization can be expected after 30 days. Local irritation to the urethra or bladder also predisposes tissues to bacterial invasion. Catheter-related bacteriuria has been associated with a twofold to threefold increase in risk of death among hospitalized patients (Cottenden et al., 2005).

Signs and Symptoms. Patients with lower UTIs may experience pain or a burning sensation during urination (**dysuria**) as urine flows over inflamed tissues. Fever, chills, nausea, vomiting, and malaise may develop as the infection worsens. Inflammation of the bladder (**cystitis**) causes a frequent and urgent sensation of the need to void, and may cause **incontinence**. Irritation to bladder and urethral mucosa results in blood tinged urine (**hematuria**). The urine appears concentrated and cloudy because of the presence of white blood cells (WBCs) or bacteria. If infection spreads to the upper urinary tract (i.e., to the kidneys, causing pyelonephritis), rapid onset of flank or lower back pain, tenderness, fever, and chills can occur.

Lower UTIs also can be asymptomatic, particularly in pregnant women, children, and older adults. Asymptomatic UTIs generally are not treated in older adults, in part because no evidence of short-term or long-term adverse effects or impact on survival exists (Juthani-Mehta, 2007).

Urinary Incontinence. **Urinary incontinence (UI)** is the involuntary loss of urine (Abrams et al., 2002). It is a prevalent condition experienced by more than 3 million Canadians of all ages (Canadian Continence Foundation, 2007). Psychosocial impact ranges from minor lifestyle changes to self-imposed social isolation.

Urinary incontinence may present as any of the following types (Registered Nurses' Association of Ontario [RNAO], 2005):

- **Transient incontinence:** urine loss resulting from causes outside of or affecting the urinary system that resolves when the underlying causes are treated. Causes include dementia or acute confusion, infection (symptomatic UTI), atrophic urethritis or vaginitis in women, pharmaceuticals (medications), endocrine disorders, restricted mobility, and

stool impaction (DIAPERS).^{*} A more optimistic acronym—DISAPPEAR—has been proposed by Whytock (2006): *delirium, intake of fluids, stool impaction, atrophic vaginitis, psychological problems (depression), pharmaceuticals, excess urine output, abnormal lab values (e.g., hyperglycemia), and restricted mobility.*

- **Urge incontinence:** urine loss associated with or immediately preceded by a sudden and urgent need to void that cannot be postponed. Individuals with urge incontinence generally present with **urinary frequency** (need to void more often than every two hours) and **nocturia** (voiding overnight). Causes include nervous system disorders (cerebrovascular accident, multiple sclerosis) and outflow obstruction, particularly in men with an enlarged prostate, but urge incontinence also may be idiopathic (of unknown origin).
- **Stress incontinence:** generally small volume (<50 mL) urine loss resulting from increased intra-abdominal pressure (e.g., coughing, sneezing, laughing, lifting). Stress incontinence is most common in women and in men after radical prostatectomy. Weak pelvic floor muscles and supportive tissue, obesity, and lifestyle factors such as heavy lifting are contributing factors.
- **Mixed incontinence:** urine loss that has features of both stress and urge incontinence.
- **Functional incontinence:** urine loss caused by alterations in cognitive or physical function or by environmental factors. The person has bladder control but is unable to reach the toilet. Causes may include confusion, difficulty removing clothing, or immobility. Older patients with restricted mobility are at high risk.
- **Overflow incontinence:** small or large amounts of urine loss associated with overdistension of the bladder. The person may feel as if the bladder is never completely empty. Overflow incontinence may be associated with bladder outlet obstruction, fecal impaction, diabetes, spinal cord injury, prostate enlargement, or severe uterine prolapse.
- **Reflex incontinence:** involuntary urine loss that occurs at somewhat predictable intervals. The person is unaware that the bladder is filling and does not feel the urge to void, but the bladder contracts spontaneously. Reflex incontinence may be caused by spinal cord dysfunction (inhibition of cerebral awareness or impairment of the reflex arc).
- **Total incontinence:** continuous and unpredictable loss of urine caused by damage to the nerves that control the bladder. It may be a result of spinal deformities such as spina bifida or scoliosis, spinal cord injury, or advanced disease such as multiple sclerosis or Alzheimer's disease. Repeated pelvic surgery also may cause total incontinence from scarring of the urethra.

safety alert Continued episodes of incontinence create the potential for skin breakdown. The immobilized patient who experiences frequent incontinence is especially at risk for pressure ulcers (see Chapter 46). Timely and meticulous skin care is essential.

Overactive Bladder Syndrome. Overactive bladder syndrome (OAB) is a symptom-based syndrome characterized predominantly by the presence of urgency, the sudden and compelling desire to void that is difficult to postpone (Abrams

et al., 2002). Approximately 16% to 18% of adults experience OAB; one-third of these adults also experience urge incontinence. Similar to urge incontinence, OAB can be idiopathic but is commonly attributed to changes associated with nervous system disorders and outflow obstruction. OAB may be aggravated by caffeinated beverages, although effects appear to be dose-dependent (Getliffe & Fader, 2007).

Nocturia. Nocturia has been defined as waking at night to void (Fonda et al., 2005). It is associated with aging and an overactive bladder, as well as with an enlarged prostate in men. Patients with peripheral edema (e.g., caused by circulatory problems associated with venous insufficiency) may experience nocturia because lying down facilitates reabsorption of pooled fluid and leads to increased urinary output overnight (Mostwin et al., 2005). Causes are generally categorized as **diurnal polyuria** (excessive production of urine during the day, as can occur with diabetes mellitus or diabetes insipidus), **nocturnal polyuria** (at least one-third of total daily urine production occurs overnight), or low bladder capacity (Appell & Sand, 2008). The latter may be due to an overactive bladder or a compromised urethral closure that affects urine storage, or to reduced functional capacity.

Regardless of the cause, it is important to learn whether a patient wakes at night to void, or voids because he or she is awake. Treatment options include reducing fluid intake in the evening, elevating the feet for one to two hours before bedtime to encourage return of fluid from the lower extremities, medication to reduce the volume of urine produced overnight, or medication to relax the bladder muscle.

Urinary Retention. Urinary retention is the marked accumulation of urine in the bladder as a result of the bladder's inability to empty. Normally, urine production slowly fills the bladder and prevents activation of stretch receptors until the bladder distends to a certain extent. The micturition reflex then occurs, and the bladder empties. With urinary retention, the bladder becomes unable to respond to the micturition reflex and thus is unable to empty. Urine continues to collect in the bladder, causing feelings of pressure, discomfort, tenderness over the symphysis pubis, restlessness, and diaphoresis. As retention progresses, overflow incontinence may occur. Pressure in the bladder builds to a point at which the urethral sphincter is unable to hold back urine and a small volume escapes (<75 mL). The patient may void small amounts of urine two or three times an hour with little relief of discomfort.

Urinary retention results from an underactive or acontractile detrusor muscle, urethral obstruction (more common in men and usually related to prostatic enlargement), surgical or childbirth trauma, alterations in motor and sensory innervation of the bladder, medication side effects (e.g., anticholinergics), or fecal impaction. **Urethral stricture**, a narrowing of the urethral canal that can be congenital or acquired as a result of infection or trauma, is also a more common cause of urinary retention in men.

You should be aware of the volume and frequency of voiding to assess this condition in the patient. Key signs of urinary retention are absence of urine output over several hours, bladder distension, restlessness, diaphoresis, and moderate to extreme abdominal discomfort. A patient under the influence of anaesthetics or analgesics may feel only pressure, but an alert patient experiences severe pain as the bladder distends beyond its normal capacity. In severe urinary retention, the bladder may hold as much as 2000 to 3000 mL of urine.

^{*}The acronym DIAPERS was coined by Resnick (1984) to help clinicians remember the causes, but it is not used in medical notes.

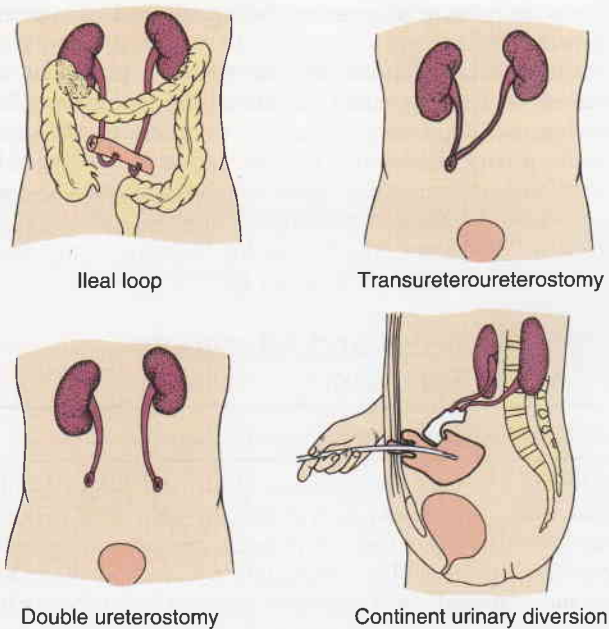


Figure 43-5 Types of urinary diversions.

Intermittent catheterization may be needed to empty the bladder and reduce the risk of overflow incontinence and UTI.

Urinary Diversions. A urinary stoma to divert the flow of urine from the kidneys directly to the abdominal surface is created for several reasons, including cancer of the bladder, trauma, radiation injury to the bladder, fistulas, and chronic cystitis. A urinary diversion may be temporary or permanent. The patient with an incontinent urinary diversion must wear an ostomy appliance continuously because no sphincter control exists to regulate urine flow. Local irritation and skin breakdown occur when urine comes in contact with the skin for long periods. Figure 43-5 illustrates several approaches to urinary diversion.

The ileal loop or conduit involves separating a loop of intestinal ileum with its blood supply intact. The ureters are implanted into the isolated segment of ileum. The remaining ileum is reconnected to the rest of the digestive tract. The ileal segment can then be used as a conduit for continuous urine drainage or fashioned into a continent reservoir (Konety et al., 2008). The continent pouch is constructed to provide urinary storage in a leak-proof pouch. The portion of the ileum connected to the abdominal wall acts as a continent nipple, and intermittent catheterization is therefore needed for emptying. The disadvantage of an ileal conduit or reservoir is that if urine outflow becomes obstructed, irreversible damage to the kidneys can occur secondary to chronic infections or hydronephrosis.

A **ureterostomy** involves bringing the end of one or both ureters to the abdominal surface. To avoid the need for two collecting devices, a transureteroureterostomy connects the ureters and brings one out through the abdominal wall. In some cases, a tube may need to be placed directly into the renal pelvis to provide urinary drainage. This procedure is called a **nephrostomy**.

It is essential that stoma appliances fit correctly, that the patient (or caregiver) is capable of changing the appliance easily, and that skin around the stoma remains protected and intact. Unprotected skin that comes in contact with urine will

quickly become macerated and break down, causing pain, infection, increased hospital stays, and potential breakdown of the stoma. All patients must be referred to an enterostomal nurse for preoperative stoma fitting and assessment and should be followed closely for several months postoperatively. The patient should also be referred to the United Ostomy Association of Canada, an invaluable source of advice and networking.

A urinary diversion poses threats to a patient's body image, and adjustment to it takes time. Although a normal lifestyle is possible with a stoma, adjustment can be difficult and each person will cope differently.

Nursing Knowledge Base

Urinary elimination is a basic human function that is usually a private process. Nurses are often the first to become aware that a patient has elimination problems and must be alert to cues, prepared to discuss relevant assessment and treatment options, and able to provide counselling and support. These skills require a sound base of scientific knowledge related to anatomy and physiology, as well as an understanding of concepts such as infection control and hygiene, normal growth and development, and psychosocial and cultural considerations.

Infection Control and Hygiene

The urinary tract is considered to be sterile. You must use infection-control principles to help prevent the development and spread of UTIs, as well as to treat existing infections (see Chapter 32). Hospital-acquired UTIs are often related to poor hand hygiene, improper catheter care, or faulty catheterization technique (Nguyen, 2008). Knowledge of both medical and surgical asepsis must be applied meticulously when providing care involving the urinary tract and external genitalia. Any invasive procedure of the urinary tract such as catheterization necessitates sterile technique. Procedures such as perineal care or examination of the genitalia necessitate medical asepsis.

Growth and Development

Growth and development factors determine the patient's ability to control the act of urination during the lifespan. Infants and young children cannot concentrate urine effectively. Their urine appears light yellow and clear.

Relative to their small body size, infants and children excrete large volumes of urine. For example, a six-month-old infant who weighs 6 to 8 kg excretes 400 to 500 mL of urine daily. As the neurological system matures, a toddler of two to three years of age is able to associate the sensations of bladder filling and urination. A child must be able to recognize the feeling of bladder fullness, hold urine for one to two hours, and communicate the sense of urgency to an adult. Many toddlers may then be able to control the urethral sphincter, and toilet training can begin. Young children need their parents' understanding, patience, and consistency. A child may not gain full control of micturition until four or five years of age. Daytime control of micturition is easier to accomplish than nighttime control and occurs earlier in the child's development, usually by two years of age. Occasional daytime accidents or nocturnal enuresis (bedwetting) may continue until five years of age.

The adult normally voids 1500 to 1600 mL of urine daily, or approximately 500 mL every four hours. During pregnancy,

urinary frequency is common and susceptibility to UTIs is increased. In women, childbearing and hormonal changes during menopause may contribute to urinary difficulties. In men, prostate enlargement can begin in the forties and continue throughout the lifespan, resulting in urinary frequency and possibly retention.

Changes in kidney and bladder function also occur with aging. The kidney's ability to concentrate urine or reabsorb water and sodium declines. Alterations in kidney function include a reduction in glomerular filtration rate, from 125 mL per minute in younger adults to 60 to 70 mL per minute in adults 80 years of age. The older adult often experiences nocturia, due in part to age-related changes in vasopressin secretion (Fonda et al., 2005). The functional capacity of the bladder decreases, resulting in increased urinary frequency. Detrusor contractility also decreases, contributing to less effective emptying, elevated postvoid residuals (the volume remaining in the bladder after a void), and increased susceptibility to UTIs. A decrease in urethral closure pressure in women, which is generally associated with a decline in estrogen levels, can contribute to an increase in incontinence (Fonda et al., 2005). Older men commonly experience incomplete bladder emptying associated with prostatic enlargement.

Psychosocial and Cultural Considerations

You must consider that urinary elimination problems may result in alterations of sexuality and self-concept (which includes body image, self-esteem, roles, and identity). The embarrassment associated with elimination problems may delay or prevent help seeking. Individuals with incontinence often blame themselves for their condition and go to great lengths, including self-imposed social isolation, to keep others from finding out about it. Nurses must therefore initiate discussion by asking patients if they are experiencing any issues related to urinary elimination or bladder control as a routine part of care. It is also important to determine how bothersome symptoms are for each patient before planning care. The patient and clinician may have different perceptions of the severity of symptoms (Avery et al., 2007) so it is important to understand a patient's goals and expectations for treatment to ensure that interventions are realistic.

Sociocultural factors may influence the patient's expectation of the degree of privacy and location for attending to urinary needs. Your approach to a patient's elimination needs must consider cultural, social, and gender habits. If a patient prefers privacy, try to prevent interruptions as the patient voids. A patient with less need for privacy should also be treated with understanding and acceptance. Ensure that the patient is comfortable when he or she is trying to void. In some cultures, people prefer to squat over a receptacle rather than sit on one. Culture dictates when and where it is appropriate to urinate. In some cultures, a woman with urinary needs should be assisted only by another woman.

Critical Thinking

Critical thinking during assessment of urinary elimination requires the integration of evidence-informed knowledge from nursing and other disciplines, experiential knowledge, and an understanding of the patient's perceptions of the alterations in elimination and their impact. Critical thinking also involves an understanding of relevant cultural, environmental, and personal factors, including the unique goals of every patient. Empathy, teaching, and ongoing support are needed

to assist the patient in meeting these goals and maintaining improvement.

Professional standards provide valuable directions for treatment and management of elimination problems. When planning and implementing care for the patient with alterations in urinary elimination, use the standards developed by professional organizations such as the Canadian Nurses Association, the Canadian Nurse Continence Advisors, the Canadian Continence Foundation, the United Ostomy Association of Canada, and the Urology Nurses of Canada.

Nursing Process and Alterations in Urinary Function

Assessment

To identify a urinary elimination problem and gather data for a care plan, you obtain information by collecting a health history, performing a focused physical assessment, assessing the patient's urine, and reviewing information from diagnostic tests and examinations. Use critical thinking to synthesize this information as assessment proceeds (Figure 43-6). Adequate

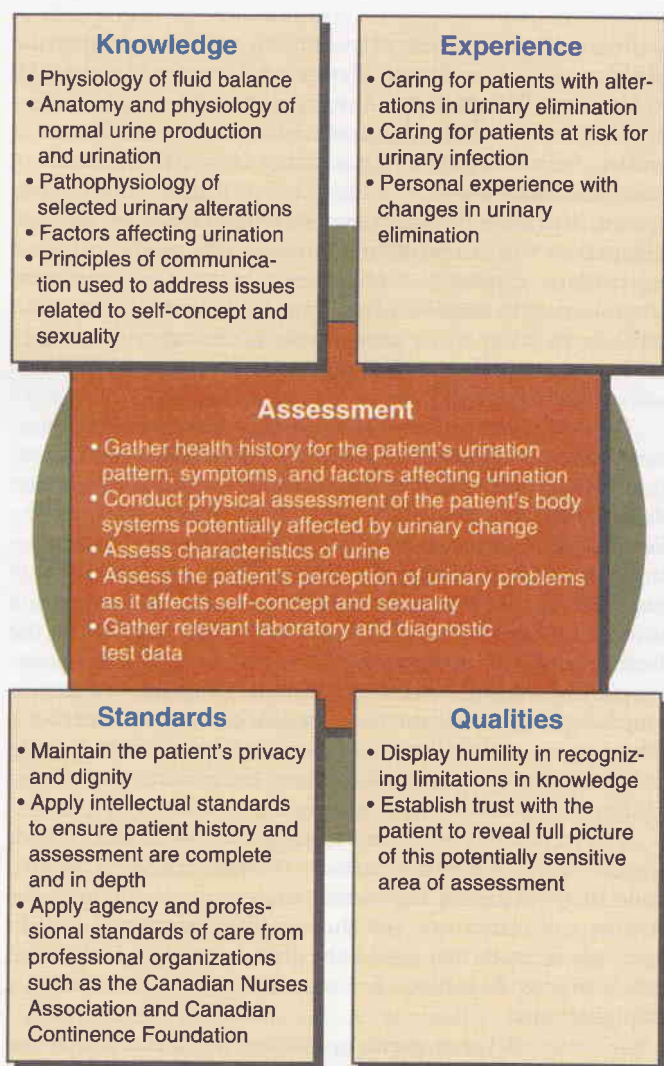


Figure 43-6 Critical thinking model for urinary elimination assessment.

assessment should result in the formulation of nursing diagnoses appropriate for alterations in urinary elimination. You should be alert to individual needs related to normal aging that predispose older adults to certain elimination problems (Box 43-2).

* BOX 43-2 FOCUS ON OLDER ADULTS

- Physiological changes in the lower urinary tract occur in continent as well as incontinent older adults.
- Dilute urine discourages bacterial growth; therefore, older adults should be encouraged to increase their fluid intake to at least six glasses a day, unless medically contraindicated (Dubeau et al., 2009).
- Fluids that promote an acidic urine (e.g., cranberry juice) should be made available as part of the patient's fluid intake because an acidic urine also helps to inhibit bacterial growth and may prevent UTIs (Nguyen, 2008).
- Restriction of fluids two hours before sleep, combined with elevating the legs to allow for venous return and bladder emptying before bedtime (leg elevation for at least one hour) may decrease the incidence of nocturia (Dubeau et al., 2009).
- In-dwelling catheters should not be used routinely in older adults unless other options have been tried. The risk of infection increases dramatically for catheterized patients (Juthani-Mehta, 2007).
- Treating asymptomatic bacteriuria in older adults is not recommended.
- Incontinence is not a normal part of aging, and efforts should be made to assess incontinence and provide interventions to promote return to continence.



Health History

The nursing health history includes a review of the patient's urinary elimination patterns and symptoms of urinary alterations and an assessment of factors that may affect the ability to urinate normally.

Pattern of Urination. Ask the patient about usual daily voiding patterns and any recent changes. Information about voiding symptoms such as hesitancy (Table 43-1) and the overall pattern of urination, including average time between voids and episodes of urgency and incontinence, is important to a nursing assessment and establishes a baseline for comparison.

A **urinary diary** is an important diagnostic tool (Figure 43-7), particularly because many adults are not aware of how often they void throughout the day. A diary is kept by the patient or the caregiver; it records approximate times of urination, times of leakage and estimates of the amount lost (dribbled, wet pad, wet clothing), and types and amount of fluids ingested. Measuring two or more voids (not including the first void of the morning) will provide useful information about the volume of urine that a patient generally stores. Recording factors that precipitated urination or leakage, such as a strong urge or a cough, is particularly helpful. The number of pad changes per day is also useful information. A three-day (72-hour) voiding diary helps in evaluating lifestyle habits (e.g., fluid intake) in relation to the voiding pattern and symptoms (Ermer-Seltun, 2006).

Factors Affecting Urination. It is important to summarize the factors associated with the patient's medical history, surgical history, and current environment that may affect urination. Medical history includes disease conditions that can affect elimination, such as multiple sclerosis, spinal cord injury, stroke, and diabetes. Another factor to consider is the patient's

► TABLE 43-1 Common Symptoms of Urinary Alterations

Symptom	Description	Common Causes or Associated Factors
Incontinence	Involuntary loss of urine	Multiple factors: urethral hypermobility, loss of pelvic floor muscle tone, fecal impaction, neurological impairment, pelvic organ prolapse
Urgency	Sudden and compelling urge to void that cannot be postponed	Overactive bladder syndrome that is neurogenic, sensory, or idiopathic; calculi or tumour; urinary tract infection (UTI)
Dysuria	Painful or difficult urination	Bladder inflammation; urethral trauma; UTI; inflammation of urethra, sphincter, or both
Frequency	Voiding more than eight times in 24 hours	Increased fluid intake, bladder infection or inflammation, increased pressure on bladder (pregnancy, psychological stress), incomplete emptying, small bladder capacity, overactive bladder syndrome, polyuria
Hesitancy	Difficulty initiating urination	Hypotonic bladder, anxiety, urethral stricture, obstruction associated with prostate enlargement
Polyuria	Voiding large amounts of urine	Excess fluid intake, diabetes mellitus or diabetes insipidus, use of diuretics, postobstructive diuresis
Oliguria	Diminished urinary output relative to intake (usually 400 mL/24 hours)	Dehydration, renal failure, increased antidiuretic hormone (ADH) secretion, heart failure
Nocturia	Getting up at night to void	Excessive fluid intake before bed (especially coffee or alcohol), renal disease, aging process, cardiovascular insufficiency, prostate enlargement, sleep apnea
Dribbling	Leakage of urine despite voluntary control of urination	Stress incontinence, overflow from urinary retention, postvoid pooling of urine in the urethra (men)
Hematuria	Blood in the urine	Neoplasms of the kidney or bladder, glomerular disease, infection of kidney or bladder, trauma to urinary structures, calculi, bleeding disorders, UTI
Retention	Accumulation of urine in the bladder, with inability of bladder to empty fully	Urethral obstruction, bladder inflammation, decreased sensory activity, neurogenic bladder, prostate enlargement, postanaesthesia effects, side effects of medications (e.g., anticholinergics, antidepressants)
Elevated postvoid residual urine	Elevated volume of urine remaining after voiding (>100 mL)	Neurogenic bladder, prostate enlargement, trauma, inflammation of urethra, inflammation or irritation of bladder mucosa from infection

Bladder Diary DAY 1

TIME	AMOUNT URINATED		URGENCY?		LEAKAGE		DRINKS	
	How many times	How much	Yes	No	How many times	How much	Which drink	How much
EXAMPLE:	3 times	☐ A little ☒ Some ☐ A lot	☒	☐	once	☒ A little ☐ Some ☐ A lot	water	1 cup
6-8 am		☐ A little ☐ Some ☐ A lot	☐	☐		☐ A little ☐ Some ☐ A lot		
8-10 am		☐ A little ☐ Some ☐ A lot	☐	☐		☐ A little ☐ Some ☐ A lot		
10-12 pm		☐ A little ☐ Some ☐ A lot	☐	☐		☐ A little ☐ Some ☐ A lot		
12-2 pm		☐ A little ☐ Some ☐ A lot	☐	☐		☐ A little ☐ Some ☐ A lot		
2-4 pm		☐ A little ☐ Some ☐ A lot	☐	☐		☐ A little ☐ Some ☐ A lot		
4-6 pm		☐ A little ☐ Some ☐ A lot	☐	☐		☐ A little ☐ Some ☐ A lot		
6-8 pm		☐ A little ☐ Some ☐ A lot	☐	☐		☐ A little ☐ Some ☐ A lot		
8-10 pm		☐ A little ☐ Some ☐ A lot	☐	☐		☐ A little ☐ Some ☐ A lot		
10-12 pm		☐ A little ☐ Some ☐ A lot	☐	☐		☐ A little ☐ Some ☐ A lot		
12-2 am		☐ A little ☐ Some ☐ A lot	☐	☐		☐ A little ☐ Some ☐ A lot		
2-4 am		☐ A little ☐ Some ☐ A lot	☐	☐		☐ A little ☐ Some ☐ A lot		
4-6 am		☐ A little ☐ Some ☐ A lot	☐	☐		☐ A little ☐ Some ☐ A lot		

☐ A little ☒ Some ☐ A lot

Bladder Diary DAY 2

TIME	AMOUNT URINATED		URGENCY?		LEAKAGE		DRINKS	
	How many times	How much	Yes	No	How many times	How much	Which drink	How much
EXAMPLE:	3 times	☐ A little ☒ Some ☐ A lot	☒	☐	once	☒ A little ☐ Some ☐ A lot	water	1 cup
6-8 am		☐ A little ☐ Some ☐ A lot	☐	☐		☐ A little ☐ Some ☐ A lot		
8-10 am		☐ A little ☐ Some ☐ A lot	☐	☐		☐ A little ☐ Some ☐ A lot		
10-12 pm		☐ A little ☐ Some ☐ A lot	☐	☐		☐ A little ☐ Some ☐ A lot		
12-2 pm		☐ A little ☐ Some ☐ A lot	☐	☐		☐ A little ☐ Some ☐ A lot		
2-4 pm		☐ A little ☐ Some ☐ A lot	☐	☐		☐ A little ☐ Some ☐ A lot		
4-6 pm		☐ A little ☐ Some ☐ A lot	☐	☐		☐ A little ☐ Some ☐ A lot		
6-8 pm		☐ A little ☐ Some ☐ A lot	☐	☐		☐ A little ☐ Some ☐ A lot		
8-10 pm		☐ A little ☐ Some ☐ A lot	☐	☐		☐ A little ☐ Some ☐ A lot		
10-12 pm		☐ A little ☐ Some ☐ A lot	☐	☐		☐ A little ☐ Some ☐ A lot		
12-2 am		☐ A little ☐ Some ☐ A lot	☐	☐		☐ A little ☐ Some ☐ A lot		
2-4 am		☐ A little ☐ Some ☐ A lot	☐	☐		☐ A little ☐ Some ☐ A lot		
4-6 am		☐ A little ☐ Some ☐ A lot	☐	☐		☐ A little ☐ Some ☐ A lot		

☐ A little ☒ Some ☐ A lot

Figure 43-7 Sample urinary diary. **Source:** Canadian Continence Foundation. (2010). *The source: Your guide to better bladder control* (pp. 12–13). Peterborough, ON: Author. Retrieved from <http://www.canadiancontinence.ca/pdf/The-Source.pdf>.

bowel elimination pattern. Constipation often interferes with normal urine elimination. Medication history, including the name, amount, and frequency of each prescription and over-the-counter medication, should also be noted as part of the medical history.

Relevant surgical history (e.g., urological and gynecological interventions, pelvic radiation) should be considered because surgery may cause scarring and disruption of neurological pathways. The presence or history of an in-dwelling catheter should be noted because of the potential for infection, catheter blockage, or skin care problems. Environmental barriers in the home or health care setting also should be evaluated. The patient's mobility and ability to dress or undress and use the toilet independently should be assessed. Such aids as elevated toilet seats, grab bars, or a portable commode may be needed.

One of the most important parts of the assessment is the impact of alterations in elimination on the patient's lifestyle and quality of life. The impact of urinary incontinence in particular can be substantial; it is important to discuss changes the patient has made to cope with the condition. It is also

important to note whether the patient has previously seen a health care provider for help with or advice on urination.

Physical Assessment

A physical examination (see Chapter 31) provides you with data with which you can determine the presence and severity of urinary elimination problems. The primary structures reviewed are the skin and mucosal membranes, kidneys, bladder, and perineum.

Skin and Mucosal Membranes. Assess the condition of the skin and mucosal membranes. Problems with urinary elimination are often associated with fluid and electrolyte disturbances. By assessing skin turgor and the oral mucosa, you assess the patient's hydration status. Urinary incontinence increases the risk of skin breakdown (see Chapter 46).

Kidneys. Flank pain usually develops if the kidneys become infected or inflamed. Assess for flank tenderness early in the disease by percussing the costovertebral angle (the angle formed by the spine and the twelfth rib). Auscultation is also performed to detect the presence of a renal artery bruit (sound

resulting from turbulent blood flow through a narrowed artery).

Nurses with advanced examination skills learn to palpate the kidneys during abdominal examination. The kidneys' position, shape, and size can reveal renal swelling.

Bladder. In adults, the bladder rests below the symphysis pubis and is difficult to palpate. When distended, the bladder rises above the symphysis pubis at the midline of the abdomen and may extend to just below the umbilicus. On inspection, you may note a swelling or convex curvature of the lower abdomen. You should lightly palpate the lower abdomen. The partially filled bladder normally feels smooth and rounded. As you apply light pressure to the bladder, the patient may feel the urge to urinate, tenderness, or even pain. Percussion of a full bladder yields a dull note.

The Female Perineum. When examining the female patient, request that she assume a dorsal recumbent position to provide full exposure of the genitalia. Inspect the perineum for skin integrity and for the presence of a rash associated with incontinence and the use of containment pads. The rash may be monilial (maculopapular, red rash) or an ammonia contact perineal dermatitis (papular with macerated skin).

Assess the vaginal vault for signs of vaginitis, a common result of estrogen depletion after menopause (Mostwin et al., 2005). Signs include dry, thin, pale mucosa; erosions; and tenderness or sensitivity to touch. Inspect the vaginal orifice carefully for signs of inflammation and describe any drainage.

Also, assess the urethral meatus and note the presence of any discharge, inflammation, or lesions. Normally the meatus is pink and appears as a small, slitlike opening below the clitoris and above the vaginal orifice. It may recede well into the vaginal vault with aging, making catheterization difficult. Discharge from the meatus is normally not present. If it is present, specimens of urethral discharge should be obtained before the patient voids.

Pelvic floor muscle strength can be digitally assessed in women by gently inserting a gloved finger into the vagina. Ask the patient to squeeze around your finger as firmly as possible, and then hold the contraction (generally for three to five seconds). Digital assessment is very useful in helping the patient to identify the pelvic floor muscles correctly.

The Male Perineum. The male urethral meatus normally appears as a small opening at the tip of the penis. You should inspect the meatus for any discharge, inflammation, or lesions. If the foreskin needs to be retracted in uncircumcised men to see the meatus, it must be replaced to avoid constriction of the glans. Disposable gloves should be worn when retracting the foreskin. Pelvic floor muscle strength can be digitally assessed in men by gently inserting a gloved finger into the rectum and asking the patient to squeeze around it.

Assessment of Urine

Assessment of urine involves measuring the patient's fluid intake and urine output and observing characteristics of the urine.

Intake and Output. It is important to assess the patient's average daily fluid intake. If an accurate measurement of fluid intake is needed from the patient who is at home, ask him or her to show a commonly used glass or cup on which the intake estimate is based. In a health care setting, measure a patient's fluid intake either when the physician orders intake and output measurements or when nursing judgement warrants a more precise measurement (see Chapter 39). A change in urine

volume is a significant indicator of fluid alterations or kidney disease. While caring for the patient, assess urine volume by measuring output with each voiding (using plastic receptacles, bedpans, or urinals). Special receptacles (urimeters) attach between in-dwelling catheters and drainage bags and are a convenient means of accurately measuring urine volume. A urimeter holds 100 to 200 mL of urine. After measuring urine with a urimeter, you can drain the cylinder into the urinary drainage bag or into a receptacle for disposal. Urimeters are indicated when precise hourly measurements of urine are needed.

When urine from a drainage bag is measured, the urine should be drained into a plastic graduated receptacle for more precise measurement of output (Figure 43-8). Each patient should have a graduated receptacle for his or her exclusive use to prevent potential cross-contamination.

You should report any extreme increase or decrease in urine volume. An hourly output of less than 30 mL for more than two hours is cause for concern. Similarly, consistently high volumes of urine (polyuria), over 2000 to 2500 mL daily, should be reported to a physician.

Characteristics of Urine. You will inspect the patient's urine for colour, clarity, and odour.

Colour. Normal urine ranges from a pale, straw colour to amber, depending on its concentration. Urine is usually more concentrated in the morning or with fluid volume deficits. As a person drinks more fluids, urine becomes less concentrated.

Bleeding from the kidneys or ureters causes urine to become dark red; bleeding from the bladder or urethra causes urine to become bright red. Various medications and foods also change

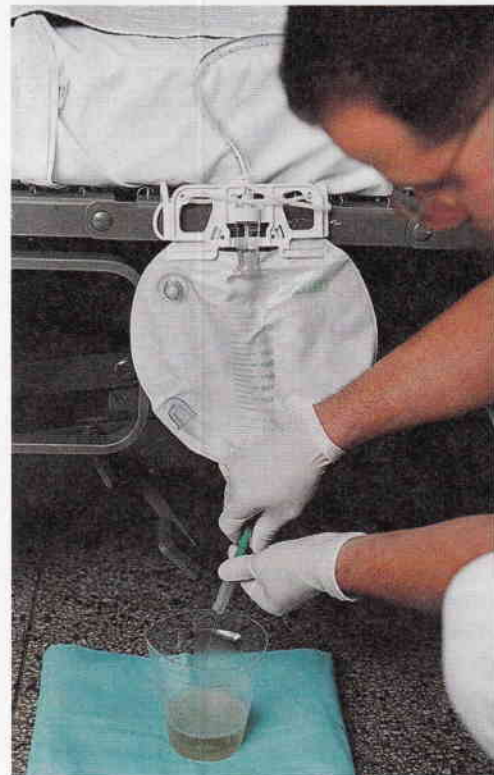


Figure 43-8 Urine drainage bag.

▶ TABLE 43-2 Urine Testing

**Collection Type (Use of Specimen)**

Random specimen (routine urinalysis)

Clean-voided or midstream specimen (culture and sensitivity)

Sterile specimen (culture and sensitivity)

Timed urine specimens (for measuring levels of adrenal cortical steroids or hormones, creatinine clearance, or protein quantity tests)

Nursing Considerations

Can be collected during normal voiding, from an in-dwelling catheter or a urinary diversion collection bag. Collected in a clean specimen cup.

See Skill 43-1. Collected in a sterile specimen cup.

If the patient has an in-dwelling catheter, a sterile specimen can be collected using the aseptic technique through the special port (see Figure 43-9) found on the side of the catheter. If the catheter has been in situ for more than three days, it should be changed before the specimen is collected to avoid contamination by organisms in the catheter lumen.

Clamp the tubing below the port, allowing fresh, uncontaminated urine to collect in the tube. After wiping the port with an antimicrobial swab, insert a sterile syringe needle and withdraw at least 3 to 5 mL of urine. Using the sterile aseptic technique, transfer the urine to a sterile container (see Chapter 32).

Time required between collections may be 2, 12, or 24 hours. The timed period begins after the patient urinates and ends with a final voiding at the end of the time period. The patient voids into a clean receptacle, and the urine is transferred to the special collection container, which may contain special preservatives. Each specimen must be free of feces and toilet tissue. Missed specimens make the entire collection inaccurate. Check agency policy and with the laboratory for specific instructions.

urine colour and will cause a false positive on a urinalysis. For example, phenazopyridine, a urinary analgesic, colours the urine bright orange. Eating beets, rhubarb, or blackberries may cause red urine. Special dyes used in intravenous diagnostic studies also discolour urine. Dark amber urine may result from high concentrations of bilirubin caused by liver dysfunction or vitamin B. Document and report any abnormal colour or sediment, especially if the cause is unknown.

Clarity. Normal urine appears transparent at voiding. Urine that stands for several minutes in a container becomes cloudy. Freshly voided urine in patients with renal disease may appear cloudy or foamy because of high protein concentrations. Urine also will appear thick and cloudy as a result of bacteria.

Odour. Urine has a characteristic odour. The more concentrated the urine, the stronger the odour. Stagnant urine has an ammonia odour, which is common in patients who are repeatedly incontinent. A sweet or fruity odour occurs from acetone or acetoacetic acid (by-products of incomplete fat metabolism) seen with diabetes mellitus or starvation.

Urine Testing. It is common to collect urine specimens for laboratory testing (Table 43-2). The type of test being done determines the method of collection. All specimens are labelled with the patient's name, the date, and the time of collection. Specimens should be transported to the laboratory quickly to ensure accuracy of test results. Agency infection control policies require adherence to standard precautions or routine practices by all personnel during the handling of specimens (see Chapter 32).

Specimen Collection. You will collect random, clean-voided or midstream (Skill 43-1), sterile (Figure 43-9), and timed specimens.

Urine Collection in Children. Collecting specimens from infants and children is often difficult. School-aged children and adolescents are usually able to cooperate, although they may be embarrassed. Preschool children and toddlers have difficulty voiding on request. Offering a young child fluids 30



Figure 43-9 Urine specimen collection: aspiration from a collection port in drainage tubing on an in-dwelling catheter.

minutes before requesting a specimen may help. You must use terms for urination that the child can understand. A young child may be reluctant to void in unfamiliar receptacles. A potty-chair or specimen hat placed under the toilet seat is usually effective. You must use special collection devices for infants and toddlers who are not toilet trained. Clear plastic, single-use bags with self-adhering material can be attached over the child's urethral meatus. Specimens should not be obtained by squeezing urine from the diaper material because test results may be inaccurate.

Common Urine Tests

Urinalysis. The laboratory performs a **urinalysis** on a specimen obtained through any of the previously described methods. Table 43-3 lists normal values for a urinalysis. The specimen should be examined as soon as possible after it is collected, preferably within two hours. It should be the first voided specimen in the morning to ensure a uniform concentration of constituents. For a quick screening, you can perform

► SKILL 43-1 Collecting a Midstream (Clean-Voided) Urine Specimen



Delegation Considerations

Collecting a midstream (clean-voided) urine specimen may be delegated to unregulated care providers (UCPs). If appropriate, an alert patient who is physically able may be instructed to collect the specimen. It is your responsibility to ensure that this specimen is obtained correctly and in a timely manner. Be aware of agency policy regarding specimen collection.

Instruct the UCP to inform you of the following:

- When the specimen was obtained
- Whether the patient was unable to initiate a stream or had pain or burning on urination
- Whether the collected specimen is dark, bloody, or cloudy; is odorous; or contains mucus

Equipment

- Soap or cleansing solution, washcloth, towel, and handwashing basin
- Commercial kit for clean-voided specimen or individual supplies as listed
- Sterile cotton balls or sterile gauze pads
- Antiseptic solution (e.g., chlorhexidine or povidone-iodine); check for patient allergy, and if allergy exists, provide an alternative
- Sterile water
- Sterile specimen collection cup or jar
- Sterile and nonsterile (disposable) gloves
- Bedpan, bedside commode, or specimen hat
- Completed specimen label
- Completed laboratory requisition form

Procedure

STEPS

1. Assess voiding status of patient:
 - A. When patient last voided
 - B. Level of awareness or developmental stage
 - C. Mobility, balance, and physical limitations
2. Assess patient's understanding of purpose of test and method of collection.
3. Explain procedure to patient:
 - A. Reason midstream specimen is needed
 - B. Ways patient and family can assist
 - C. Ways to obtain specimen free of feces
4. Provide fluids to drink a half-hour before collection unless contraindicated (i.e., fluid restriction) if patient does not feel urge to void.
5. Identify patient and perform hand hygiene.
6. Provide privacy for patient by closing door or bed curtain.
7. Give patient or family members soap, washcloth, and towel to cleanse perineal area.
8. Apply nonsterile gloves and assist nonambulatory patients with perineal care. Assist female patient onto bedpan. Raise head of bed.
9. Using surgical asepsis, open sterile kit (see Step 9 illustration) or prepare sterile supplies. Apply sterile gloves after opening sterile cup, placing cap with sterile inside surface up; do not touch inside of container or cap (see Chapter 32).



Step 9 Commercial midstream urine collection kit.

RATIONALE

- May indicate readiness to void.
- Reveals patient's ability to cooperate during procedure.
- Determines level of assistance in acquiring specimen.
- Information allows for clarification and promotes patient cooperation.
- Helps patient understand the procedure.
- Feces change characteristics of urine and may cause abnormal values.
- Improves likelihood of patient being able to void.
- Ensures accuracy of specimen collection. Decreases likelihood of transfer of microorganisms.
- Privacy allows patient to relax and produce specimen more quickly.
- Patient may prefer to wash own perineal area. Cleansing prevents contamination of specimen as urine passes from urethra.
- Provides easy access to perineal area to collect specimen. Semisitting position may ease voiding.
- The sterile technique is essential to maintain sterility of equipment and specimen. Sterile gloves prevent the transmission of microspecimen. A contaminated specimen is the most frequent reason for inaccurate reporting of urine cultures and sensitivities.

10. Pour antiseptic solution over cotton balls or gauze pads unless kit contains prepared gauze pads in antiseptic solution.

- Cotton balls or gauze pads will be used to further cleanse the perineum.

Continued

► SKILL 43-1 Collecting a Midstream (Clean-Voided) Urine Specimen—cont'd



11. Assist or allow patient to independently cleanse perineum and collect specimen:

A. Female patient

- (1) Spread labia with thumb and forefinger of nondominant hand.
- (2) Cleanse area with cotton ball or gauze, moving from front (above urethral orifice) to back (toward anus; see Step 11A(2) illustration). Using a fresh swab each time, repeat front to back motion three times (begin left side, then right side, then centre).
- (3) If agency policy indicates, rinse area with sterile water, and dry with cotton ball or gauze.
- (4) While you continue holding patient's labia apart, patient should initiate stream; after stream is achieved, pass container into stream and collect 30 to 60 mL (see Step 11A(4) illustration).

- Provides access to urethral meatus.
- Cleanse from area of least contamination to area of greatest contamination to decrease bacterial levels.
- Prevents contamination of specimen with antiseptic solution.
- Initial stream flushes out microorganisms that accumulate at the urethral meatus and prevents transfer into specimen.



Step 11A(2) Cleansing technique (female).



Step 11A(4) Specimen collection (female).

B. Male patient

- (1) Hold patient's penis with one hand; using circular motion and antiseptic swab, cleanse end of penis, moving from centre to outside (see Step 11B[1] illustration). In uncircumcised men, the foreskin should be retracted before cleansing.
- (2) If agency procedure indicates, rinse area with sterile water, and dry with cotton ball or gauze.
- (3) After patient has initiated urine stream, pass specimen collection container into stream and collect 30 to 60 mL (see Step 11B[3] illustration).

- Cleanse from area of least contamination to area of greatest contamination to decrease bacterial levels.
- Prevents contamination of specimen with antiseptic solution.
- Initial stream flushes out microorganisms that accumulate at the urethral meatus and prevents transfer into specimen.



Step 11B(1) Cleansing technique (male).



Step 11B(3) Specimen collection (male).

► SKILL 43-1 Collecting a Midstream (Clean-Voided) Urine Specimen—cont'd



12. Remove specimen container before flow of urine stops and before releasing labia or penis. Patient finishes voiding in bedpan or toilet. If foreskin was retracted for specimen collection, it must be replaced over the glans.
 13. Replace cap securely on specimen container (touch outside only).
 14. Cleanse any urine from exterior surface of container, and place in a plastic specimen bag.
 15. Remove bedpan (if applicable), assist patient to comfortable position, and provide handwashing basin if needed.
 16. Label specimen, and attach laboratory requisition.
- Prevents contamination of specimen with skin flora. If foreskin is not replaced, swelling and constriction may occur, causing pain and possible obstruction of urine flow.
 - Retains sterility of inside of container and prevents spillage of urine.
 - Prevents transfer of microorganisms to others.
 - Promotes relaxing environment.
 - Prevents inaccurate identification that could lead to errors in diagnosis or treatment.

Critical Decision Point: If patient is menstruating, indicate this information on the laboratory requisition.

17. Remove gloves, dispose of them in proper receptacle, and perform hand hygiene.
 18. Transport specimen to laboratory within 15 to 30 minutes or refrigerate immediately.
- Reduces transmission of infection.
 - Because bacteria grow quickly in urine, urine not received by the laboratory within 30 minutes should be refrigerated. However, refrigeration should not exceed two hours (Pagana & Pagana, 2007).

Unexpected Outcomes

Urine specimen is contaminated with feces or toilet paper

Specimen is accidentally discarded

Related Interventions

- Repeat instruction to patient or assist patient in obtaining a new specimen.
- Obtain a new specimen.
- Consider using a straight catheterization to obtain specimen.
- Repeat specimen collection.

Recording and Reporting

- Record date and time urine specimen was obtained in nurses' notes.
- Notify physician or nurse practitioner of any significant abnormalities.

Home Care Considerations

- If patient is required to collect specimen as an outpatient, a clean technique may be used. Provide proper instruction for collection.
- Appropriate equipment must be given to the patient and family.
- Information on storing the specimen until time of delivery to doctor's office or hospital laboratory must be provided.

certain portions of the urinalysis with special reagent strips. Dip the strip into the urine and observe for a colour change in the time interval designated on the package (Figure 43-10).

Specific Gravity. The **specific gravity** is the weight or degree of concentration of a substance compared with an equal amount of water. A urine specimen is poured into a special dry, clean cylinder. The weighted urinometer is suspended in the cylinder of urine. The concentration of dissolved substances in the urine aids in the determination of a patient's fluid balance. This measurement is always done as part of a complete urinalysis. If you are working in a critical care unit, you may be responsible for doing periodic measurement of specific gravity of urine as part of a complete assessment of specific patients.

If questions regarding the accuracy of specific gravity measurements arise, a urine osmolality test should be obtained. Although both tests measure urine concentration, the osmolality test is more accurate because it measures the total number of particles in a solution (see Chapter 39).

Urine Culture. For a urine culture, a sterile or clean-voided sample of urine is required. Early-morning specimens should be obtained when possible because bacterial counts are highest at that time (Fischbach, 2008). Because urine is an

excellent medium for bacterial growth and bacteriological changes may alter test results, facilities may require that urine samples for culture and sensitivity be stored in a refrigerator until pickup.

It will be approximately 24 to 48 hours before the laboratory can report findings of bacterial growth. While results are awaited, a broad-spectrum antibiotic may be ordered as soon as a culture has been obtained. The test for sensitivity determines which specific antibiotics are effective. The results of a urine culture may show that another antibiotic would be more effective. In this case, a new antibiotic is ordered.

Diagnostic Examinations

The urinary system is amenable to accurate diagnostic study by several radiographic techniques. The two approaches for visualization of urinary structures, direct and indirect techniques, can be quite simple or very complex, necessitating extensive nursing intervention. These procedures are further subdivided into invasive or noninvasive categories (Table 43-4). One noninvasive procedure involves computed tomography (CT), shown in Figure 43-11.

Many of the nursing responsibilities related to diagnostic examinations of the urinary tract are common to more than

▶ TABLE 43-3 Routine Urinalysis

**Measurement (Normal Value)****Routine Laboratory Value**

pH (4.6–8.0, average 6.0)

Protein (none or up to 8 mg/100 mL)

Glucose (none)

Ketones (none)

Blood (up to two red blood cells [RBCs])

Specific gravity (1.010–1.025)

Interpretation

pH indicates acid–base balance. Urine that stands for several hours becomes alkaline. An acid pH helps protect against bacterial growth.

Protein is not normally present in urine. It is seen in renal disease because damage to glomeruli or tubules allows protein to enter urine.

Diabetic patients have glucose in their urine as a result of inability of tubules to reabsorb high glucose concentrations (180 mg/100 mL). Ingestion of high concentrations of glucose may cause some glucose to appear in the urine of healthy people.

Patients whose diabetes mellitus is poorly controlled experience breakdown of fatty acids. Ketones are end products of fat metabolism. Patients with dehydration, starvation, or excessive aspirin usage also may have **ketonuria**.

Damage to glomeruli or tubules may allow RBCs to enter the urine. Trauma, disease, or surgery of the lower urinary tract also may cause blood to be present. In women, blood in a routine urine specimen may indicate contamination with menstrual fluid.

Specific gravity measures concentration of particles in urine. High specific gravity reflects concentrated urine, and low specific gravity reflects diluted urine. Dehydration, reduced renal blood flow, and increased antidiuretic hormone (ADH) secretion elevate specific gravity. Overhydration, early renal disease, and inadequate ADH secretion reduce specific gravity.

Microscopic Examination

White blood cells (WBCs) (0–4 per low-power field)

Bacteria (none)

Casts (none)

Greater numbers may indicate urinary tract infection (UTI).

Bacteria indicate UTI. (Patient may or may not have symptoms.)

Casts are cylindrical bodies whose shapes take on the likeness of objects within the renal tubule. Types include hyaline, WBCs, RBCs, granular cells, and epithelial cells. Their presence is always an abnormal finding and indicates renal alterations.

Data from Pagana, K. D., & Pagana, T. J. (2007). *Mosby's diagnostic and laboratory test reference* (8th ed.). St Louis, MO: Mosby.



Figure 43-10 Checking results of a chemical reagent strip dipped in urine.



Figure 43-11 Equipment for computed tomography. **Source:** From Brundage, D. J. (1992). *Renal disorders*. St Louis, MO: Mosby.

one type of procedure. Common responsibilities before an examination include the following:

- Witnessing a signed consent (if agency policy)
- Assessing the patient for history of shellfish (iodine) allergy, which predicts allergy to the dye used in specific studies (intravenous pyelogram [IVP] and renal arteriogram)
- Administering bowel-cleansing medications (check agency policy)
- Ensuring that the patient receives the appropriate pretest diet (clear liquids) or nothing by mouth (NPO), as needed

Common postprocedure interventions may include the following:

- Assessing intake and output
- Observing characteristics of urine (colour, clarity, presence of blood)

Patient Expectations

Patients depend on their caregivers to recognize and promptly meet their needs. Nurses need to use a skilled and caring approach, be creative in using a variety of assessment techniques, and serve as a patient advocate. A caring nurse will meet the patient's needs in a way that is acceptable and

► TABLE 43-4 Diagnostic Examinations

Name of Procedure	Purpose and Method of Procedure	Special Nursing Considerations
Noninvasive Procedures		
Abdominal roentgenogram(plain film; kidney, ureter, bladder [KUB], or flat plate)	To determine the size, shape, symmetry, and location of the kidneys; diagnose urinary calculi; preliminary X-ray imaging before intravenous pyelogram (IVP).	No special preparation or precautions; bowel preparation is required if preliminary X-ray imaging before IVP.
Computerized axial tomographic (CT) scan (see Figure 43-11)	A computerized X-ray procedure used to obtain detailed images of structures within a selected plane of the body. The computer reconstructs a cross-sectional image and thus allows the physician to view pathological conditions such as tumours and obstructions.	Bowel cleansing as per agency or physician preference. Assess patient for shellfish (iodine) allergy if a CT scan with contrast material is ordered. Prepare patient for the procedure (e.g., patient will be placed into a large machine and need to lie still, feelings of claustrophobia occur in some patients). Bowel cleansing will be completed as per agency or physician preference. Only clear liquids are permitted until after test is completed. Assess patient for shellfish (iodine) allergy before test. After test, fluid intake is encouraged to dilute and flush dye from patient. Observe for late symptoms of allergic reaction (rash, throat tightness, difficulty breathing, etc.). Same as for IVP.
Intravenous pyelogram (IVP)	To view the collecting ducts and renal pelvis and outline the ureters, bladder, and urethra with the use of dye, which is excreted through the urine. A special dye is injected intravenously. The patient's ability to empty the bladder is assessed through a postvoiding X-ray film.	Assess patient for shellfish (iodine) allergy before test. After test, fluid intake is encouraged to dilute and flush dye from patient. Observe for late symptoms of allergic reaction (rash, throat tightness, difficulty breathing, etc.). Same as for IVP.
Retrograde pyelogram	Series of X-ray films that provide detailed anatomical views of the ureter, ureteropelvic junction, renal pelvis, and calyces. A ureteral catheter is placed in the lower ureteral segment, and contrast material is injected or infused into the upper urinary tract.	Assess patient for shellfish (iodine) allergy before test.
Retrograde urethrogram (RUG)	To obtain oblique X-ray films of the male urethra by instilling a small volume of iodine-bound contrast material into the urethra from a retrograde direction.	Assess patient for shellfish (iodine) allergy before test.
Renal (kidney) scan	To determine renal blood flow, anatomical structure of the kidneys, and excretory function using a radioisotope.	Usually no bowel cleansing is needed, but check agency policy. After test, only precaution is rinsing bedpan or urinal after use and flushing the urine, as urine will contain a minute amount of radioisotope. Rinse fluid carefully using a double flush. No bowel cleansing is needed.
Renal ultrasonography	To identify gross renal structures and structural abnormalities in the kidney using high-frequency, inaudible sound waves.	No bowel cleansing is needed.
Bladder ultrasonography	To identify structural abnormalities of bladder or lower urinary tract. Also used to estimate the volume of urine in the bladder and to measure postvoid residual volume.	Patient may be asked to drink fluids before the ultrasonography to cause bladder distension for better results. To measure postvoid residual volume, ultrasonography should be performed within 15 minutes of void. No special care is necessary after either study.
Invasive Procedures		
Endoscopy	Use of an endoscope allows for direct visualization, specimen collection, or treatment of the interior of the kidney (nephroscopy), ureter (ureteroscopy), bladder (cystoscopy), and urethra (cystourethroscopy). Although this procedure may be accomplished using local anaesthesia, it is more commonly performed using general anaesthesia or conscious sedation to avoid unnecessary anxiety and trauma for the patient.	Signed consent is obtained. If ordered, a bowel cleansing is completed. Follow agency policy for preoperative preparation and checklist (see Chapter 48). After patient's return, assess the vital signs and the characteristics of urine, monitor intake and output, encourage ingestion of fluids, and observe for fever, dysuria, and pain in the suprapubic region.

Continued

► **TABLE 43-4** Diagnostic Examinations—cont'd

Name of Procedure	Purpose and Method of Procedure	Special Nursing Considerations
Arteriogram (angiography)	Used primarily to visualize the renal arteries or their branches to detect narrowing or occlusion. A catheter is placed in one of the femoral arteries and introduced up to the level of the renal arteries. Radiopaque contrast is injected through the catheter while X-ray images are taken in rapid succession.	Signed consent is required. Assess for shellfish (iodine) allergy. Follow agency preprocedure checklist. After the procedure, monitor vital signs frequently until stable; bed rest is maintained for prescribed time interval; fluids are encouraged to flush the contrast from the system. Also monitor the affected extremity for neurocirculatory function (pulse, skin temperature, sensation, and movement), and observe catheter site for bleeding, swelling, increased tenderness, or hematoma formation. Physician must be notified immediately of any postprocedure abnormality.
Urodynamic testing (cystometrogram)	Determines bladder and sphincter function in the case of urinary obstruction or urinary incontinence. A catheter is inserted, the urine is drained, and sterile water or contrast liquid is used to fill the bladder. Pressure readings are taken and compared with the patient's reported sensations.	Explain the need for the patient to report all sensations during the test. After the test, assess the patient for sensations of sweating, pain, nausea, bladder fullness, or a strong urge to void.

Adapted from Malarkey, L. M., & McMorrow, M. E. (2005). *Saunders' nursing guide to laboratory and diagnostic tests*. St Louis, MO: Saunders.

individualized to the patient and the family situation. Patients with alterations in urinary elimination expect you to be respectful of privacy needs and sensitive to the impact of urinary impairments on sexuality and self-concept. You and your patient should develop the care plan together whenever possible and establish goals that are mutually acceptable. Cultural practices and personal preferences also must be considered.

❖ Nursing Diagnosis

A thorough assessment of the patient's urinary elimination function reveals patterns of data that allow you to make relevant and accurate nursing diagnoses. The diagnosis may focus on a specific alteration or an associated problem such as impaired skin integrity related to urinary incontinence. Identification of defining characteristics leads you to select an appropriate diagnosis. Specifying related factors for each diagnosis allows selection of individualized nursing interventions (see Chapter 13). A sample of diagnostic reasoning is found in Box 43-3. Nursing diagnoses common to patients with alterations in urine elimination include the following:

- *Disturbed body image*
- *Pain (acute, chronic)*
- *Self-care deficit, toileting*
- *Impaired skin integrity*
- *Impaired urinary elimination*
- *Urinary incontinence (transient, urge, stress, mixed, functional, overflow, reflex, total)*
- *Urinary retention*

Common symptoms that contribute to a nursing diagnosis of impaired urinary elimination, such as frequency, urgency, and nocturia, were described in Table 43-1. Each of these symptoms is associated with multiple underlying disorders. You assimilate what has been learned from personal history taking, physical assessment, and diagnostic tests to determine a nursing diagnosis and an appropriate care plan.

► BOX 43-3 NURSING DIAGNOSTIC PROCESS

Assessment Activities	Defining Characteristics	Nursing Diagnosis
Have patient describe situations that accompany urine leakage.	Patient states that she "loses a little urine" whenever she sneezes, coughs, or laughs. Patient states that she has been having problems for several years.	<i>Stress urinary incontinence related to decreased pelvic muscle tone and urethral sphincter trauma</i>
Observe patient behaviour.	Patient is wearing a menstrual minipad continuously. Patient is reluctant to interact with others and tries not to cough or laugh.	
Review medical history.	Patient is menopausal after three vaginal births.	

❖ Planning

During planning, you need to integrate the knowledge gained from assessment and the knowledge related to resources and available therapies to develop an individualized care plan (Box 43-4). The patient's needs should be matched with clinical and professional standards recommended in the literature (Figure 43-12). Building a relationship of trust with the patient

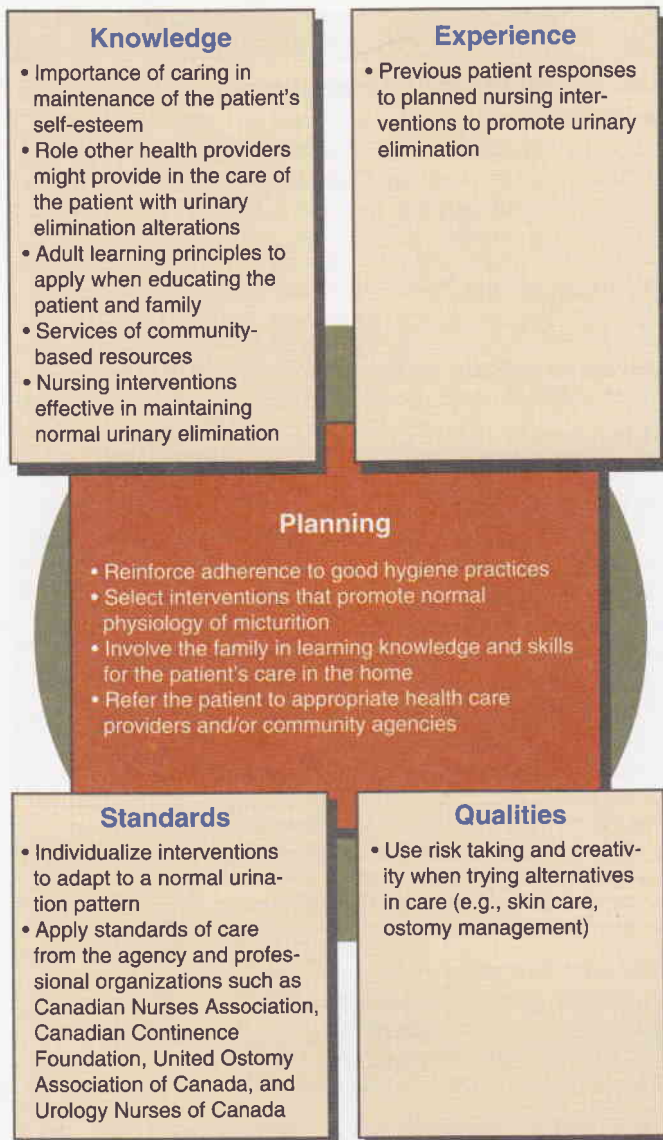


Figure 43-12 Critical thinking model for urinary elimination planning.

is important because implementing the care plan involves interaction of a very personal nature.

Goals and Outcomes

The care plan for alterations in urinary elimination must include realistic and individualized goals along with relevant outcomes. You and your patient must collaborate in setting goals and outcomes. A general goal might be normal urinary elimination, but the individual goal may differ depending on the problem. The goals may be short term or long term. For example, for a patient with urinary retention after surgery, the short-term goal may be "Patient will have normal voiding with complete bladder emptying within 24 hours." Relevant expected outcomes for this goal may include the following:

- Patient will void within eight hours.
- Urinary output of 300 mL or greater will occur with each voiding.
- Patient's bladder will not be distended on palpation.
- Patient will not continually feel an urge to void.

Conversely, the patient with stress incontinence may have a long-term goal that involves weeks of pelvic floor muscle exercise (PFMEs; also known as Kegel exercises) to achieve urinary control: "Patient will achieve improved urinary continence within 12 weeks after start of exercise program (Kegel)." Goals must be reasonably achievable for the patient and be relevant to the patient's situation.

Setting Priorities

Urinary elimination is a personal and intimate activity. You must establish a relationship with the patient that promotes open discussion. A supportive and collaborative environment allows the patient's priorities to become apparent and fosters mutual understanding of realistic goals.

When a patient has multiple nursing diagnoses (Figure 43-13), you must recognize the primary health problem and its influence on other problems. In the example of the patient with chronic confusion, the resultant incontinence creates several risks. Focusing on management of incontinence will often help to resolve more than one nursing diagnosis. Although physical care needs may appear to have higher priority, psychological needs related to self-esteem or sexuality may be of higher priority to the patient. Attention to the patient's

BOX 43-4 NURSING CARE PLAN

Mixed Urinary Incontinence

Assessment

Kay, a home care nurse, is seeing Mrs. Grayson, a 75-year-old widow, at her home. Mrs. Grayson was referred by her physician because of arthritis. She lives alone, but her daughter lives less than a 10-minute drive away. Kay's assessment included a discussion of Mrs. Grayson's current health problems.

Assessment Activities

Ask Mrs. Grayson about how she is coping with her arthritis.

Findings and Defining Characteristics

She responds, "It slows me down. The pain medication is helping, but it takes me longer to get out of my chair and get anywhere." Mrs. Grayson begins to cry and states, "You can see the plastic cover on my chair. I'm so embarrassed; sometimes I can't get out of the chair fast enough and I lose my water. I've been wearing those diapers lately."

Continued

► BOX 43-4 NURSING CARE PLAN—cont'd

Assessment Activities

Ask Mrs. Grayson to describe how long she has had trouble controlling her urine and whether she has ever sought help.

Ask Mrs. Grayson about any changes, such as new medication, that may have contributed to her worsening symptoms.

Ask Mrs. Grayson to complete a bladder diary for three days when she is likely to be at home most of the time, and provide a receptacle so that she can measure several of her voids. Establish diary format she understands and can work with.

Assess bladder diary findings and discuss patterns with Mrs. Grayson so she becomes aware of her usual bladder routines and is more able to participate in her care planning.

Findings and Defining Characteristics

Mrs. Grayson says that she has had trouble with dribbling for more than 10 years, but she really didn't think anything could be done about it because of her age. Over the past few years, it has gotten worse. With little warning, she has to rush to the bathroom and is often wet on the way.

Mrs. Grayson says that she has not started any new medications.

Mrs. Grayson completes the diary for only two days because she finds it difficult to write everything down.

The diary findings discussed are as follows:

1. Largest volume void is 200 mL and longest interval between voids is 1.25 hours. Mrs. Grayson is up three to four times at night to void.
2. Two episodes of incontinence occur on the way to the bathroom. Mrs. Grayson records that she gets a sudden urge to void but is "very wet" on the way to the bathroom.
3. Mrs. Grayson also records that she can feel herself dribbling while coughing.
4. Fluid intake is low, averaging 800 mL per 24 hours.

Nursing Diagnosis: *Mixed incontinence.* Mrs. Grayson has symptoms of urge incontinence: frequency, incontinence associated with severe urgency, and nocturia. She also describes episodes of stress incontinence. Her impaired mobility makes it more difficult to get to the bathroom in time. Mrs. Grayson also may be at risk for a urinary tract infection (UTI) due to reduced fluid intake.

Planning

Goals (Nursing Outcomes Classification)*

Patient will review bladder diary and think about aspects of her elimination pattern that may be amenable to change.

Patient will report reduced episodes of incontinence within one month and longer intervals between voids.

Patient will increase fluid intake to help ensure adequate hydration and prevent urinary tract infection.

Expected Outcomes

Enhanced understanding of bladder function

Reduced episodes of urinary incontinence

Adequate hydration

*Outcome classification labels from Moorhead, S., Johnson, M., Maas, M. L., & Swanson, E. (Eds.). (2008). *Nursing outcomes classification (NOC)* (4th ed.). St Louis, MO: Mosby.

Interventions (Nursing Interventions Classification)

Urinary Incontinence Care

Discuss "normal" bladder habits with patient as well as her actual patterns of intake and output, based on bladder diary.

Assess patient's pelvic floor strength digitally to establish baseline and to teach patient appropriate muscle to tighten. Instruct patient to practise PFMEs at least twice a day (see Box 43-12).

Work with patient to establish a manageable program of bladder training, asking the patient to void at regular, prespecified intervals throughout the day based on maximum intervals in bladder diary (1.25 hours). Gradually increase the interval by 15 to 30 minutes per week as tolerated, until acceptable pattern is achieved.

Rationale

The success of conservative therapies for urinary incontinence (UI) such as pelvic floor muscle exercises (PFMEs) requires motivation and ongoing commitment and self-care, meaning that the patient must be an active part of assessment and care planning.

Cognitively intact and motivated older adults can learn PFMEs when able to identify the correct musculature. Growing evidence supports the positive impact of PFMEs in women with stress UI and overactive bladder syndrome (OAB), including the reflex inhibition of involuntary detrusor contractions (Hay-Smith & Dumoulin, 2007).

Bladder training reduces frequency and urgency in women with OAB (Milne, 2008) but may be more successful when pelvic floor muscle strength has improved.

BOX 43-4 NURSING CARE PLAN—cont'd

Interventions (Nursing Interventions Classification)

Discuss safety issues related to the patient's nocturia and the possibility of acquiring a bedside commode.

Encourage patient to increase noncaffeinated fluid intake gradually to approximately 1500 mL, with fluid intake restricted to two hours before bedtime.

Rationale

Older adults who get up at night to urinate are more likely to experience a fall. Because older adults are also at increased risk for bone fractures, it is important to identify those with nocturia and to ensure that appropriate safety precautions are taken.

Adequate hydration will help prevent urinary tract infection (UTI) and maintain dilute urine. Avoiding fluids before bedtime may reduce nocturia.

Evaluation

Nursing Action

Ask Mrs. Grayson to complete a bladder diary at regular intervals (monthly or every two months) to compare to the baseline diary.

Patient Response and Finding

Three months after initiating conservative treatment, patient responds, "I'm dry most of the time now."

Achievement of Outcome

Mrs. Grayson has reduced her episodes of incontinence and increased the interval between voids. She is now voiding every three hours on average and is up one or two times at night. She reports that she feels better because she is getting more sleep.

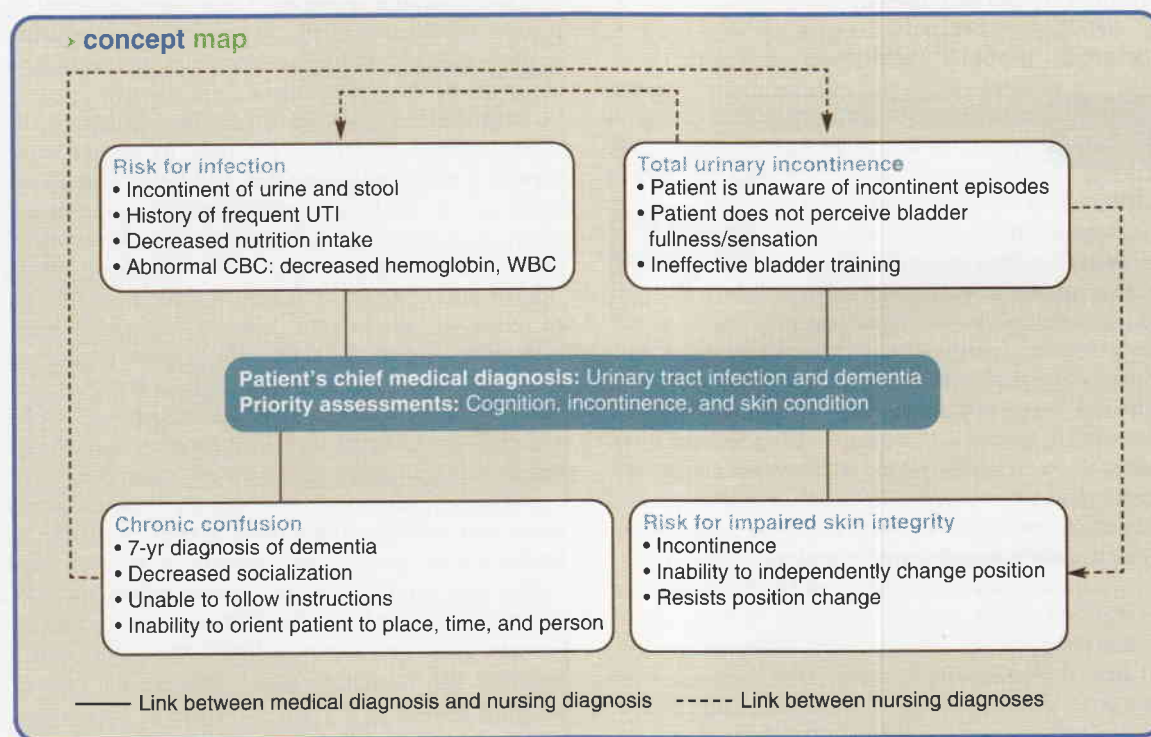


Figure 43-13 Concept map for patient with urinary tract infection (UTI) and dementia. CBC, Complete blood cell count; WBC, white blood cells.

perceived needs may be the most satisfactory and successful approach to accomplishing all of the goals. Reinforcement and praise of good health habits improve compliance with the care plan.

Continuity of Care

The care plan incorporates health promotion activities and therapeutic interventions for patients. Preventive interventions may be required for patients at risk for urinary problems. It is important to consider the patient's home environment and normal elimination routines when planning therapies. Consultation with other health care providers and with the patient's

family is often necessary. For example, the physiotherapist can design an exercise plan to increase strength and endurance so that the patient will be able to ambulate to the bathroom. The need for home care services should be explored and appropriate referrals made. The family may need to alter the home environment to make it easier and safer for the patient to use the bathroom.

Implementation

Implementation is the action phase of the nursing process. You will carry out the independent and collaborative activities

needed to assist the patient in achieving the desired outcomes and goals. Independent activities are those in which nurses use their own judgement. An example of these is teaching self-care activities to the patient. Collaborative activities are those prescribed by the physician that you carry out, such as medication administration.

Health Promotion

The focus of health promotion is to assist the patient in understanding and participating in self-care practices that will preserve and protect healthy urinary system function (Box 43-5). This can be achieved through several means.

Patient Education. Success of therapies aimed at solving or minimizing urinary elimination problems depends in part on successful patient education. Although many patients may need to learn about all aspects of urinary elimination, you should first focus the teaching on the patient's specific elimination problems. For example, patients who practise poor hygiene benefit most from learning about the normal sterility of the urinary tract and ways to prevent infection. Patients also learn the significance of symptoms of urinary alterations so that early preventive health care can be initiated.



BOX 43-5

FOCUS ON PRIMARY HEALTH CARE

Urinary Incontinence

People with urinary incontinence often attempt to manage the condition on their own and do not seek professional help because they are embarrassed, they believe that incontinence is a normal part of aging, or they are not aware of the treatment options. Consequently, routine screening for incontinence at the primary health care level should be the first level of assessment in provision of continence services. Such routine screening demonstrates that it is acceptable to discuss elimination problems and provides a forum for teaching about bladder health. Health promotion topics that should be taught include the following:

- Basic education about lower urinary tract function
- Education about promoting good bladder and bowel habits
- Education about risk factors, including smoking, caffeine, weight gain, and fluid restriction
- Education about preventing UTIs
- Providing information on resources

For patients already experiencing urinary incontinence, nurses at the primary health care level provide information about common causes, goals and expectations of treatment, and absorbent products available. You should communicate with other health care providers (particularly the patient's primary care provider) and be aware of how to access additional care at the secondary or tertiary levels. You should also be able to perform a focused assessment that includes obtaining relevant medical and surgical history, a focused physical examination, urinalysis by dipstick, and completion of a 24- to 72-hour bladder diary. You would then initiate behavioural interventions that are relevant to the nursing diagnosis

Sources: Adapted from Canadian Continence Foundation. (2001). *Promoting a collaborative consumer-focused approach to continence care in Canada*. Peterborough, ON: Author. Retrieved from <http://www.continence-fdn.ca>; and Gettliffe, K., & Thomas, S. (2007). Incontinence in perspective. In K. Gettliffe & M. Dolman (Eds.) *Promoting continence: A clinical and research resource* (3rd ed., pp. 1–23). Edinburgh: Bailliere-Tindall/Elsevier.

Nurses can easily incorporate teaching while providing nursing care. For example, when attempting to increase the patient's fluid intake, a good time to discuss the benefits of this action is while giving fluids with medications or meals. Teaching about perineal hygiene may be appropriate while giving a bath or performing catheter care.

Promoting Regular Micturition. Maintaining regular patterns of urinary elimination can help prevent many urination problems. Patients with urinary incontinence commonly void frequently throughout the day to avoid accidental urine loss. However, frequent voiding (e.g., at hourly intervals) may contribute to small-capacity bladders. Conversely, patients who hold their urine for long periods (more than eight hours) may develop a hypotonic bladder with incomplete emptying. You should reinforce the importance of voiding regularly (approximately every three to four hours) to help maintain a normal bladder capacity (400 to 500 mL). Because constipated stool in the rectum may compress the urethra and impede emptying, you should emphasize the importance of regular bowel movements and encourage measures to enhance regularity, including diets rich in fibre (see Chapter 44).

Many nursing measures have been designed to promote normal voiding in patients at risk for urination difficulties and in patients with established urination problems. You can initiate many of these measures independently.

Stimulating Micturition Reflex. The patient's ability to void depends on feeling the urge to urinate, being able to control the urethral sphincter, and being able to relax during voiding. You can help a patient learn to relax and stimulate the micturition reflex by enabling the patient to assume the normal position for voiding. A woman is better able to void in a squatting or sitting position. If the woman is unable to use toilet facilities, you can help her into a sitting position on a bedpan or bedside commode. A man voids more easily in a standing position. If the man cannot reach toilet facilities, he may stand at the bedside and void into a urinal (a metal or plastic receptacle for urine; Figure 43-14). At times, it may be necessary for one or more nurses to assist a man in standing.

Providing certain sensory stimuli also may promote relaxation and voiding. The sound of running water helps many patients void. Stroking the inner thigh may stimulate sensory nerves and promote the micturition reflex. You can also pour warm water over the patient's perineum to create the urge to urinate. If urine output is being measured, you must first measure the volume of water that will be poured over the perineal area.



Figure 43-14 Types of male urinals.

Maintaining Elimination Habits. Many patients follow routines to promote normal voiding. In a hospital or long-term care facility, nursing routines may conflict with those of patients. Integrating patients' habits into the care plan fosters normal voiding and will assist in preventing problems related to urination (Box 43-6).

Maintaining Adequate Fluid Intake. Patients with urinary incontinence often reduce fluid intake because they

believe that this will help keep them dry. In reality, maintaining an adequate fluid intake of 1500 to 2000 mL promotes continence because concentrated urine can irritate the bladder mucosa. Fluid intake should not include caffeinated beverages, which have a diuretic effect. Remind the patient that many vegetables and fruits have a high fluid content and can contribute to daily fluid intake. At the patient's home, it may be helpful to establish a schedule for drinking fluids (e.g., with meals or medications). Fluids should be avoided two hours before bedtime to minimize nocturia.

Avoiding Food and Fluids That Can Irritate the Bladder Mucosa. Teach the patient to avoid foods and fluids that may cause symptoms of urgency and frequency, including the following:

- Tobacco
- Alcohol
- Substances containing caffeine, such as coffee, tea, and chocolate
- Carbonated beverages
- Aspartame (artificial sweetener)
- Citrus fruits or juices
- Tomatoes or tomato-based products
- Greasy or spicy foods (Nygaard et al., 2008)

Promoting Complete Bladder Emptying. Under normal circumstances, a small amount of urine (50 mL) remains in the bladder after voiding (residual urine) because the urinary sphincters close. Thus, people normally remain continent and dry. People with residual urine are able to remain dry when their urethral closure pressure is sufficient to prevent leakage. However, urinary incontinence may occur when too much residual urine is in the bladder or when the urinary sphincters are too weak to maintain closure pressure. As well as contributing to incontinence, residual urine can be a medium for bacterial growth.

Patients should be encouraged to take their time while voiding and to try again when they feel they have not emptied their bladders fully. Those with consistently elevated postvoid residual volumes (>100 mL) may require intermittent catheterization. Portable bladder scanners offer a noninvasive means of assessing postvoid residual volumes.

Preventing Infection. One of the most important considerations for a patient with alterations in urinary elimination is the need to prevent infection of the urinary system. Good perineal hygiene that includes cleaning the urethral meatus after each voiding or bowel movement is essential. Patients with limited dexterity due to conditions such as arthritis or stroke can benefit from the use of a squirt bottle filled with warm water to rinse the perineum after defecation.

Maintaining an adequate daily intake of fluids (1500 to 2000 mL) dilutes urine and promotes regular micturition. Dehydration can contribute to urinary incontinence as concentrated urine can irritate the bladder (Wyman et al., 2009). Urine is normally acidic and tends to inhibit growth of microorganisms. Cranberry juice has been shown to lower urine pH and decrease bacterial adherence to the bladder wall (Jepson & Craig, 2008) and may be helpful in prevention of recurrent urinary tract infection in young to middle-aged women, but it has not been shown to be effective in children or people with in-dwelling catheters.

Acute Care

Many measures can be used in the acute care setting to decrease the incidence of urinary alterations. Box 43-7 lists

BOX 43-6 NURSING STORY

Motivated to Promote Continence

It is impossible to know how the seemingly isolated decisions we make now will continue to affect us. I had recently started working as a registered nurse in long-term care when the opportunity arose to enter the world of research. The proposed project would involve the assessment and treatment of 50 older adults with urinary incontinence. I knew as little about research as I did about incontinence, but my eyes were quickly opened. Interested residents and families lined the length of the hallway to attend the project's information session. What still stands out to me today is the fact that not one resident I spoke with that night had known before arriving at the facility that his or her urinary incontinence could be treated. The phrase "suffering in silence" had never been more true.

Assessment included much of what you are now familiar with—completing a bladder diary (by the resident or by a clinician as necessary), focused history, conducting blood work—and obtaining postvoid residual treatment was generally noninvasive: only one woman underwent surgery. The other participants initiated dietary modifications, bladder training, pelvic floor muscle exercises, or medication, or a combination of these. A regimen of prompted voiding was undertaken with residents who were cognitively impaired.

When assessment, intervention, and follow-up were complete approximately one year later, few of the 50 study participants were totally continent (i.e., dry). The majority, however, had at least 50% fewer episodes of incontinence. Of equal importance, these men and women understood that they were not alone and did not have to accept their incontinence as part of the aging process.

The differences that I witnessed in the participants' quality of life continue to motivate me in my work to this day. One resident who voided large volumes of urine each time she stood up, and who slept in her chair because she was afraid of soaking her bed, was able to leave the nursing home for the first time in years to visit with her brother before he died. Her treatment involved changing the medication that had contributed to her condition and ensuring that she had assistance to reach the toilet at appropriate times, as dictated by findings in her bladder diary.

On the down side, many of the participants' lifestyle improvements were not permanent. For a variety of reasons that included staffing shortages, supportive strategies such as prompted voiding and scheduled toileting were not well maintained after the project was completed, and several residents who required toileting assistance regressed despite earlier success. As a result of my participation, I was left with determination to teach those with urinary incontinence how to help themselves, and to teach caregivers that despite heavy workloads it is their ongoing responsibility to ask patients about urinary leakage, to direct them to the appropriate resources, and, above all, to ensure the dignity of those who are unable to help themselves by offering toileting assistance.

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► BOX 43-7

Urinary Incontinence Treatment Options

For Transient Incontinence

- Address underlying cause of incontinence (e.g., treat for infection or manage for constipation, as necessary)

For Urge Incontinence and Overactive Bladder

- Anticholinergic medications
- Bladder training
- Scheduled toileting
- Pelvic floor muscle exercises
- Biofeedback
- Lifestyle modifications (e.g., selected dietary and fluid modifications)

For Stress Incontinence

- Biofeedback
- Lifestyle modifications (e.g., weight loss, smoking cessation)
- Pessary
- Medications (i.e., estrogen replacement)
- Surgery
- Artificial sphincter

For Mixed Incontinence

- Interventions as for stress incontinence and urge incontinence

For Functional Incontinence

- Habit retraining
- Environmental alterations
- Scheduled toileting
- Condom catheter (men)
- Protective undergarments

For Overflow Incontinence

- Intermittent catheterization
- Surgery (i.e., for treatment of obstruction)
- Pessary for cystocele-related obstruction
- In-dwelling or condom catheter

For Reflex Incontinence

- Anticholinergic medications
- Surgery
- Intermittent catheterization
- In-dwelling or condom catheter

For Total Incontinence

- Artificial sphincter
- Surgery (e.g., sling procedure)
- Urinary diversion

some of the many types of interventions available for urinary incontinence.

Maintaining Elimination Habits. Patients usually require time to void. Requesting a urine specimen on demand does not contribute to relaxation and normal voiding habits. Patients should be given at least 30 minutes to provide a specimen. Patients normally void upon awakening or before meals; therefore, you should offer them the opportunity to use toilet facilities then. Also important is the need to respond promptly to patients' urges to urinate. Delays in assisting patients to the bathroom may interfere with normal micturition and contribute to incontinence. This is particularly the case with patients who have overactive bladders.

safety alert Many falls by older adults are related to the urge to urinate. Anticipate an older adult's need to urinate and provide scheduled bathroom visits. Make sure that the pathway between the bed and the toilet facility is clear of any barriers.

Privacy is essential to normal voiding. If the patient cannot reach the bathroom, make sure that the bedside curtain is closed. The debilitated patient at home may prefer to use a bedside commode screened by a partition or room divider. Young children are often unable to void in the presence of people other than their parents.

When possible, you should encourage the continued use of special measures that the patient uses to void. The patient may be able to relax and void more easily while reading or listening to music. Having a cup or glass of fluids also may promote urination.

Medications. Drug therapy, either alone or in combination with other therapies, can help problems of urinary incontinence and retention. The major categories of medication are presented in Table 43-5.

safety alert α -Adrenergic blockers may cause postural hypotension and increase the patient's risk of falling and injury. Instruct patients taking these medications to plan their nighttime toileting and to get out of bed slowly.

Catheterization. Catheterization of the bladder involves introducing a narrow tube through the urethra and into the bladder to allow a continuous flow of urine into a drainage receptacle. Indications for urethral catheterization are numerous in acute, community, and long-term care settings (Box 43-8). In acute care, catheterization is particularly useful for careful monitoring of output in hemodynamically unstable patients. Because bladder catheterization carries the risk of catheter-associated urinary tract infection (CAUTI), blockage, and trauma to the urethra, it is preferable to rely on other measures for either specimen collection or management of incontinence (Getliffe & Fader, 2007).

Types of Catheterization. Catheters may be intermittent or in-dwelling (retention). With the intermittent technique, a single-use straight catheter (Figure 43-15, A) is introduced for 5 to 10 minutes, just long enough to drain the bladder. The straight catheter has a single lumen with a small opening about 1.3 cm from the tip. Urine drains from the tip, through the lumen, and into a receptacle. Intermittent catheterization is performed by the patient or by a nurse and is common in patients who have incomplete bladder emptying due to neurogenic conditions (e.g., spinal cord injury). In hospital, intermittent catheterization is sterile to reduce the risk of nosocomial infections. In the community, patients use the clean intermittent catheterization technique and reuse their catheters many times. Catheters are washed with soap and water and left to air-dry until the next use. No evidence exists to confirm that UTIs are increased in people who use the clean technique rather than the sterile technique (Moore et al., 2007).

The coude catheter is a type of catheter that has a curved tip and is used for male patients who have enlarged prostates that partly obstruct the urethra. It is less traumatic during insertion because it is stiffer and easier to control than the straight-tip catheter.

An in-dwelling or Foley catheter (Figure 43-15, B) is retained for longer periods in the bladder by means of a small balloon that anchors it against the bladder neck. The catheter remains

► **TABLE 43-5** Medications Used to Treat Urinary Incontinence and Retention

Classification	Action	Generic Name	Side Effects	Contraindications Effects or Alerts/Comments
Urge incontinence: Anticholinergics or antimuscarinics	Anticholinergic/ antimuscarinic Inhibits effect of acetylcholine on smooth muscle antispasmodic	Oxybutynin Oxybutynin XL Tolterodine Tolterodine LA Fesoterodine Propiverine solifenacin	Constipation Dry mouth Blurred vision Confusion and decreased cognition in older adults Urinary retention	Narrow-angle glaucoma Gastrointestinal obstruction Ulcerative colitis Myasthenia gravis Retention elevated residual
Overflow incontinence from prostatic hyperplasia: α -Adrenergic blockers	Blocks α receptors to relax bladder neck or proximal urethra and reduce symptoms of obstructive voiding	Terazosin Doxazosin Tamsulosin	Postural hypotension Syncope fainting	Patients taking antihypertensives will require dosage titration
Overflow incontinence related to acute urinary retention: Cholinergic agents	Stimulates detrusor contraction	Bethanechol	May cause urethral resistance	Little effect in chronic urinary retention
Stress incontinence: α -Adrenergic agents	Stimulates α receptors at bladder neck or proximal urethra to increase tone and reduce stress incontinence	Pseudophedrine	Hypertension Insomnia Tremor Agitation	Monoamine oxidase inhibitors Hypertension Narrow-angle glaucoma Older patients
Stress or urge incontinence in women: Low-dose, topical hormone replacement therapy	Reduces irritation and atrophic vaginitis. Can reduce symptoms of overactive bladder and stress incontinence	Low-dose estrogen creams, tablets or rings	Sore breasts Spotting (rare with very low dose)	History of endometrial, ovarian, or breast cancer

Sources: Broyles, B., Reiss, B., & Evans, M. (2007). *Pharmacological aspects of nursing care* (7th ed.). Clifton Park, NY: Delmar Learning; Rigby, D. (2006). Medications for continence. In K. Getliffe & M. Dolman (Eds.) *Promoting continence: A clinical and research resource* (3rd ed., pp. 239–258). Edinburgh: Bailliere-Tindall/Elsevier; and Whytock, S. (2006). Transient causes of urinary incontinence. In P. Eyles (Ed.) *Promoting continence care: A bladder and bowel handbook for care provider* (pp. 33–34). Canadian Nurse Continence Advisor Association. Hamilton, ON: McMaster University Press.

► **BOX 43-8** Indications for Catheterization

Short-Term In-Dwelling Catheterization

- When urine outflow is obstructed (e.g., prostate enlargement)
- When bladder, urethra, and surrounding structures have been surgically repaired
- When seeking to prevent urethral obstruction from blood clots
- When measuring urinary output in critically ill patients
- When continuous or intermittent bladder irrigations are required

Long-Term In-Dwelling Catheterization

- When chronic urinary retention is not manageable by intermittent catheterization
- When skin rashes, ulcers, or wounds become irritated by contact with urine

- In those with a terminal illness when bed linen changes or toileting is painful

Intermittent Catheterization

- When seeking to relieve discomfort due to bladder distension, provision of decompression
- When required to obtain a sterile urine specimen
- When required to assess residual urine after urination
- When managing urethral strictures
- When engaging in the long-term management of patients with spinal cord injuries, neuromuscular degeneration, or incompetent bladders

in place until the patient is able to void completely and voluntarily or for as long as accurate measurements are needed. In-dwelling catheters are either two lumen (the most common type; one lumen drains urine and the other carries sterile water to inflate or deflate the balloon) or three lumen (the third lumen allows for irrigation). They can be used on a short-term or long-term basis.

Catheters are manufactured in many different materials (latex, silicone, Teflon) and come in many different diameters.

Guidelines on how to make appropriate decisions regarding catheter selection are provided in Box 43-9.

Catheter Insertion. For urethral catheterization of any type, a physician's order is required. You must use the strict aseptic technique (see Chapter 32). Organizing equipment before beginning the procedure prevents interruptions. The steps for inserting in-dwelling and single-use straight catheters are basically the same. The difference lies in the procedure taken to inflate the in-dwelling catheter balloon and secure the

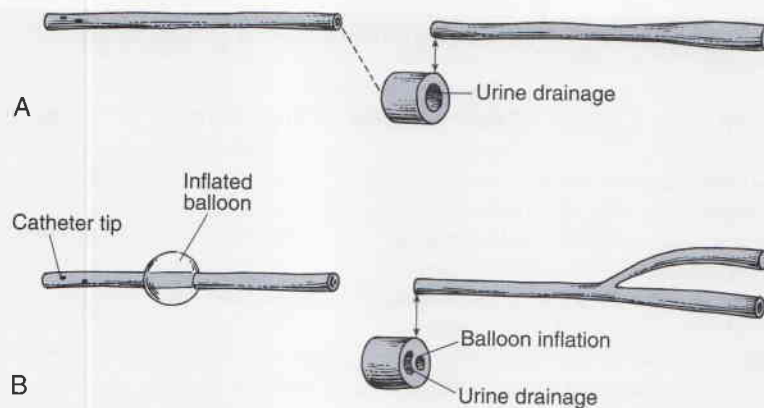


Figure 43-15 Types of urinary catheters. **A**, Straight catheter. **B**, In-dwelling (Foley) catheter.

► BOX 43-9 Guidelines for Appropriate Catheter Selection

- The catheter size should be determined by the size of the patient's urethral canal. When the French system is used, the larger the gauge number, the larger the catheter size. In general, an 8 to 10 Fr gauge is required for children, and a 14 to 16 Fr gauge is required for adults (Gray et al., 2006). The smallest effective catheter size is preferred to prevent trauma.
- After urological procedures (prostatectomy), a 20 to 24 Fr three-lumen catheter is used to allow clot drainage and irrigation.
- The expected time required for catheterization will determine the catheter material selection (Teflon- or silicone-coated latex, 100% silicone, hydrophilic-coated latex).
- Plastic catheters are suitable only for intermittent use because of their inflexibility.
- Latex and rubber catheters are recommended for use up to three weeks. Be aware of patient allergies to either of these materials.
- Pure silicone or Teflon catheters are best suited for long-term use (two to three months) because they cause less encrustation at the urethral meatus.
- Silicone catheters have larger interior lumens than those of other catheters of the same size and may allow for more efficient urine drainage.
- Hydrophilic-coated catheters may be more comfortable and less likely to inflame urethral tissue than are nonhydrophilic catheters; encrustation may develop more slowly (Gray, 2006).
- For patients who develop encrustations and blockages frequently, the use of an inexpensive catheter changed every 7 to 10 days (depending on their pattern of blockage) may be more economical.
- For short-term use, silver-hydrogel catheters and catheters with anti-infective surfaces are effective in delaying the onset of bacteriuria.
- Balloon size is also important to consider when selecting an indwelling catheter. Balloon sizes range from 3 mL (pediatric) to large postoperative volumes (30 mL). In adults, the 5 mL size allows for optimal drainage, whereas the 30 mL size is used after prostatectomies to provide hemostasis of the prostatic bed (Gray et al., 2006).
- Only sterile water should be used to inflate the balloon because saline may crystallize, resulting in incomplete deflation of the balloon at the time of removal.
- Urine leakage around the catheter may be due to bladder spasms secondary to constipation or fecal impaction, the use of a large catheter balloon (30 mL), the use of a large catheter (>18 Fr), the presence of the UTI, kinking of the catheter, or trauma at the bladder neck from traction on the balloon. A change in lumen size, the use of anticholinergic medication, or a referral to a urologist may be warranted.

catheter. Skill 43-2 lists the steps for inserting in-dwelling and single-use straight catheters in both men and women.

Closed Drainage Systems. After inserting an in-dwelling catheter, maintain a closed urinary drainage system to minimize the risk of infection. Urinary drainage bags are plastic and can hold about 1000 to 1500 mL of urine. The drainage bag should never be raised above the level of the patient's bladder. The bag should hang on the bed frame or wheelchair without touching the floor. Urine in the bag and tubing can become a medium for bacteria, and infection is likely to develop if urine flows back into the bladder. Therefore, do not hang the bag on the bed's side rails because in that location it can be raised above the level of the bladder accidentally. When the patient ambulates, the drainage bag must be held below the patient's waist.

If the catheter must be disconnected from the drainage tubing, both tips should be cleansed with an alcohol swab

before being reconnected to minimize the transfer of microorganisms into the tubing.

Most drainage bags contain an antireflux valve to prevent urine in the bag from re-entering the drainage tubing and contaminating the patient's bladder. A spigot at the base of the bag is used to empty the bag. The spigot should always be clamped, except during emptying, and tucked into the protective pouch on the side of the bag (see agency policy). To ensure that the drainage system remains unobstructed, check for kinks or bends in the tubing, avoid positioning the patient on the drainage tubing, and observe for clots or sediment that may occlude the collecting tubing.

Routine Catheter Care. Patients with in-dwelling catheters have a number of special care needs. Nursing measures are directed at maintaining patient comfort, preventing infection, and maintaining an unobstructed flow of urine.

Text continued on p. 1146

► SKILL 43-2 Inserting a Straight or In-Dwelling Catheter

Delegation Considerations

Catheterization is usually not delegated to unregulated care providers (UCPs). However, in some settings, agency policy may permit this skill to be delegated to UCPs who have been properly instructed. UCPs routinely assist with positioning the patient and maintaining patient privacy and comfort, empty urine from the collection bag, and provide perineal care. If using an UCP, instruct him or her to inform you of the following:

- Patient discomfort or fever
- Abnormal colour, odour, or amount of urine in drainage bag

Equipment

Catheterization kit containing the following sterile items:

- Gloves (extra pair optional)
- Drapes, one fenestrated
- Lubricant
- Antiseptic cleansing solution
- Cotton balls
- Forceps
- Prefilled syringe with sterile water to inflate the balloon of an indwelling catheter
- Catheter of correct size and type for procedure (i.e., intermittent or in-dwelling)
- Sterile drainage tubing with collection bag and multipurpose tube holder or tape, safety pin, and elastic band for securing tubing to bed if patient is bed bound (for an in-dwelling catheter)
- Receptacle or basin (usually bottom of catheterization tray)
- Specimen container
- Blanket

Procedure

STEPS

1. Review patient's medical record, including physician's order and nurses' notes.
2. Close bedside curtain or door.
3. Assess status of patient:
 - A. Ask patient when he or she last voided, or check intake and output flow sheet, or palpate bladder.
 - B. Level of awareness or developmental stage
 - C. Mobility and physical limitations of patient
 - D. Patient's gender and age
 - E. Distended bladder
 - F. Perform hand hygiene. Apply clean gloves. Inspect perineum for erythema, drainage, and odour.
 - G. Note any pathological condition that may impair passage of catheter (e.g., enlarged prostate in men).
 - H. Allergies
4. Assess patient's knowledge of the purpose for catheterization.
5. Explain procedure to patient.
6. Arrange for extra nursing personnel to assist as necessary.
7. Perform hand hygiene.
8. Raise bed to appropriate working height.
9. Facing patient, stand on left side of bed if right-handed (on right side of bed if left-handed). Clear the bedside table and arrange equipment.
10. Raise side rail on opposite side of bed, and lower side rail on working side.
11. Place waterproof pad under patient.
12. Position patient:
 - A. Female patient

RATIONALE

- Determines purpose of inserting catheter: preparation for surgery, urinary irrigations, collection of sterile specimens, measurement of residual urine, and size and style of catheter. Assess for previous catheterization, including catheter size, response of patient, and time of last catheterization.
- Offers privacy, reduces embarrassment, and aids in relaxation during procedure.
- Determines time of last voiding or potential for bladder fullness.
- Reveals the patient's ability to cooperate and the level of explanation needed.
- Affects the way that the patient is positioned.
- Determines catheter size: 8 to 10 Fr is generally used for children, 14 to 16 Fr is indicated for adults, 12 Fr may be considered for young girls.
- Causes pain. Can indicate need to insert catheter if patient is unable to void independently.
- Reduces infection. Determines condition of the perineum.
- Obstruction prevents passage of catheter through urethra into the bladder. Use of coude catheter may be required.
- Procedure risks exposure to antiseptic, tape, latex, and lubricant. Betadine allergies are common; if the patient is unaware of allergy, ask if allergic to shellfish.
- Reveals need for patient instruction.
- Promotes cooperation.
- Patient may be unable to assume positioning for procedure.
- Reduces transmission of microorganisms.
- Promotes use of proper body mechanics.
- To insert catheter successfully, you must assume a comfortable position with all equipment easily accessible.
- Promotes patient safety.
- Prevents soiling of bed linens.

Continued

► SKILL 43-2 Inserting a Straight or In-Dwelling Catheter—cont'd

- (1) Assist to dorsal recumbent position (supine with knees flexed). Ask patient to relax thighs so that the hips can be rotated externally.
- (2) Assist to side-lying (Sims') position with upper leg flexed at hip if unable to assume dorsal recumbent position. If this position is used, you must take extra precautions to cover rectal area with drape to reduce chance of cross-contamination.

B. Male patient

- (1) Assist to supine position with thighs slightly abducted.

13. Drape patient:

A. Female patient (see Step 13A illustration)

- (1) Drape with bath blanket. Place blanket in diamond fashion over patient, with one corner at patient's midsection, side corners over each thigh and abdomen, and last corner over perineum.

B. Male patient (see Step 13B illustration)

- (1) Drape upper trunk with bath blanket and cover lower extremities with bedsheets, exposing only genitalia.



Step 13A Draping technique (female).

- Provides good visualization of perineal structures. Support legs with pillows to reduce muscle tension and promote comfort.
- This alternative position is used if patient cannot abduct legs at hip joint (e.g., if patient has arthritic joints). Support patient with pillows if necessary to maintain position.
- Comfortable position for patient that aids in visualization.
- Avoids unnecessary exposure of body parts and maintains patient's comfort.



Step 13B Draping technique (male).

14. Wearing disposable gloves, wash perineal area with soap and water as needed; dry thoroughly. Remove and discard gloves; perform hand hygiene.
15. Position lamp to illuminate perineal area (have an assistant hold flashlight, if necessary).
16. Open package containing drainage system; place drainage bag over edge of bottom bed frame, and bring drainage tube up between side rails and mattress.

- Reduces microorganisms near urethral meatus and allows further opportunity to visualize perineum and landmarks.
- Permits accurate identification and good visualization of urethral meatus.
- Prepares system for eventual connection with catheter.

Critical Decision Point: This step is necessary only when an in-dwelling catheter is being inserted and a drainage system is not part of the catheterization kit.

17. Open catheterization kit according to directions, keeping bottom of container sterile.

- Prevents transmission of microorganisms from table or work area to sterile supplies. The materials in the kit are arranged in sequence of use.

► SKILL 43-2 Inserting a Straight or In-Dwelling Catheter—cont'd

18. Place plastic bag that contained kit within reach of work area to use as a waterproof bag to dispose of used supplies.
19. Apply sterile gloves (see Chapter 32).

- Allows you to handle sterile supplies without contamination.

Critical Decision Point: If underpad is the first item in the catheterization kit, place pad plastic side down under patient, touching only the edges so as to maintain sterility. Then apply sterile gloves.

20. Organize supplies on sterile field. Open inner sterile package containing catheter. Pour sterile antiseptic solution into correct compartment containing sterile cotton balls. Open packet containing lubricant. Remove specimen container (lid should be placed loosely on top) and prefilled syringe from collection compartment of tray, and set them aside on sterile field.

- Maintains principles of surgical asepsis and organizes work area.
- Note: Pretesting of balloon is no longer recommended because catheters are pretested during manufacturing and inflation may distort the balloon, leading to increased trauma (Smith, 2006).

21. Lubricate 2.5 to 5 cm of catheter for women and 12.5 to 17.7 cm for men.

- Makes insertion of the catheter easier by decreasing friction.

Critical Decision Point: Some catheters have plastic sheaths over them that must be removed before lubrication. In some cases, the physician may order local anaesthetic lubricant.

22. Apply sterile drape:

A. Female patient

- (1) Allow top edge of drape to form a cuff over both gloved hands. Place drape on bed between patient's thighs. Slip cuffed edge just under buttocks, taking care not to touch contaminated surface with gloves.
- (2) Pick up fenestrated sterile drape and allow it to unfold without touching any unsterile objects. Apply drape over perineum, exposing labia and being sure not to touch contaminated surface.

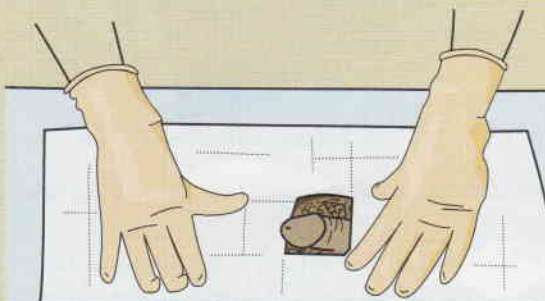
- Outer surface of drape covering hands remains sterile. Sterile drape against sterile gloves is sterile.

- Maintains sterility of work surface.

B. Male patient

- (1) Two methods are used for draping, depending on preference.
First method: Apply drape over thighs and under penis without completely opening fenestrated drape.
Second method: Apply drape over thighs just below penis. Pick up fenestrated sterile drape, allow it to unfold without touching any unsterile objects, and drape it over penis with fenestrated slit resting over penis (see Step 22B[1] illustration).

- Maintains sterility of work surface.



Step 22B(1) Draping male with fenestrated drape.

23. Place sterile tray and contents on sterile drape. Open specimen container.

- Provides easy access to supplies during catheter insertion. Maintains aseptic technique during procedure.

Continued

► SKILL 43-2 Inserting a Straight or In-Dwelling Catheter—cont'd

24. Cleanse urethral meatus:

A. Female patient

- (1) With nondominant hand, carefully retract labia to fully expose urethral meatus. Maintain position of nondominant hand throughout procedure.
- (2) Using forceps held in sterile dominant hand, pick up cotton ball saturated with antiseptic solution, and clean perineal area, microwiping from clitoris toward anus (front to back). Using a new cotton ball for each area, wipe along the far labial fold, near labial fold, and directly over centre of urethral meatus (see Step 24A[2] illustration).

- Full visualization of urethral meatus is provided. Full retraction prevents contamination of urethral meatus during cleansing.
- Cleansing reduces number of microorganisms at urethral meatus. Use of a single cotton ball for each wipe prevents transfer of microorganisms. Cleansing for each of the three areas proceeds from area of least contamination to that of most contamination. Dominant hand remains sterile.

Critical Decision Point: If the labia close during cleansing, then the cleansing procedure must be repeated because the area has become contaminated.

B. Male patient

- (1) If patient is not circumcised, retract foreskin with nondominant hand. Grasp penis at shaft just below glans. Retract urethral meatus between thumb and forefinger. Maintain nondominant hand in this position throughout procedure.
- (2) With sterile dominant hand, pick up cotton ball with forceps and clean penis. Move in a circular motion from urethral meatus down to base of glans. Repeat cleansing three more times, using a clean cotton ball each time (see Step 24B[2] illustration).

- If foreskin is accidentally released or if penis is dropped during cleansing, the process must be repeated because the area has become contaminated.
- Cleansing reduces number of microorganisms at urethral meatus and proceeds from area of least contamination to that of most contamination. Dominant hand remains sterile.



Step 24A(2) Cleansing technique (female).



Step 24B(2) Cleansing technique (male).

Critical Decision Point: If the foreskin does not remain retracted during cleansing, then the cleansing procedure must be repeated because the area has become contaminated.

25. Pick up catheter with gloved dominant hand, 7.5 to 10 cm from catheter tip. Hold end of catheter loosely coiled in palm of dominant hand. (Optional: May grasp catheter with forceps.)

- Use the dominant hand so that you can manipulate the catheter more readily. Place distal end of catheter in urine tray receptacle if straight catheterization is ordered.

► SKILL 43-2 Inserting a Straight or In-Dwelling Catheter—cont'd

26. Insert catheter:

A. Female patient

- (1) Ask patient to bear down gently as if voiding, and slowly insert catheter through urethral meatus (see Step 26A[1] illustration).

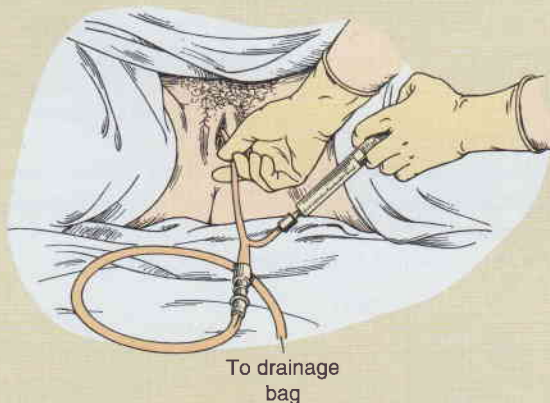
- Relaxation of urethral sphincter and pelvic floor muscle aids in insertion of catheter.



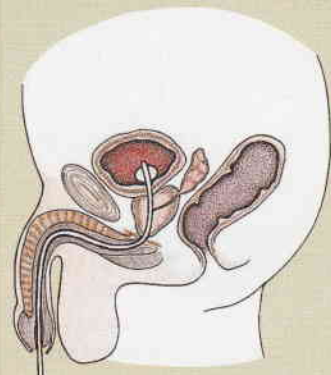
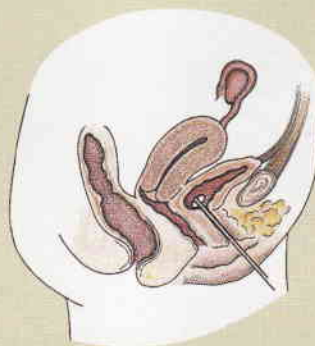
Step 26A(1) Inserting the catheter.

- (2) Advance catheter a total of 5 to 7.5 cm in adult female **or until urine flows out of catheter's end**. When urine appears, advance catheter another 2.5 to 5 cm. *Do not force against resistance.*
- (3) Release labia and hold catheter securely with nondominant hand. Slowly inflate balloon if in-dwelling catheter is being used (see Step 26A[3] illustrations; see Step 29).

- Female urethra is short. Appearance of urine indicates that the catheter tip is in bladder or lower urethra. Further advancement of catheter ensures bladder placement.
- Catheter may be expelled accidentally by bladder or sphincter contraction.



Step 26A(3) A, Inflating the balloon (in-dwelling catheter). B, Placement of inflated balloon in bladder.

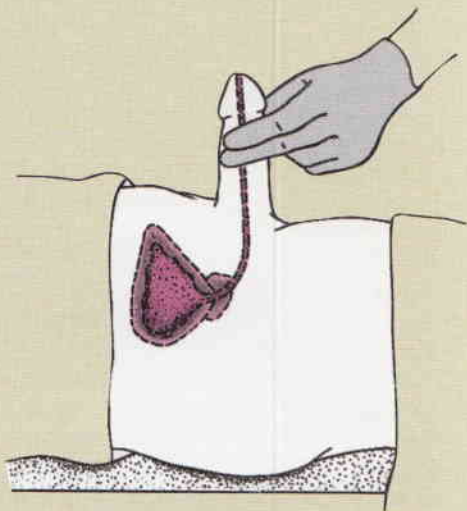


Critical Decision Point: If no urine appears, check whether catheter is in vagina. If misplaced, leave catheter in vagina as landmark indicating where not to insert, and insert another through urethral meatus.

Continued

> SKILL 43-2 Inserting a Straight or In-Dwelling Catheter—cont'd**B. Male patient**

- (1) Lift penis to position perpendicular to patient's body and apply light traction (see Step 26B[1] illustration).
- Straightens urethral canal to ease catheter insertion.

**Step 26B(1)** Position penis perpendicular to body for catheter insertion.

- (2) Ask patient to bear down as if voiding, and slowly insert catheter through urethral meatus.
 - (3) Advance catheter 17 to 22.5 cm in adult male or **until urine flows out of catheter's end**. If resistance is felt, withdraw catheter; do not force it through urethra. When urine appears, advance catheter another 2.5 to 5 cm. *Do not use force against resistance.*
 - (4) Lower penis and hold catheter securely in nondominant hand. Place end of catheter in urine tray. Inflate balloon if in-dwelling catheter is being used (see Step 29).
 - (5) Reduce (or reposition) the foreskin.
- Relaxation of urethral sphincter and pelvic floor muscle aids in insertion of catheter.
 - The adult male urethra is long. It is normal to meet resistance at the prostate. When resistance is felt, you should hold the catheter firmly without forcing it. After a few seconds, the muscle relaxes and the catheter is advanced. Appearance of urine indicates that the catheter tip is in bladder or urethra. Advancement of the catheter to the bifurcation ensures proper placement.
 - Catheter may be expelled accidentally by bladder or urethral contraction. Collection of urine prevents soiling and provides output measurement.
 - Paraphimosis (retraction and constriction of the foreskin behind the glans penis) secondary to catheterization may occur if foreskin is not reduced.
 - Allows sterile specimen to be obtained for culture analysis.
27. Collect urine specimen as needed. Fill specimen cup or jar to desired level (20 to 30 mL) by holding end of catheter over cup with your dominant hand.
 28. Allow bladder to empty fully (about 800 to 1000 mL) unless institution policy restricts maximal volume of urine to drain with each catheterization. Check institution policy before beginning catheterization.
- As always, you should monitor the patient's condition; if the vital signs change or bleeding occurs, temporarily stop the flow of urine and continue when the patient's condition warrants. Retained urine may serve as a reservoir for growth of microorganisms.

Critical Decision Point: If a single-use straight catheter was inserted, withdraw it slowly but smoothly until it is removed.

29. Inflate balloon fully per manufacturer's recommendation and then release catheter with nondominant hand and pull gently.
- Inflation of balloon anchors the catheter tip in place above the bladder outlet to prevent the catheter's removal. Note size of balloon on catheter. Most commonly, a 5 mL balloon is used, but a 30 mL balloon may be ordered in some cases. A prefilled syringe may be included with the kit. Use only the amount included. Do not overinflate the balloon. A 5 mL balloon should be inflated with the supplied amount (10 mL) to allow symmetrical expansion (Smith, 2006).

Critical Decision Point: If resistance to inflation is noted or if patient complains of pain, the balloon may not be entirely within the bladder. Stop inflation, aspirate the fluid injected into the balloon, and advance the catheter a little more before attempting to inflate the balloon again.

► SKILL 43-2 Inserting a Straight or In-Dwelling Catheter—cont'd

30. Attach end of in-dwelling catheter to collecting tube of drainage system. Drainage bag must be below level of bladder. Attach bag to bed frame; do not place bag on bed's side rails (see Step 30 illustration).



Step 30 Attach drainage to lower bed frame.

- In-dwelling catheters drain the bladder by gravity. Attaching to the bed frame prevents accidental pulling of the catheter when a bed rail is lowered.

31. Anchor catheter:

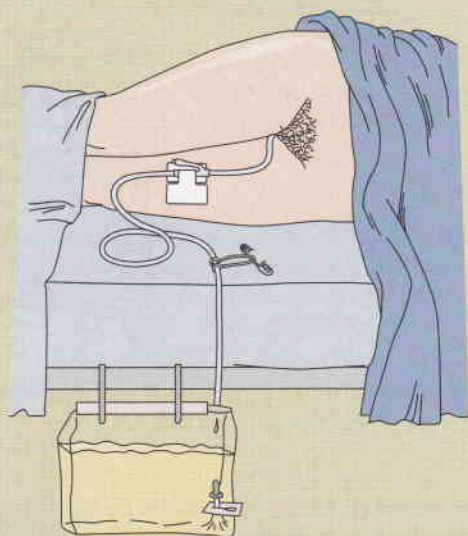
A. Female patient

- (1) Secure catheter tubing to inner thigh or abdomen with a strip of nonallergenic tape (or multipurpose tube holders with a Velcro strap). Allow for slack so that movement of thigh does not create tension on catheter (see Step 31A[1] illustration).

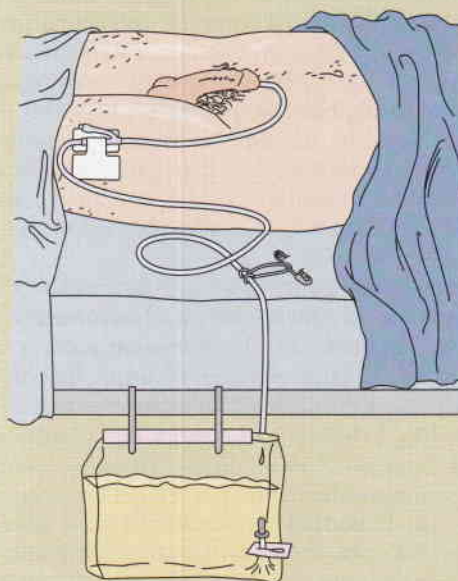
B. Male patient

- (1) Secure catheter tubing to top of thigh or lower abdomen (with penis directed toward chest). Allow for slack so that movement does not create tension on catheter (see Step 31B[1] illustration).

- Anchoring catheter to inner thigh reduces pressure on urethra, thus reducing possibility of tissue injury (Smith, 2006).
- Anchoring catheter to lower abdomen reduces pressure on urethra at junction of penis and scrotum, thus reducing possibility of tissue injury. Unsecured catheters may cause traction and pressure that leads to severe tissue erosion and damage to the urethral sphincter and urethra, particularly in males (Getliffe & Fader, 2007).



Step 31A(1) Tape catheter to inner thigh (female) and coil extra tubing on bed and attach to sheet. **Source:** From Sorrentino, S. A., Wilk, M. J., & Newmaster, R. (2008). *Mosby's Canadian textbook for the support worker* (2nd ed., p. 592, Figure 31-11A). Toronto: Elsevier.



Step 31B(1) Tape catheter to lower thigh (male) and coil extra tubing on bed and attach to sheet. **Source:** From Sorrentino, S. A., Wilk, M. J., & Newmaster, R. (2008). *Mosby's Canadian textbook for the support worker* (2nd ed., p. 592, Figure 31-11B). Toronto: Elsevier.

Continued

► SKILL 43-2 Inserting a Straight or In-Dwelling Catheter—cont'd

32. Assist patient to comfortable position. Wash and dry perineal area as needed.
 33. Remove gloves and dispose of equipment, drapes, and urine in proper receptacles.
 34. Perform hand hygiene.
 35. Palpate bladder.
 36. Ask about patient's comfort.
 37. Observe character and amount of urine in drainage system.
 38. Ensure that no urine is leaking from catheter or tubing connections.
- Maintains comfort and security.
 - Reduces transmission of microorganisms.
 - Reduces transmission of microorganisms.
 - Determines whether distension has been relieved.
 - Determines whether patient's sensation of discomfort or fullness has been relieved.
 - Determines whether urine is flowing adequately.
 - Prevents injury to patient's skin.

Unexpected Outcomes

Urethral or perineal irritation

Fever or odour, or small frequent voidings, burning sensations, or bleeding on voiding

Urinary retention and inability to void after catheter is removed

Related Interventions

- Observe for leaking catheter; replace if necessary.
- Assess whether in-dwelling catheter is anchored properly.
- Perform perineal hygiene and catheter care more frequently.
- Obtain a new sterile specimen from the catheter port.
- Notify physician.
- Provide adequate fluid intake and ensure patient privacy.
- If patient is unable to void six to eight hours after catheter removal, notify physician.

Recording and Reporting

- Report and record type and size of catheter inserted, amount of fluid used to inflate the balloon, characteristics of urine, amount of urine, reasons for catheterization, specimen collection if appropriate, and patient's response to procedure and teaching concepts.
- Initiate intake and output record.
- If catheter is definitely in bladder and no urine is produced within one hour, absence of urine should be reported to physician immediately.

Home Care Considerations

- Patients who are at home may use a leg bag during the day and switch to a large-volume bag at night so that sleep can be uninterrupted.
- Patients may catheterize themselves at home, using a clean technique.

Perineal Hygiene. Buildup of secretions or **encrustation** at the catheter insertion site is a source of irritation and potential infection. You should provide perineal hygiene (see Chapter 37) at least twice daily, after a bowel movement, or as needed for a patient with an in-dwelling catheter. Soap and water or skin cleansers are effective in reducing the number of microorganisms around the urethra and help to maintain skin health and patient comfort. Be careful not to accidentally advance the catheter upward into the bladder during cleansing; if you do, you risk introducing bacteria into the bladder.

Catheter Care. In addition to routine perineal hygiene, many institutions recommend that patients with catheters receive special care three times a day and after defecation or bowel incontinence to help minimize discomfort and infection (Skill 43-3).

Fluid Intake. All patients with catheters should have a daily fluids intake of 2000 to 2500 mL if permitted. This can be met through oral intake or intravenous infusion. A high fluid intake produces a large volume of urine that flushes the bladder and keeps the catheter tubing free of sediment.

Preventing Infection. The most important strategy in preventing the onset of infection is performing hand hygiene between patients. Maintaining a closed urinary drainage system is also important (Newman, 2007). A break in the system can lead to the introduction of microorganisms. Locations at risk are the site of catheter insertion, the drainage bag, the spigot, the tube junction, and the junction of the tube and the bag (Figure 43-16).

In addition, you should monitor the patency of the system to prevent pooling of urine within the tubing. Bacteria can

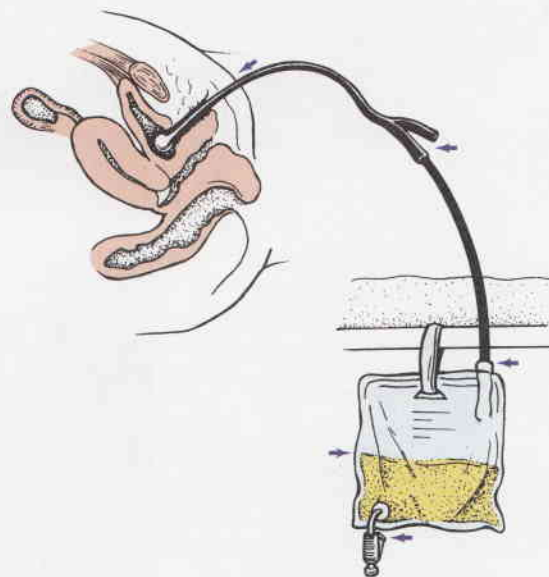


Figure 43-16 Potential sites for introduction of infectious organisms into a urinary drainage system.

travel up drainage tubing to grow in pools of urine. If this urine flows back into the patient's bladder, an infection will likely develop (Smith, 2006). Observe the patient for symptoms of UTI and document any changes in his or her condition. Suggested methods to prevent infections in catheterized patients are provided in Box 43-10.

► SKILL 43-3 In-Dwelling Catheter Care

Delegation Considerations

Perineal care is often part of routine hygiene care that is delegated to unregulated care providers (UCPs). Proper assessment and care of the perineal area requires professional clinical judgement. If the patient has had trauma or surgical procedures that involve the perineal area, care of this area should not be delegated.

- Instruct the UCP to report any patient discomfort, perineal pain, perineal discharge, or odour to a nurse. The UCP should also report on the condition of the catheter and drainage tubing (e.g., leaks, encrustations, or any discoloured or foul-smelling urine).

Procedure

STEPS

1. Assess for episode of bowel incontinence or patient discomfort or provide care as per agency routine regarding hygiene measures (see Chapter 37).
2. Explain procedure to patient. Offer the able patient an opportunity to perform self-care.
3. Close door or bedside curtain.
4. Perform hand hygiene.
5. Position patient.
 - A. Female patient
 - (1) Dorsal recumbent position
 - B. Male patient
 - (1) Supine or Fowler's position
6. Place waterproof pad under patient.
7. Drape bath blanket over patient so that only perineal area is exposed.
8. Apply gloves.
9. Remove anchor device to free catheter tubing.
10. With nondominant hand:
 - A. Female patient
 - (1) Gently retract labia to expose urethral meatus and catheter insertion site fully, maintaining position of hand throughout procedure.
 - B. Male patient
 - (1) Retract foreskin if not circumcised, and hold penis at shaft just below glans, maintaining position throughout procedure.
11. Assess urethral meatus and surrounding tissue for inflammation, swelling, and discharge. Note amount, colour, odour, and consistency of discharge. Ask patient if any burning or discomfort has been experienced.
12. Cleanse perineal tissue:
 - A. Female patient
 - (1) Use clean cloth and perineal cleanser. Cleanse around urethral meatus and catheter. Moving from pubis toward anus, clean labia minora. Use a clean side of the cloth for each wipe. Finally, clean around anus. Dry each area well.
 - B. Male patient
 - (1) While spreading urethral meatus, cleanse around catheter first, and then wipe in circular motion around meatus and glans.
13. Reassess urethral meatus for discharge.
14. While stabilizing the catheter with the nondominant hand, use a towel and perineal cleanser, to wipe in a circular motion along length of catheter for 10 cm.
15. In male patient, reduce (or reposition) the foreskin.
16. Reanchor catheter tubing.

Equipment

- Catheter care kit or individual supplies
- Disposable gloves
- Cotton balls or large swabs
- Clean washcloth and towel
- Warm water and soap
- Antibiotic ointment (if agency policy)
- Bath blanket
- Waterproof absorbent pad

RATIONALE

- Accumulation of secretions or feces causes irritation to perineal tissues and acts as a source of bacterial growth.
- Reduces anxiety and promotes cooperation. Embarrassment may motivate patient to perform own hygiene.
- Maintains patient privacy.
- Reduces transmission of infection.
- Ensures easy access to perineal tissues.
- Prevents soiling of bed linens.
- Prevents unnecessary exposure of body parts.
- Provides full visualization of urethral meatus. Full retraction prevents contamination of urethral meatus during cleansing.
- If foreskin is accidentally released or penis is dropped during cleansing, the process must be repeated because the area has become contaminated.
- Determines presence of local infection and status of hygiene.
- Reduces the number of microorganisms at the urethral meatus. Use of a clean cloth prevents transfer of microorganisms.
- Cleansing moves from area of least contamination to that of most contamination.
- Determines whether cleansing is complete.
- Reduces presence of secretions or drainage on exterior surface of catheter.
- Prevents trauma to the head of the penis.
- Prevents trauma to the urethra.

Continued

► SKILL 43-3 In-Dwelling Catheter Care—cont'd

17. Place patient in a safe, comfortable position.
 18. Dispose of contaminated supplies, remove gloves, and perform hand hygiene.
- Promotes comfort.
 - Prevents spread of infection.

Unexpected Outcomes

Urethral discharge

Related Interventions

- Increase frequency of in-dwelling catheter care.
- Apply topical antibiotic ointment per agency policy.
- Notify physician.
- Assess for urethral trauma.
- Monitor urine output.

Recording and Reporting

- Report and record the presence and characteristics of drainage, the condition of the perineal tissue, and any discomfort reported by the patient.
- If infection is suspected, report your findings to a physician.

Home Care Considerations

- If patient is discharged with an in-dwelling catheter in place, the patient and family should be taught catheter care as well as educated about the signs and symptoms that should be reported to a nurse or physician.

► BOX 43-10 Preventing Infection in Catheterized Patients

- Use appropriate hand-hygiene techniques (see Chapter 32).
- Do not allow the spigot on the drainage system to touch a contaminated surface.
- Use only the sterile technique to collect specimens from a closed drainage system.
- If the drainage tube becomes disconnected, wipe the ends of both the tubing and the catheter with an antimicrobial solution before reconnecting.
- Ensure that each patient has his or her own separate receptacle for measuring urine to prevent cross-contamination.
- Ensure that urine does not pool in the tubing and cause reflux of urine into the bladder.
- If it is necessary to raise the bag during transfer of the patient to a bed or stretcher, clamp the tubing until the transfer is complete.
- Ensure drainage of urine from the tubing to the bag by proper positioning of the tubing.
- Ensure that prolonged kinking or clamping of the tubing does not occur.
- Empty the drainage bag at least every eight hours and record output. If large outputs are noted, empty the bag more frequently.
- Encourage the patient to maintain fluid intake (if not contraindicated).
- Remove the catheter as soon as clinically warranted (Fernandez & Griffiths, 2006).
- Tape or secure the catheter appropriately for the patient (see Skill 43-2).
- Perform routine perineal hygiene per agency policy and after defecation or bowel incontinence (see Skill 43-3).

Catheter Irrigations and Instillations. To maintain patency of in-dwelling urinary catheters, at times you may need to irrigate or flush a catheter. Blood, pus, or sediment can collect within tubing and result in bladder distension and the buildup of stagnant urine. Instillation of a sterile solution ordered by the physician clears the tubing of accumulated material. For patients with bladder infections, a physician may

order antiseptic or antibiotic bladder irrigations to wash out the bladder or treat local infection. In both types of irrigation, the sterile aseptic technique is followed.

Before performing catheter irrigation, assess the catheter for blockage. If the amount of urine in the drainage bag is less than the patient's intake or less than the output during the previous shift, blockage can be expected. If urine does not drain freely, you may milk the tubing. Milking is done by gently squeezing and then releasing the drainage tube, starting from the patient's body and working toward the drainage bag so that a clot or sediment will not be forced back into the catheter.

Maintenance of a closed system is recommended during intermittent irrigations or instillations. This technique is effective for irrigating a partially blocked catheter or for bladder instillations. A single intermittent irrigation is safer and less likely to introduce infections into the urinary tract than repeated irrigations. Two additional methods for catheter irrigation exist. The first is a closed bladder irrigation system (Skill 43-4), which provides for frequent intermittent irrigations or continuous irrigation without disruption of the sterile catheter system through use of a three-way catheter. This method is used most often in patients who have had genitourinary surgery and are at risk for blood clots and mucous fragments occluding the catheter. The second system involves opening the closed drainage system to instill bladder irrigations (see Skill 43-4). This technique poses greater risk of infection. However, it may be needed when a catheter becomes blocked and it is undesirable to change the catheter (e.g., after recent bladder or prostate surgery).

Removal of In-Dwelling Catheter. When removing an in-dwelling catheter, you promote normal bladder function and prevent trauma to the urethra.

To remove a catheter, you need a clean, disposable towel; a discard receptacle; a sterile syringe that is the same size as the volume of solution within the catheter's inflated balloon; and disposable gloves. The end of the catheter contains a label that denotes the volume of solution (5 to 30 mL) within the balloon.

Assist the patient into the same position as during catheterization. Some institutions recommend collecting a sterile urine specimen at this time or sending the catheter tip for culture

► SKILL 43-4 Closed and Open Catheter Irrigation

Delegation Considerations

Although closed catheter irrigation poses less risk of infection, neither closed nor open catheter irrigation is usually delegated to unregulated care providers (UCPs). Catheter irrigation is usually done in patients with complications such as UTIs or after a prostatectomy.

- UCPs may assist with other aspects of patient care, such as positioning the patient and measuring intake and output.
- Instruct the UCP to report any complaints of pain, discomfort, or fever to a nurse.
- Instruct the UCP to report the presence of clots in the output or a change in output to a nurse.

Equipment

- When using the closed intermittent method:
 - Sterile irrigation solution at room temperature
 - Sterile graduated container
 - Sterile 30 to 50 mL syringe
 - Sterile 19- to 22-gauge 2.5 cm needle
 - Antiseptic swab
 - Clamp for catheter or tubing
 - Bath blanket
- When using the closed continuous method:
 - Sterile irrigation solution at room temperature
 - Irrigation tubing and clamp (with or without Y connector)
 - IV pole
 - Y connector (optional)
 - Antiseptic swab
 - Bath blanket
- When using the open method:
 - Sterile irrigation set with tray
 - Bulb syringe or 60 mL piston-type syringe
 - Sterile collection basin
 - Waterproof drape
 - Sterile solution container
 - Antiseptic swabs
 - Sterile gloves
 - Sterile correct irrigation solution at room temperature
 - Tape or elastic band to resecure catheter
 - Bath blanket

Procedure

STEPS

1. Assess physician's order for type of irrigation and irrigation solution to use.
2. Assess colour of urine and presence of mucus or sediment.
3. Determine type of catheter in place:
 - A. Triple lumen (one lumen to inflate balloon, one to instill irrigation solution, one to allow outflow of urine).
 - B. Double lumen (one lumen to inflate balloon, one to allow outflow of urine).
4. Determine patency of drainage tubing.
5. Assess amount of urine in drainage bag (may want to empty drainage bag before irrigation).
6. Explain procedure and purpose to patient.
7. Perform hand hygiene and apply disposable gloves for closed methods.
8. Provide privacy by pulling bed curtains closed. Fold back covers so that the catheter is exposed. Cover patient's upper torso with bath blanket.
9. Assess lower abdomen for bladder distension.
10. Position patient in dorsal recumbent or supine position.
11. *Closed intermittent irrigation (with double-lumen catheter):*
 - A. Prepare prescribed sterile solution in sterile graduated cup.
 - B. Draw sterile solution into syringe by using aseptic technique.

RATIONALE

- Ensures proper selection of equipment.
- Determines whether patient is bleeding, has infection, or is sloughing tissue.
- Triple lumen is for closed continuous irrigation.
- Double lumen is for closed intermittent or open irrigation.
- Ensures that drainage tubing is not kinked, clamped incorrectly, or looped.
- If drainage bag is not empty, you will need to subtract urine volume from the amount drained to determine whether all irrigant has returned.
- Helps patient relax and cooperate during procedure.
- Prevents transmission of microorganisms.
- Promotes patient comfort
- Detects whether catheter is malfunctioning or blocking urinary drainage.
- Promotes patient comfort and provides easy access to catheter.
- Ensures that irrigating fluid remains sterile.

Critical Decision Point: Avoid cold solution as irrigant because it may cause bladder spasm and discomfort.

- C. Clamp in-dwelling catheter just distal to soft injection (specimen) port.

- Occlusion of catheter provides resistance against which irrigant can be forcefully instilled into catheter.

Continued

► SKILL 43-4 Closed and Open Catheter Irrigation—cont'd

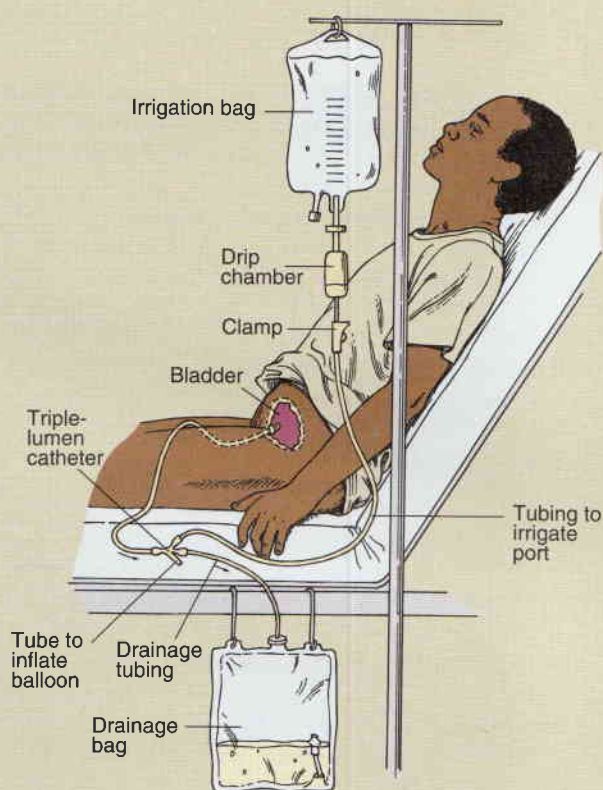
- D. Cleanse injection port with antiseptic swab (same port used for specimen collection).
 - Reduces transmission of infection.
- E. Insert needle of syringe through port at 30-degree angle toward bladder.
 - Ensures that needle tip enters lumen of catheter and flow is directed into bladder.
- F. Slowly inject fluid into catheter and bladder.
 - Slow, continuous pressure dislodges clots and sediment without traumatizing the bladder wall.

Critical Decision Point: If catheter does not irrigate easily, the tip may be incorrectly placed in the urethra and not in the bladder. Use slow pressure when injecting fluid. Too much pressure may traumatize the urethral or bladder wall.

- G. Withdraw syringe, remove clamp, and allow solution to drain into drainage bag. If ordered by physician, keep clamped to allow solution to remain in bladder for a short time (20 to 30 minutes).
 - Allows drainage by gravity.

Critical Decision Point: If solution is to remain in bladder, do not forget to unclamp tubing at the end of the instillation period.

12. Closed continuous irrigation (with triple-lumen catheter) (see Step 12 illustration).



Step 12 Closed continuous bladder irrigation.

- A. Using the aseptic technique, insert tip of sterile irrigation tubing into bag of sterile irrigating solution.
 - Prevents entrance of microorganisms.
- B. Close clamp on tubing and hang bag of solution on IV pole.
 - Removes air from tubing.
- C. Open clamp and allow solution to flow through tubing, keeping end of tubing sterile. Close clamp.
 - Third lumen or Y connector provides means for irrigation solution to enter bladder. System must remain sterile.
- D. Wipe off irrigation port of triple-lumen catheter, or attach sterile Y connector to double-lumen catheter and then attach to irrigation tubing.
 - Ensures that urine and irrigation solution will drain from bladder.
- E. Be sure that drainage bag and tubing are securely connected to the drainage port of triple-lumen catheter or other arm of Y connector.

► SKILL 43-4 Closed and Open Catheter Irrigation—cont'd

- F. For intermittent flow, clamp tubing on drainage system, open clamp on irrigation tubing, and allow prescribed amount of fluid to enter bladder (100 mL is normal for adults). Close irrigation clamp and then open drainage tubing clamp. (Optional: Leave clamp closed for 20 to 30 minutes if ordered. See previous critical decision point.)
 - G. For continuous drainage, calculate drip rate and adjust clamp on irrigation tubing accordingly. Be sure that clamp on drainage tubing is open and check volume of drainage in drainage bag. Ensure that drainage tubing is patent, and avoid kinks.
13. Open irrigation (with double-lumen catheter):
- A. Open sterile irrigation tray, establish sterile field, pour required volume of sterile solution into sterile container, and replace cap on large container of solution.
 - B. Apply sterile gloves.
 - C. Position sterile waterproof drape under catheter.
 - D. Aspirate 30 mL of solution into sterile irrigating syringe.
 - E. Move sterile collection close to patient's thighs.
- F. Disconnect catheter from drainage tubing, allowing urine from catheter to flow into collection basin. Allow urine in tubing to flow into drainage bag. Cover end of tubing with sterile protective cap. Position tubing in a safe place.
 - G. Insert tip of syringe into catheter lumen, and gently instill solution.
- Fluid instills through catheter into bladder, flushing system. Fluid drains out after irrigation is completed.
 - Ensures continuous, even irrigation of catheter system.
 - Prevents accumulation of solution in bladder, which may cause bladder distension and possible injury.
 - Adheres to principles of surgical asepsis (see Chapter 32).
 - Reduces transmission of infection.
 - Prevents soiling of bed linens.
 - Prepares irrigant for instillation into catheter.
 - Prevents soiling of bed linens and prohibits reaching over sterile field.
 - Maintains sterility of inner aspect of catheter and drainage tubing and reduces potential of introducing pathogens into bladder.
 - Gentle instillation reduces incidence of bladder spasm but clears catheter of obstruction.

Critical Decision Point: If resistance is noted, do not force the irrigation.

- H. Withdraw syringe, lower catheter, and allow solution to drain into basin. Repeat instillation until prescribed solution has been used or until drainage is clear (will depend on purpose of irrigation).
 - I. If solution does not return, have patient turn onto his or her side facing you. If changing position does not help, reinsert syringe and gently aspirate solution.
 - J. After irrigation is complete, remove protector cap from tubing, cleanse end with alcohol swab (or recommended agency solution), and re-establish drainage system.
14. Reanchor catheter to patient with tape or elastic tube holder.
15. Assist patient to comfortable position.
16. Lower bed to lowest position. Raise side rails if appropriate.
17. Dispose of contaminated supplies, remove gloves, and perform hand hygiene.
18. Calculate fluid used to irrigate bladder and catheter and subtract from total output.
19. Assess characteristics of output: viscosity, colour, and presence of matter (e.g., sediment, clots, blood).
- Allows drainage to flow by gravity. Provides for adequate flushing of catheter.
 - Change of position may move catheter tip in bladder, increasing likelihood that instilled fluid will flow out.
 - Reduces entrance of microorganisms into system.
 - Prevents trauma to urethral tissue.
 - Promotes relaxation and rest.
 - Promotes patient safety.
 - Prevents spread of infection.
 - Determines accurate urinary output.
 - Evaluates results of irrigation.

Unexpected Outcomes

Irrigating solution does not return or is not flowing at prescribed rate, possible occlusion of catheter

Cloudy or foul urine, fever

Increase in bladder spasms, possible occlusion of catheter with foreign object (e.g., blood clot)

Related Interventions

- Examine tubing for kinks, clots, or urine sediment.
- Notify physician if irrigant is retained, if patient complains of pain, or if bladder is distended.
- Monitor fever.
- Notify physician.
- Obtain sterile urine specimen if ordered by physician.
- Notify physician.
- May be instructed to perform intermittent irrigations until clots clear.

Continued

► SKILL 43-4 Closed and Open Catheter Irrigation—cont'd

Recording and Reporting

- Record type and amount of irrigation solution used, amount returned as drainage, and the character of drainage.
- Record and report any findings such as complaints of bladder spasms, inability to instill fluid into bladder, or presence of blood clots.

Home Care Considerations

- If patient is discharged with an in-dwelling catheter and requires bladder irrigations, either the patient or the patient's family must be properly instructed on how to perform this task.
- In the home, it is most likely that open irrigation will be required. Because this method poses the highest risk of contamination, you must assess the level of understanding of surgical asepsis by the patient and his or her family.

and sensitivity tests. After removing the tape that holds the catheter in place, put a towel between a female patient's thighs or over a male patient's thighs. Insert the syringe into the injection port. Most ports are self-sealing and require that only the tip of the syringe be inserted. Slowly withdraw all of the solution to deflate the catheter's balloon fully. If any solution remains, the partially inflated balloon will traumatize the urethral canal as the catheter is removed. After deflation, explain that the patient may feel a burning sensation as the catheter is withdrawn. Pull the catheter out smoothly and slowly.

It is normal for the patient to experience some dysuria, especially if the catheter was in place for several days or weeks. Until the bladder regains full tone, the patient also may experience urinary frequency or retention.

Assess the patient's urinary function by noting the first voiding after catheter removal and by documenting the time and amount of voiding during the next 24 hours. If amounts are small, frequent assessment of bladder distension is necessary. If eight hours elapse without voiding or if the patient experiences discomfort, it may become necessary to reinsert the catheter.

Alternatives to Urethral Catheterization. Two alternatives for urinary drainage can be used to avoid the risks associated with catheters inserted through the urethra: suprapubic catheterization and condom catheters.

Suprapubic Catheterization. Suprapubic catheterization involves surgical placement of a catheter through the abdominal wall above the symphysis pubis and into the urinary bladder. A physician performs the procedure under local or general anaesthesia. The catheter is anchored in place with sutures, a commercially prepared body seal, or both. Urine drains into a urinary drainage bag. Maintenance of the tubing and drainage bag is the same as for an in-dwelling catheter. The suprapubic catheter is relatively painless and reduces the incidence of infection commonly seen with in-dwelling catheters. Studies comparing the use of this method of urinary drainage have shown mixed results. While infection rates may be slightly lower, the long-term complications are similar (Doughty, 2006). Sediment, clots, encrustations, or the abdominal wall itself can block the suprapubic catheter. Adequate fluid intake will help minimize the risk of blockage by sediment or infection due to stagnation. The suprapubic catheter must remain patent at all times. You must monitor the patient's intake and output carefully, monitor the appearance of urine, and observe for signs of infection (e.g., fever and chills). You also should administer skin care around the insertion site.

Condom Catheters. The second alternative to catheterization is the condom catheter (external urinary catheter; Box

43-11), which may be suitable for incontinent or comatose men who still have complete and spontaneous bladder emptying. The condom is a soft, pliable, rubber sheath that slips over the penis. It may be worn at night only or continuously, depending on the patient's needs. One method used to secure the condom catheter involves a strip of elastic tape or rubber that encircles the top of the condom to hold it in place. An alternative is to use a self-adhesive condom sheath. Care must be taken to ensure that whatever type or size of condom is used, blood supply to the penis is not impaired. Standard adhesive tape should never be used to secure a condom catheter because this tape does not expand with changes in penis size and is painful to remove.

The end of the condom is attached to plastic drainage tubing that can be attached to the side of the bed or strapped to the patient's leg. The condom catheter itself poses little risk of infection. Infections usually result from buildup of secretions around the urethra, trauma to the urethral meatus, or buildup of pressure in the outflow tubing. Condom catheters must be applied and changed according to the manufacturers' directions to prevent abrasion, dermatitis, ischemia, necrosis, edema, and maceration of the penis. Frequent skin assessment is vital.

If the condom catheter is made of opaque material, you should remove it daily to check for skin irritation. Some new condom catheters are transparent, and the skin may be observed through them more easily. During each catheter change, thoroughly clean the urethral meatus and penis. The drainage tubing must be checked often for patency.

For a man with a retracted penis, maintaining a conventional condom catheter may prove difficult. Special devices are available to help alleviate this problem (Figure 43-17). Manufacturer's guidelines for product application should be consulted.

No collection devices for women are as effective as the condom catheter is for men; usually the only incontinence devices used are pads and protective clothing. To maintain the patient's dignity, pads and protective clothing should not be referred to as adult diapers, and they should be changed frequently to control odour. These devices should be used only temporarily to minimize or prevent episodes of incontinence while treatment is ongoing. Patients should be monitored frequently and good skin care should be provided to prevent irritation caused by urine.

Maintenance of Skin Integrity. Urine is irritating to skin and when in continuous contact with the skin becomes alkaline, causing dermatitis and skin breakdown. Continuous exposure of the perineal area or skin around an ostomy leads to gradual maceration and excoriation (see Chapter 46).

► BOX 43-11 Procedural Guideline

Condom Catheter

Delegation Considerations:

The application of a condom catheter can be delegated to unregulated care providers (UCPs). The registered nurse is responsible for assessing the condition of the penis over time and should inform the UCP to notify the registered nurse of any signs of skin irritation or tissue swelling.

Equipment:

- Condom catheter (may be self-adhesive or provided with elastic adhesive)
- Collection bag
- Basin with warm water
- Towel and washcloth
- Disposable gloves
- Scissors

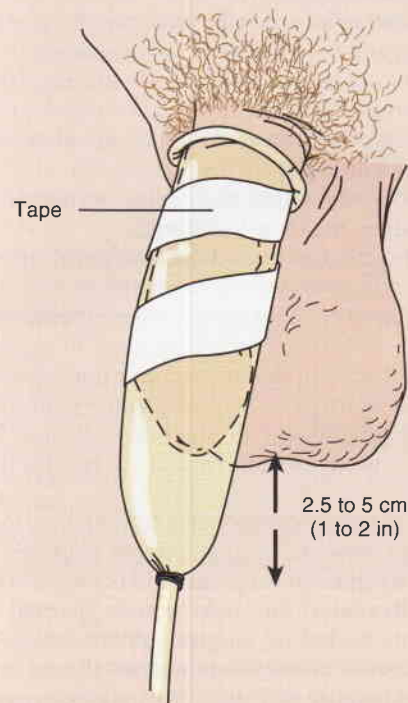
Procedure:

1. Check physician's order.
2. Perform hand hygiene.
3. Assess urinary elimination patterns, the patient's ability to urinate voluntarily, and continence.
4. Assess the patient's mental status to determine appropriate teaching related to condom catheter care.
5. Assess condition of penis and scrotum. Ensure that the foreskin of the uncircumcised male is not retracted.
6. Assess the patient's knowledge of the purpose of the condom catheter.
7. Explain procedure to patient.
8. Raise bed to working height and raise far upper side rail.



Step 13 Distance between end of penis and tip of catheter.

9. Using sheet, drape patient so that only genitals are exposed.
10. Prepare condom catheter and drainage system (see manufacturer's directions).
11. Apply gloves and provide perineal care.
 - A. If necessary, clip hair at base of penile shaft.
12. Apply skin preparation to penile shaft and allow to dry.
13. Holding penis in nondominant hand, apply condom by rolling smoothly onto penis. *Note:* Leave a 2.5 cm to 5 cm space between tip of penis and end of catheter (see Step 13 illustration)
14. Secure condom catheter:
 - A. If elastic adhesive is used, wrap the strip of adhesive over the condom catheter to secure it in place, using a spiral technique (see Step 14A illustration). *Note:* Adhesive tape must never be used.
 - B. If self-adhesive catheter is used, follow the manufacturer's directions.
15. Attach catheter to drainage bag and attach drainage bag to lower bed frame.
16. Make patient comfortable.
17. Observe urinary drainage, drainage tube patency, condition of penis, and tape placement.



Step 14A Elastic tape is applied in spiral fashion to secure the condom catheter to the penis.

Washing with pH-balanced soap and warm water is the best way to remove urine. Body lotion keeps skin moisturized, and petroleum-based ointments provide a barrier to urine. Patients who soil their clothing should receive partial baths and dry clothing and bed linens immediately after voiding. If the skin becomes irritated or inflamed, the physician may prescribe a cream or spray containing steroids to reduce inflammation. If fungal growth develops, the antifungal drug nystatin, available in cream or powder, is effective.

Promotion of Comfort. Patients with urinary alterations become uncomfortable as a result of the symptoms of urinary problems. Frequent or unpredictable voiding, dysuria, and painful distension are all sources of discomfort.

If the patient has local discomfort, a warm sitz bath may soothe inflamed tissues near the urethral meatus by improving blood supply. The patient is often relaxed after a sitz bath, and voiding occurs easily. Pain due to distension cannot be relieved unless the patient is able to empty the bladder. Interventions



Figure 43-17 Retracted penis pouch external urinary device.

that stimulate micturition or intermittent catheterization may be the only sources of pain relief.

Conservative Therapies to Restore Bladder Control and Promote Continence

The following therapies can help incontinent patients of all ages to maintain and regain control over urination:

- Pelvic floor muscle exercises to strengthen the pelvic floor
- Initiating a voiding schedule
- Using methods to initiate voiding (e.g., running water and stroking the inner thigh)
- Using relaxation techniques to aid complete bladder emptying (e.g., reading and deep breathing)
- Never ignoring the urge to void (if urinary problem involves infrequent voidings that result in retention)
- Minimizing ingestion of tea, coffee, other caffeinated drinks, and alcohol
- Taking prescribed diuretic medication or fluids that increase diuresis (such as tea or coffee) early in the morning
- Progressively lengthening or shortening periods between voiding as appropriate for control of specific cause of incontinence
- Offering protective undergarments to contain urine and to reduce the patient's embarrassment (not diapers)
- Following a weight-control program if obesity is a problem

Numerous therapies can help restore normal urinary voiding function, including surgical, pharmacological, and behavioural options. Conservative therapies should be the first line of treatment because they generally are noninvasive, have few side effects, and are feasible for older as well as younger adults (Box 43-12). Conservative therapies include lifestyle modification, pelvic floor muscle exercises, bladder training, habit retraining, and prompted voiding (RNAO, 2005). Because the success of all these therapies necessitates changes in daily lifestyle and ongoing adherence, it is important that you provide support and follow-up to enhance motivation. If conservative therapies do not eliminate the urinary alteration, then self-catheterization may restore a measure of control to the patient.

Lifestyle Modification. Several lifestyle factors have been associated with urinary incontinence. Smoking has been associated with increased risk of incontinence, likely due to the chronic cough experienced by smokers (Chung & Pavord,

* BOX 43-12 RESEARCH HIGHLIGHT

Promoting Conservative Therapies for Older Adults

Research Focus

The incidence of urinary incontinence rises with age, affecting 30% to 40% of middle-aged women and 30% to 50% of older women. The least invasive treatments are recommended as the first line of therapy, yet little is known about how older women tolerate therapies such as pelvic floor muscle exercises and bladder training. It is possible that ageist attitudes, including a belief that incontinence is a normal part of aging and that older adults are not able to learn and apply new therapies at home, continue to affect the ability of older adults to obtain appropriate care.

Research Abstract

The purpose of Perrin et al.'s (2006) study was to determine the feasibility of conservative therapies, including pelvic floor muscle exercises with biofeedback and bladder training, to treat urinary incontinence in older women. A group of 10 women (cognitively intact and older than 75 years) who were attending a urology clinic or were on the waiting list for incontinence surgery participated. Before the intervention, the women learned how to complete a 72-hour bladder diary and a 24-hour pad test. They then met with a physiotherapist at the clinic six times, over a period of six to nine weeks. All received a combined approach of bladder training and pelvic floor muscle exercises with biofeedback included as a learning tool. The women were asked to carry out the exercise program three times each day at home and to record their progress.

Three women did not complete the study, one because of the demands of the study and two because of comorbidities. All seven women who completed the program said that they were comfortable with the intervention. Although some thought the exercises were difficult at first, they improved their techniques with practice. Most were also comfortable with the manual vaginal examination and the use of the vaginal probe. Some noted difficulty with completing the bladder diary, but a 95% compliance rate was reported. Three of the seven women completed the home therapy program three times a day as advised; the other four were compliant 67.5% of the time. Episodes of leakage decreased by 39%, a decrease that correlated with an improvement in reported quality of life. All of the women reported that they would recommend the treatment to a friend. The researchers concluded that physical therapies and even biofeedback with vaginal probes are feasible in women older than 75 years.

Evidence-Informed Practice

- Incontinence, frequency, or both, are experienced by adults of all ages, educational levels, economic status, and health status.
- Many adults wrongly believe that urinary incontinence and frequency are an expected part of the aging process.
- The use of biofeedback and conservative therapies is generally well tolerated by older adults.
- Nurses can support the use of conservative, inexpensive nonpharmacological interventions to enhance comfort in community-based and some institutionalized older adults.

Reference: Perrin, L., Dauphinee, S., Corcos, J., Hanley, J., & Kuchel, G. (2006). Pelvic floor muscle training with biofeedback and bladder training in elderly women. *Journal of Wound, Ostomy, and Continence Nursing*, 32(3), 186–199.

2008). Extra weight, particularly in obese and moderately obese individuals, is believed to increase intrapelvic pressure; in one study, women who lost an average of 15 kg experienced a 51% reduction in incontinent episodes (Hunnskaar, 2008).

Caffeine contributes to urinary incontinence as it has a diuretic action and irritant effect (Cassel & Skelly, 2006). You can play an important role in educating, counselling, and supporting the patient to enable lifestyle modification that reduces the risk factors for incontinence.

Pelvic Floor Muscle Exercises. The pelvic floor musculature (PFM) spans the opening in the bony pelvis and combines with connective tissue to provide structural support for the pelvic organs. A well-toned PFM maintains the bladder neck in position to ensure that any increase in intra-abdominal pressure, as occurs with coughing, is transmitted not only to the bladder but also to the bladder neck to maintain closure. Contraction of the PFM results in urethral compression as the urethra is pulled forward toward the symphysis pubis (Ashton-Miller & Delancey, 2007). Weakened PFMs can result from muscle wasting caused by prolonged immobility, frequent straining in association with urinary or fecal elimination, stretching of muscles during childbirth, menopausal muscle atrophy, or traumatic damage.

Pelvic floor muscle exercises (PFMEs), also known as **Kegel exercises**, improve the strength of PFMs through hypertrophy and recruitment of additional muscle fibres associated with repetitive contractions (Ashton-Miller & DeLancey, 2007). These exercises have demonstrated effectiveness in treating stress incontinence, overactive bladders, and mixed causes of urinary incontinence (Dolman, 2007). Patients begin these exercises during voiding to learn the technique: if they are able to slow the urinary stream, they are contracting the proper muscles. The exercises are then practised at nonvoiding times (Box 43-13). Patients should be alert and motivated to perform the exercises. They also should be aware that it may take 12 to 16 weeks to notice appreciable change, but that maintaining the exercises is important to obtain a positive outcome.

Bladder Training. The goal of bladder training is to increase gradually the interval between voids and to decrease voiding frequency (Eustice, 2007). The overall purpose is to restore a normal pattern of voiding. For bladder training to be successful, patients must be alert, motivated, and physically able to follow a training program. The program includes education, scheduled voiding, and positive reinforcement.

The first step in bladder training is establishing a baseline. The patient or caregiver completes a urinary diary to assess maximum voiding intervals. It is not uncommon for the patient with frequency or an overactive bladder to void small amounts hourly or more often. An initial training schedule for such a patient might involve a voiding schedule of every 75 minutes while awake, increasing every one to three weeks by 15-minute increments toward a three-hour schedule. The rate of incremental changes will depend on the patient's progress and on his or her ability to adhere to a rigid schedule. Urge-suppression techniques, such as counting backward from 100 when the urge to void is felt and performing pelvic floor muscle contractions, are helpful. You must be aware that the patient who has experienced an episode of incontinence in public will be particularly hesitant to deter voiding for even brief periods.

Habit Retraining and Prompted Voiding. Habit retraining and prompted voiding are useful strategies for patients with cognitive or physical impairment, or both, who rely on caregiver assistance. Habit retraining involves

BOX 43-13 PATIENT TEACHING

Pelvic Floor Muscle Exercises (Kegels)

Objectives

The patient who is cognitively alert and motivated will achieve continence or experience fewer episodes of incontinence as a result of increased pelvic floor muscle tone and strength.

Teaching Strategies

- Explain the method used to identify proper muscle contraction: female patient sits on the toilet with knees apart and tightens muscles to stop the flow of urine; a male patient tries to stop the flow of urine midstream.
- After muscle is identified, instruct the patient to lie down with knees bent and apart, or to sit.
- Instruct the patient to contract the pelvic floor muscle gradually and hold the contraction for 3 to 10 seconds without tensing the muscles of the legs, buttocks, back, or abdomen. Remind the patient to breathe during the exercise.
- Instruct the patient to relax the muscle gradually for an equal time period between each contraction.
- The patient should repeat this exercise at least two or three times, and work up to 10 repetitions as it becomes easier. The patient should do this exercise two or three times a day, or as often as possible.
- Explain that within the first week of exercises, the patient and nurse can assess whether proper muscle contraction is occurring by patient placing two fingers in the vagina (or, for men, one finger in rectum) while contracting the pelvic floor muscle. The patient should feel tightening in the vagina or anus during the contraction.
- Teach the patient and the caregiver to keep a 24- to 72-hour urinary diary to identify changes in patterns of urinary elimination.

Evaluation

- Ask the patient if he or she has identified the pelvic floor muscle by finger insertion (into the vagina or rectum).
- During vaginal or rectal (male) bimanual examination, ask the patient to perform the exercises, then assess muscle tone.
- Monitor the patient's urinary diary.
- Ask the patient and the caregiver about degree of satisfaction related to the control achieved over urinary elimination.



assessment of a patient's normal pattern of voiding to establish a toileting schedule that preempts incontinence (Ostaszkie-wicz et al., 2008). Such individualized toileting schedules have demonstrated effectiveness but are labour intensive. You should help the patient to the bathroom before episodes of incontinence occur. Fluids and medications are timed to prevent interference with the toileting schedule. When combined with positive reinforcement, this approach is also called prompted voiding (Box 43-14).

Self-Catheterization. Some patients with chronic disorders such as spinal cord injury learn to perform self-catheterization. The patient must be physically able to manipulate equipment and assume a position for successful catheterization. You must teach the patient the structure of the urinary tract, the clean versus sterile technique, the importance of adequate fluid intake, and the frequency of

* BOX 43-14

EVIDENCE-INFORMED
PRACTICE GUIDELINE**Prompted Voiding for People With Urinary Incontinence**

- Approach the patient at scheduled prompted voiding times.
- Wait five seconds for the patient to initiate a request to toilet.
- Ask the patient if he or she is wet or dry.
- Physically assess the patient to determine continence status.
- Provide positive feedback if the patient is dry.
- Prompt the patient to toilet.
- Offer assistance with toileting.
- Provide feedback.
- Inform the patient of the next scheduled prompted voiding session.
- Encourage the patient to self-initiate requests to toilet.
- Record the result of the prompted voiding session.



Source: Adapted from Wyman, J. (2008). Prompted voiding. In B. Ackley, B. Swan, G. Ludwig, & S. Tucker (Eds.), *Evidence-based nursing care guidelines: Medical-surgical interventions* (pp. 696–698). St Louis, MO: Mosby.

self-catheterization. In general, the goal is to have patients perform self-catheterization every six to eight hours, but the schedule should be individualized.

❖ **Evaluation****Patient Care**

The patient is the best source of evaluation of outcomes and responses to nursing care (Figure 43-18). However, you will also evaluate the effectiveness of nursing interventions through comparisons with baseline data. You should evaluate for changes in the patient's voiding pattern, the presence of urinary tract alteration, and the patient's physical condition. Actual outcomes are compared with expected outcomes to determine the patient's health status. Continuous evaluation allows you to determine whether new or revised therapies are required or if any new nursing diagnoses have developed.

Patient Expectations

If you have developed a trust relationship with the patient, indications of the patient's degree of satisfaction with his or her care will be evident. The patient may smile or nod in appreciation. However, you need to confirm whether the patient's expectations have been met to full satisfaction. You may need to ask specifically about the patient's degree of urinary control and comfort. If simply asked, "How are you feeling today?" the patient may reply with a noncommittal "Okay." However, you need specific information about how well an intervention has met the patient's need in order to continue or to revise the care plan. You can also assist the patient in redefining unrealistic expectations when impairment in function is not likely to be altered as completely as he or she might like.

❖ **KEY CONCEPTS**

- The act of micturition, or voiding, is influenced by voluntary control from higher brain centres and involuntary control from the spinal cord.

Knowledge

- Clinical signs of normal micturition
- Characteristics of normal urine
- Behaviours that demonstrate learning

Experience

- Previous patient responses to planned nursing interventions to promote urinary elimination

Evaluation

- Reassess the patient's urination pattern and signs and symptoms of alterations
- Inspect the character of the patient's urine
- Have the patient and family demonstrate any self-care skills
- Have the patient discuss feelings regarding any permanent changes in elimination
- Ask patient if expectations are being met

Standards

- Use expected outcomes established in patient's plan of care
- Use established expected outcomes from professional organizations to evaluate the patient's response to care

Qualities

- Be accountable and responsible for onset of any complications related to care
- Demonstrate perseverance when necessary because some interventions (e.g., pelvic floor exercises) may take weeks to months to effect any change
- Adapt and revise approaches if interventions are ineffective

Figure 43-18 Critical thinking model for urinary elimination evaluation.

- Symptoms common to urinary disturbances include urgency, frequency, dysuria, polyuria, oliguria, and difficulty in starting the urinary stream.
- When collected properly, a clean-voided urine specimen does not contain bacteria from the urethral meatus.
- Methods of promoting the micturition reflex assist patients in sensing the urge to urinate and in controlling urethral sphincter relaxation.
- An increased fluid intake results in increased diluted urine formation that reduces the risk of urinary tract infections.
- An in-dwelling urinary catheter remains in the bladder for an extended period, making the risk of infection greater than with intermittent catheterization.
- Catheter irrigation is necessary when the catheter becomes occluded with sediment or blood clots.
- A catheter drainage system should be a closed system positioned to allow free drainage of urine by gravity.
- Incontinence is classified as transient, urge, stress, mixed, functional, overflow, reflex, or total. Each type has specific nursing interventions.
- Specific guidelines for catheter selection should be followed so that the catheter does not cause harm.

✦ CRITICAL THINKING EXERCISES

- Mrs. Rodriguez is 77 years old and has had problems with urgency for the past two years. The episodes are becoming increasingly frequent. She has been attempting to deal with the problem by using an absorbent pad in her underwear, but she feels as though everyone knows about her incontinence. The embarrassment of urinary odours often keeps her at home. She has given up attending daily mass at church.
 - How can you help Mrs. Rodriguez regain control of her urinary elimination?
 - What actual nursing diagnoses apply to Mrs. Rodriguez?
 - For one of the diagnoses, provide one goal or outcome and two nursing interventions.
- Mrs. Brownell is 37 years old and has been admitted with back pain radiating downward into her groin. She has also noticed blood in her urine for a week, but she was hoping it would go away. She is scheduled to undergo an intravenous pyelogram (IVP) in four hours.
 - What is the purpose of the IVP?
 - What nursing care is needed before Mrs. Brownell goes to the radiography department?
 - Provide at least two nursing responsibilities for care of a patient who has undergone an IVP.
- Mrs. Fenton is 70 years old and has physical limitations related to rheumatoid arthritis. Her daughter, with whom she lives, has brought her to her family practitioner's office. You are the family nurse practitioner in the practice. As you assess Mrs. Fenton, you ask her how she is coping. She begins to answer but then starts to cry and says, "I know when I have to go to the bathroom, but I often don't make it in time." Her daughter asks you for suggestions on how to manage, as she has noticed that her mother's perineal skin is reddened and sore. What assessments need to be completed before planning interventions for Mrs. Fenton's care?
- Hospital-acquired UTIs are often related to poor hand hygiene and
 - Urinary drainage bags
 - Poor perineal hygiene
 - Poor catheterization technique
 - Poor urinary output
- The urine appears concentrated and cloudy because of the presence of white blood cells (WBCs) or
 - Bacteria
 - Urinary drainage bags
 - Blood clots
 - Poor perineal hygiene
- Prompted voiding is most appropriate for
 - Patients with cognitive disorders
 - Patients with small-capacity bladders
 - Patients with urinary obstruction
 - Male patients after prostatectomy
- A patient with stress incontinence
 - Is incontinent after a strong urge to void
 - Is unaware of the need to void
 - Loses small amounts of urine with increased intra-abdominal pressure (e.g., coughing)
 - Exhibits a small-capacity bladder
- Ensuring that an in-dwelling catheter drainage bag is lower than the bladder prevents
 - Urine flowing back into the bladder, which will likely cause an infection
 - Urinary retention
 - Reflex incontinence
 - Urinary incontinence

✦ REVIEW QUESTIONS

- The normal adult urine output is
 - 1000 mL/day
 - 1500 to 1600 mL/day
 - 3000 to 3200 mL/day
 - 4000 mL/day
- Renal alterations result from factors that cause injury directly to the glomeruli or renal tubule, interfering with their normal filtering, reabsorptive, and secretory functions. Selected causes include
 - Transfusion reactions
 - Dehydration
 - Hemorrhage
 - Heart failure
- Postrenal alterations result from obstruction to the flow of urine in the urinary collecting system caused by
 - Dehydration
 - Calculi
 - Hemorrhage
 - Diabetes mellitus
- Which of the following is *not* a risk factor for UTI?
 - Catheterization
 - Antibiotic use
 - Acidic urine
 - Spermicide use
- When applying a condom catheter, it is important to secure the catheter on the penile shaft in such a manner that the catheter is
 - Tight and draining well
 - Dependent and draining well
 - Secured with adhesive tape applied in a circular pattern
 - Snug and secure, but does not cause constriction to blood flow
- The nurse can provide support to the patient with incontinence by
 - Discussing long-term care placement
 - Recommending long-term catheterization
 - Referring to local continence services and Web sites
 - Informing the patient that nothing can be done
- Lifestyle choices to improve incontinence include
 - Immunization
 - Weight loss
 - Cholesterol management
 - Regular medical examination

✦ RECOMMENDED WEB SITES

Canadian Nurse Continence Advisors Association (CNCA): <http://www.cnca.ca/index.htm>

This national association is mandated to enhance the specialty of Nurse Continence Advisors (NCA) in Canada by promoting education, research, and clinical practice.

The Canadian Association for Enterostomal Therapy: <http://www.caet.ca>

The Canadian Association for Enterostomal Therapy (CAET) is a professional organization that represents enterostomal therapy nurses, who provide services for patients with abdominal stomas (openings), fistulae, draining wounds, or selected skin, gastrointestinal, and genitourinary disorders. CAET promotes education, standards, and research for enterostomal practice.

The Canadian Continence Foundation: <http://www.continence-fdn.ca>

The Canadian Continence Foundation is a national, nonprofit organization that serves the education needs of people experiencing incontinence. The foundation implements and promotes professional education and research to advance treatment and management of incontinence.

The Kidney Foundation of Canada: <http://www.kidney.ca>

This national volunteer organization is committed to reducing the burden of kidney disease through funding research, providing education and support, promoting access to health care, and increasing public awareness about kidney health and organ donation.

United Ostomy Association of Canada Inc.: <http://www.ostomycanada.ca>

United Ostomy Association of Canada Inc. is a voluntary organization dedicated to assisting people with bowel or bladder diversions by providing support and information.

Urology Nurses of Canada: <http://www.unc.org>

Urology Nurses of Canada (UNC) is the professional organization for urologic nurses in Canada. Its Web site offers links to urological-related information, including the UNC's professional standards.

Review Question Answers

1. 2, 2, 1, 3, 2, 4, 3, 5, 3, 6, 1, 7, 1, 8, 3, 9, 1, 10, 4, 11, 3, 12, 2

Rationales for the Review Questions appear at the end of the book.

Bowel Elimination

Original chapter by Lori Klingman, RN, MSN

Canadian content written by Jennifer Skelly, RN, PhD, and Melissa Northwood, RN, MSc, GNC(C)

objectives

Mastery of content in this chapter will enable you to:

- Define the key terms listed.
- Discuss the role of gastrointestinal organs in digestion and elimination.
- Describe the integrated processes of oral pharyngeal swallowing and breathing.
- Describe the functions of the large intestine.
- Explain the physiological aspects of normal defecation.
- Discuss the psychological and physiological factors that influence the elimination process.
- Describe the common physiological alterations in elimination.
- Assess a patient's pattern of elimination.
- List the nursing diagnoses related to alterations in elimination.
- Describe the nursing implications for common diagnostic examinations of the gastrointestinal tract.
- List the nursing measures that promote normal elimination.
- List the nursing measures included in bowel training.
- Discuss the nursing measures required for patients with a bowel diversion.
- Use critical thinking in the provision of care to patients with alterations in bowel elimination.

key terms

- | | |
|--|-----------------------------------|
| Bolus, p. 1160 | Fibre, p. 1164 |
| Bowel retraining, p. 1178 | Flatulence, p. 1175 |
| Cathartics, p. 1179 | Flatus, p. 1162 |
| Chyme, p. 1161 | Gastrocolic reflex, p. 1162 |
| Colitis, p. 1168 | Hemorrhoids, p. 1175 |
| Colostomy, p. 1184 | Ileostomy, p. 1184 |
| Constipation, p. 1172 | Impaction, p. 1172 |
| Defecation, p. 1162 | Lactose intolerance, p. 1164 |
| Diarrhea, p. 1174 | Laxatives, p. 1179 |
| Effluent, p. 1186 | Masticate, p. 1160 |
| Enema, p. 1179 | Paralytic ileus, p. 1168 |
| Enterostomal therapist (ET), p. 1187 | Peristalsis, p. 1162 |
| Fecal incontinence, p. 1174 | Peristaltic contractions, p. 1160 |
| Fecal occult blood testing (FOBT), p. 1169 | Stoma, p. 1184 |
| Feces, p. 1162 | Valsalva manoeuvre, p. 1163 |

media resources

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Bowel elimination is crucial to human function and hence critical for nurses to understand in the care of their patients. The gastrointestinal system is a remarkable structure that allows the ingestion of food and absorption of nutrients and, ultimately, the elimination of waste.

Regular elimination of bowel waste is essential for normal body functioning. Alterations in bowel elimination are often early indications of problems within either the gastrointestinal (GI) tract or another body system.

To manage the bowel elimination problems of patients, you must understand the normal elimination process and the factors that promote, impede, or cause alterations in elimination. Of particular concern in managing bowel elimination is supportive nursing care that is respectful of the patient's privacy and emotional needs.

Scientific Knowledge Base

The purposes of the GI tract are to ingest food, break down the ingested food into absorbable forms (digestion), absorb fluid and nutrients, prepare food for both absorption and use by the body's cells, and provide temporary storage of feces (Figure 44-1). The GI tract is a series of hollow, multilayered, muscular organs that are lined with mucous membranes. The mucosal and muscle layers are innervated by the intrinsic enteric nervous system comprising sensory, interneuronal, and motor fibres. The rate of rhythmic contractions is specific to each organ and is controlled by the pacemaker cells in the muscle layers. The central nervous system receives input from the gastrointestinal tract through sensory fibres, which travel in the vagus and sympathetic nerves. Extrinsic sympathetic and parasympathetic motor nerves terminate on the enteric nervous system and act to modulate the activity of the intrinsic enteric nervous system. The GI tract begins at the mouth and continues through to the anus. The mouth, esophagus, and stomach receive food, and initial digestion occurs. The duodenum, jejunum, and ileum are where most digestion and absorption occurs. Finally, the cecum, colon, and rectum store and then eliminate waste. The salivary glands, liver, and pancreas are accessory organs that aid digestion. The GI tract also functions as a specialized immune system, preventing bacteria and viruses of the nonsterile lumen from entering the bloodstream (Hannon & Porth, 2010).

Mouth

The mouth is the point of entry into the GI tract. The mouth mechanically and chemically breaks down nutrients into usable sizes and forms. The teeth **masticate** food, breaking it

down into a soft, moist ball (a **bolus**) suitable for swallowing. Saliva, which is produced by the salivary glands in the mouth, dilutes and softens the food in the mouth for easier swallowing and commences digestion of carbohydrates. In addition, mucus from the salivary glands lubricates the passage of the bolus through the pharynx and down the esophagus during swallowing.

Swallowing begins with the lips closing and the tongue curling with its tip and then the back being pressed to the roof of the mouth (Figure 44-2). The action of swallowing tips the bolus into the pharynx. The pharyngeal cavity is common to both the gastrointestinal tract and the respiratory tract. The swallowed bolus must cross the nasopharynx, and the soft palate must elevate toward the nasopharynx to prevent material from entering the back of the nose. To prevent aspiration, the vocal cords in the glottis close, the epiglottis moves downward to seal off the trachea, and breathing is inhibited in the central nervous system. The bolus enters the esophagus through the relaxed upper esophageal sphincter. This complex process is under striated muscle control and requires an intact nervous system (Hannon & Porth, 2010).

Esophagus

The esophagus provides a conduit to the stomach through the chest cavity. The esophagus is a straight tube about 25 cm in length. Smooth muscle layers of the esophagus provide the peristaltic contractions to move food along its length. Its mucous membranes secrete mucus that aids in the lubrication of food. Sphincters on either end of the esophagus prevent air from entering the esophagus and stomach during breathing and reflux of stomach contents into the esophagus (Hannon & Porth, 2010).

The bolus travels down the relaxed esophagus mainly by gravity to the lower esophageal sphincter, which is opened by the initiation of swallowing in the pharynx and upper esophageal sphincter. A wave of **peristaltic contractions** propels the bolus into the stomach. Peristaltic contractions relax over the bolus and contract behind the bolus, thus moving contents through the length of the GI tract. If the bolus moves slowly or is stuck, a local reflex will relax the area ahead of the bolus and produce a powerful contraction behind the bolus. In the esophagus, this action is known as secondary peristalsis. Tertiary contractions of the esophagus are frequently simultaneous and are produced by irritation of the mucosa by gastric contents. These contractions can be extremely painful and may mimic cardiac chest pain (Hannon & Porth, 2010).

Stomach

The stomach performs several tasks: storage of swallowed food and liquid, mixing of food with liquid and gastric digestive juices, and the controlled emptying of its contents through the pyloric sphincter into the small intestine. It is a baglike structure located in the upper quadrant of the abdomen.

Peristaltic and mixing contractions of the stomach are controlled by the intrinsic pacemaker activity of the smooth muscle cells. Similar to other sections of the GI tract, the stomach is innervated by the enteric nervous system and connections to the parasympathetic and sympathetic nervous systems. The emptying of the stomach is regulated by neural and hormonal mechanisms.

The stomach produces two key GI hormones: gastrin and ghrelin. Gastrin stimulates gastric acid secretion. Ghrelin is newly discovered and has growth-hormone-releasing activity

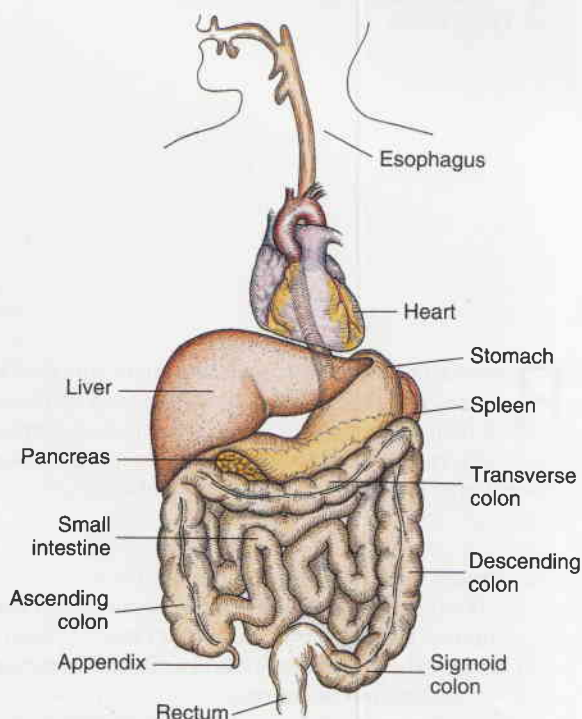


Figure 44-1 Organs of the gastrointestinal tract (with the heart as a reference point).

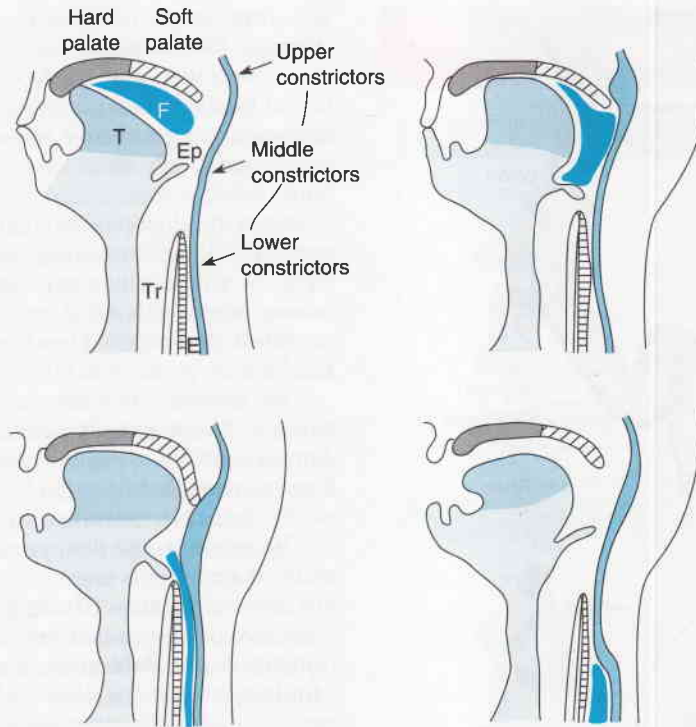


Figure 44-2 Oral and pharyngeal events during swallowing. **A**, The bolus (F) is propelled into the pharynx by placement of the tongue (T) on the roof of the hard palate. **B**, Further propulsion is caused by movement of the more distal regions of the tongue against the palate. Contraction of the upper constrictors of the pharynx and the soft palate separates the oropharynx from the nasopharynx. **C**, Contraction of the pharynx and relaxation of the cricopharyngeal muscle propel the bolus through the upper esophageal sphincter. Upward movement of the glottis and downward movement of the epiglottis (Ep) seal off the trachea (Tr), and the respiratory drive is inhibited in the central nervous system. **D**, The bolus is now in the esophagus (E) and is propelled into the stomach by a peristaltic contraction. **Source:** Johnson, L. R. (2001). *Gastrointestinal physiology* (6th ed., p. 28, Fig. 3-1). St Louis, MO: Mosby.

and stimulates food intake and digestion while reducing energy expenditures. Gastrin and somatostatin regulate the secretion of acid and pepsin in the stomach.

The stomach also secretes hydrochloric acid (HCl) and the intrinsic factor. HCl facilitates the digestion of protein and is antibacterial. The intrinsic factor is essential in the absorption of vitamin B₁₂. Mucus protects the stomach mucosa from acidity and enzyme activity (Hannon & Porth, 2010). The rate at which the stomach empties depends on the content of the dissolved and partially digested bolus (**chyme**). Water diffuses from both the stomach and the small intestine and is emptied rapidly. Carbohydrates are emptied only slightly more slowly, particularly if they are not strongly acidic. Proteins empty even more slowly and in smaller amounts as determined by the acidity of the chyme. Fats are emptied the slowest of all. The controlled emptying allows the pancreatic secretions and bile to neutralize the chyme and secrete enzymes for luminal digestion (Hannon & Porth, 2010).

Small Intestine

The small intestine consists of the duodenum, jejunum, and ileum. The duodenum is about 22 cm long and connects the stomach to the jejunum. The duodenum also contains the opening for the common bile duct and main pancreatic duct. The jejunum and ileum are over 7 m long and are folded closely to fit in the abdomen (Hannon & Porth, 2010).

The duodenum continues to process the chyme from the stomach. The chyme that enters the duodenum is acidic

and contains partially digested protein, carbohydrates, and unemulsified fats. The presence of these substances stimulates the release of the hormones secretin and cholecystokinin from the duodenal mucosa. Secretin stimulates the pancreas to secrete bicarbonate to neutralize the acid. Cholecystokinin stimulates the pancreas to secrete the following enzymes: (1) amylases, which convert carbohydrates to disaccharides; (2) proteases, which further hydrolyze proteins into smaller peptides; and (3) lipases, which hydrolyze triglycerides into fatty acids and monoglycerides. The presence of fats in the duodenum further stimulates cholecystokinin release, which causes the gallbladder to contract, which in turn releases bile to emulsify the fats. Any blockage of the release of these enzymes prevents the digestion of fats and proteins and results in large, fatty, and foul-smelling stools. Undigested fats and proteins reach the colon and are responsible for the changes in fecal appearance (Hannon & Porth, 2010).

The second section of the small intestine, the jejunum, is approximately 2.7 m long. Its primary function is the absorption of carbohydrates and proteins. The ileum, which is approximately 3.7 m long, specializes in the absorption of water, certain vitamins, iron, fats, and bile salts. Most nutrients and electrolytes are absorbed in the small intestine, specifically by the duodenum and the jejunum.

If the small intestine function is impaired, the digestive process is greatly altered. For example, conditions such as inflammation, surgical resection, or obstruction can disrupt contractile activity, reduce the area of absorption, or block the

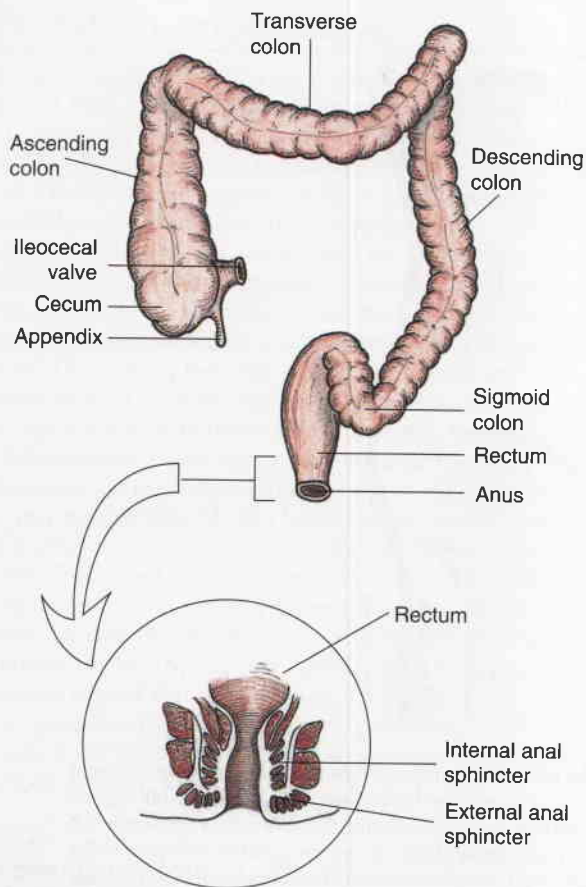


Figure 44-3 Divisions of the large intestine.

passage of chyme. As a result, electrolyte and nutrient deficiencies can develop (Hannon & Porth, 2010).

Large Intestine

The lower GI tract is called the large intestine because it is larger in diameter than the small intestine; however, at 1.5 to 1.8 m in length, it is much shorter. The large intestine is the primary organ of bowel elimination and is divided into the cecum, the colon, and the rectum (Figure 44-3).

Chyme from the terminal ileum enters the cecum of the large intestine, propelled by waves of peristalsis through the ileocecal sphincter, a circular muscle layer that regulates ileal emptying and prevents regurgitation of fecal contents. After a meal, the gastroileal reflex causes the terminal ileum to contract regularly, and the sphincter opens with each contraction, thereby pushing the ileal contents into the colon.

The colon is divided into the ascending, transverse, descending, and sigmoid colons. The colon's muscular tissue allows it to accommodate and eliminate large quantities of waste and gas (**flatus**). The colon has three functions: absorption, secretion, and elimination. Each day, a large volume of water and significant amounts of sodium and chloride are absorbed by the colon (Doughty, 2006).

Two types of muscle contractions occur in the colon: slow-mixing contractions and mass **peristalsis** (or mass movement). Slow-mixing contractions move contents through the colon and expose the chyme to the mucosa, where active absorption of sodium and chloride causes water absorption

and dries the chyme to feces. Intestinal content is the main stimulus for the slow-mixing contractions. Mass peristalsis movements then push the feces toward the rectum. The ingestion of food is the main stimulus for mass peristalsis, which is known as the **gastrocolic reflex**. In adults, these mass movements occur only three or four times each day (Hannon & Porth, 2010).

When the slow-mixing contractions increase and the mass peristalsis diminishes, water continues to be absorbed and the feces dry out, resulting in constipation. Conversely, when the mixing movements are decreased and the mass peristalsis is increased, the water has less time to be absorbed, and the stool will be watery (diarrhea) (Hannon & Porth, 2010).

The secretory function of the colon aids in electrolyte balance. Bicarbonate is secreted in exchange for chloride. Approximately 4 to 9 mmol of potassium is also excreted daily. Extreme alterations in colon function (e.g., diarrhea) can cause severe electrolyte disturbances (Hannon & Porth, 2010).

The rectum is the final portion of the large intestine. Normally, the rectum is empty of waste products, or **feces**, until just before defecation. The rectum contains vertical and transverse folds of tissue that may help to temporarily hold fecal contents during **defecation**. Each fold contains an artery and vein that can become distended from pressure during straining. This distension can result in the formation of hemorrhoids (Doughty, 2006).

The volume of fluids absorbed by the GI tract is high. Oral fluid intake is approximately 1.2 L per day; an additional 7 L of fluid enters from the blood as the result of the secretion of digestive enzymes by the mucosa, liver, gallbladder, and pancreas, and by osmosis as the numbers of molecules in the lumen increase by digestion. Absorption from the small and large intestine amounts to 8.1 L per day, leaving 100 mL to be excreted in the feces. Therefore, maintaining fluid and electrolyte balance is a key function of the GI system (Hannon & Porth, 2010).

Anus and Rectum

Feces and flatus are expelled from the rectum through the anal canal and the anus. Contraction and relaxation of the internal anal sphincter is under autonomic (unconscious) control, whereas the external anal sphincter is under somatic neural (conscious) control. The anal canal is richly supplied with sensory and motor nerve fibres to help control continence. Additionally, the maintenance of the acute anorectal angle formed by the puborectalis and levator ani (pelvic floor) muscles plays a key role in continence (Doughty, 2006).

When feces enter the rectum, the internal anal sphincter relaxes and this enables the anal canal to determine if the contents are solid or liquid. This action occurs concurrently with the reflexive contraction of the external sphincter. Additionally, this contraction can be accompanied by a voluntary squeeze of the sphincter muscles. The rectum is able to hold feces until their presence stimulates stretch receptors in the mucosa, producing an urge to defecate. The patient then seeks out an appropriate place to defecate, assumes a squatting position to straighten the anorectal angle, and voluntarily relaxes the external sphincter. Bearing down tenses abdominal muscles. The pelvic floor muscles relax and the feces enter the lower rectum. Involuntary propulsive contractions continue until the rectum is emptied. When the last of the feces passes, the external anal sphincter reflexively closes (Bliss & Norton, 2010).

Nursing Knowledge Base

Process of Defecation

The physiological factors critical to bowel function and defecation include the acute anorectal angle; reflexes that cause the external anal sphincter to contract when the internal anal sphincter relaxes; pressure in the anal canal at rest facilitated by the internal anal sphincter and voluntary action of the external anal sphincter; sensory response of the rectum to filling with feces; absorption of fluid from the intestine to create formed stool consistency; complete evacuation of the rectum; and physical and cognitive abilities to get to the bathroom when needed (Bliss & Norton, 2010). Normal defecation should be painless, resulting in the passage of a soft, formed stool.

Defecation begins with contractions in the left colon, moving the stool toward the anus. When a stool reaches the rectum, the distension causes relaxation of the internal anal sphincter and signals an awareness of the need to defecate. At the time of defecation, the external sphincter relaxes and abdominal muscles contract to increase intrarectal pressure and force the stool out (Doughty, 2006). Pressure can be exerted to expel feces through a voluntary contraction of the abdominal muscles and the diaphragm while maintaining forced expiration against a closed airway. This action is termed the **Valsalva manoeuvre**. This action should be avoided by patients, particularly those with heart disease, as the increased intrathoracic pressure, immediate tachycardia, and reflex bradycardia can cause cardiac arrest (Marsh, 2003).

Position During Defecation. Instead of straining, patients should be taught about the optimal position to facilitate defecation. Squatting is the normal position during defecation. Toilets are designed to facilitate this posture, by allowing the person to lean forward, exert intra-abdominal pressure, and contract the thigh muscles. Bulging out the abdomen—rather than contracting the abdominal muscles—more effectively opens the bowels (Figure 44-4) (Doughty, 2006). For patients who are immobilized in bed, defecation is often difficult. In a supine position, it is impossible to contract the muscles used during defecation. If the patient's condition permits, raise the head of the bed; this action assists the patient to a more normal sitting position on a bedpan, enhancing the ability to defecate (Ostaszkiwicz et al., 2010).

Promotion of Normal Defecation. Several interventions can stimulate the defecation reflex, affect the character of feces, or increase peristalsis to help patients evacuate bowel contents normally and without discomfort.

Sitting Position. You might need to assist patients who have difficulty sitting because of muscular weakness and mobility problems. Regular toilets are too low for patients who are unable to lower themselves to a sitting position because of joint- or muscle-wasting diseases. Elevated toilet seats require less effort to sit or stand; however, they can create difficulties in achieving a squat position. In many provinces and territories, elevated toilet seats can be acquired through a service agency for minimal or no cost. The community nurse must assess the patient's capabilities in the home and the requirement for any additional equipment to facilitate daily living (Ostaszkiwicz et al., 2010).

Positioning on Bedpan. Patients restricted to bed must use bedpans for defecation. Women use bedpans to pass both urine and feces, whereas men use bedpans only for defecation. Sitting on a bedpan can be extremely uncomfortable. You need to help patients to position themselves comfortably. Two types

Correct position for opening your bowels

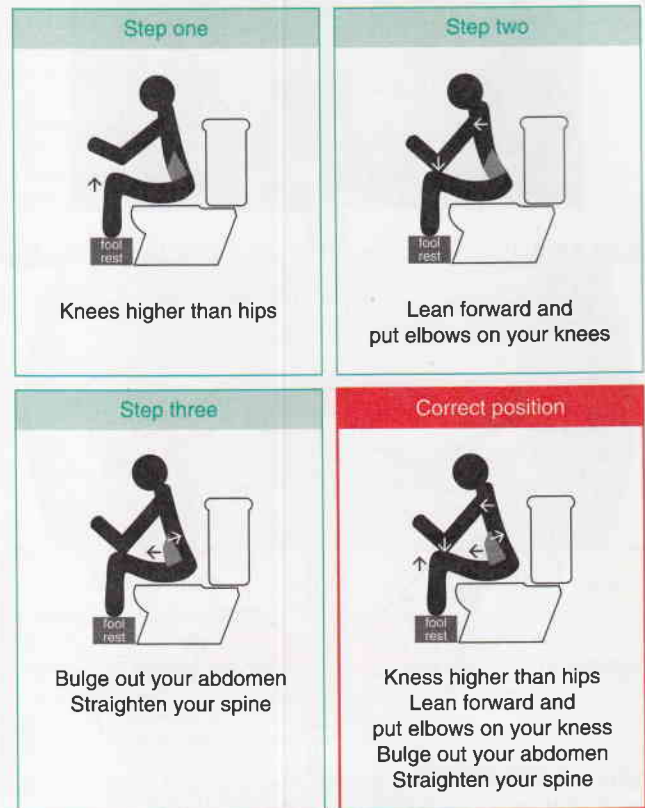


Figure 44-4 Correct position for opening your bowels during defecation. **Source:** Redrawn by permission of Ray Addison, Nurse Consultant in Bladder and Bowel Dysfunction, and Wendy Ness, Colorectal Nurse Specialist. Produced by Norgine Pharmaceuticals Limited, 2003.

of bedpans are available (Figure 44-5). The regular bedpan, made of metal or hard plastic, has a curved, smooth upper end, a sharp-edged lower end, and is approximately 5 cm deep. A fracture pan, designed for patients with body or leg casts, has a shallow upper end and is approximately 1.3 cm deep. The upper end of the pan fits under the buttocks toward the sacrum, and the lower end fits just under the upper thighs. The pan should be high enough so that feces enter the pan. A metal bedpan should be warmed with water first, then dried.

Ensure that you maintain the patient's privacy during bowel elimination. The call light and a supply of toilet paper should be within easy reach. When the patient finishes, respond to the call signal immediately and remove the pan. The patient likely will require assistance with wiping. To remove the pan, ask the patient to roll off to the side or to raise the hips. Hold the pan steady to avoid spilling. Avoid pulling or shoving the pan from under the patient's hips; these actions can pull the patient's skin and cause tissue injury, such as shearing (see Chapter 46). After the pan is removed, while wearing gloves, clean the anal and perineal areas.

After assessing the stool, you should immediately empty the bedpan's contents into the toilet or in a special receptacle in the utility room. The bedpan should be rinsed thoroughly. Care must be taken to avoid splashing the contents or the rinse. Avoiding spillage is of critical importance when using



Figure 44-5 Types of bedpans. From left, regular bedpan and fracture bedpan.

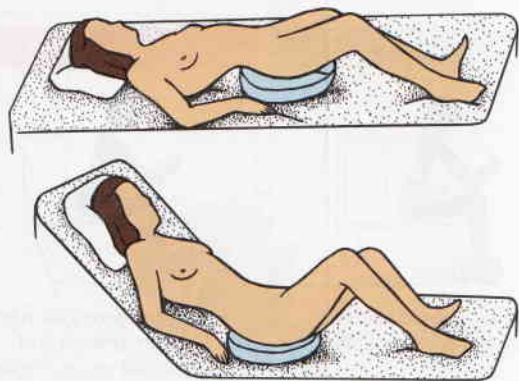


Figure 44-6 Positions on a bedpan. **Top**, Improper positioning of a patient. **Bottom**, Proper positioning of the patient reduces back strain.

universal infection control precautions. The patient uses the same bedpan each time. Chart the characteristics of the feces.

When positioning a patient on a bedpan, use the proper method to prevent muscle strain and discomfort. Never try to lift a patient onto a bedpan. A patient should never be placed on a bedpan and then left with the bed flat unless demanded by activity restrictions. When the bed is flat, the hips remain hyperextended.

Figure 44-6 shows proper and improper positions on a bedpan. The best method is to ensure the patient is positioned high in bed. Raise the patient's head about 30 degrees to prevent hyperextension of the back and to provide support to the upper torso. The patient then raises the hips by bending the knees and lifting the hips upward. Place your hand, palm up, under the patient's sacrum; rest your elbow on the mattress and use it as a lever to help in lifting, while slipping the pan under the patient. Patients who have had abdominal surgery are hesitant to exert strain on suture lines and may have difficulty positioning themselves on a bedpan. To prevent abrasions, do not force the pan along the patient's skin. Always wear gloves when handling a bedpan.

If the patient is immobile or if it is unsafe to allow the patient to exert such effort, you can assist the patient to roll onto the bedpan by using the following steps:

1. Lower the head of the bed flat and assist the patient to roll onto one side, backside toward you.
2. Place the bedpan firmly against the buttocks, down into the mattress with the open rim toward the patient's feet (Figure 44-7).

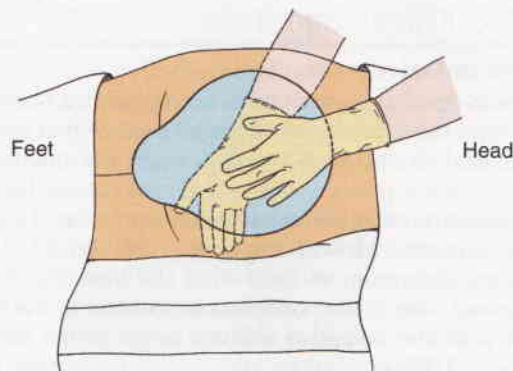


Figure 44-7 Positioning an immobilized patient on a bedpan.

3. Keeping one hand against the bedpan, place your other hand around the patient's far hip. Ask the patient to roll back onto the pan, flat in bed. Do not shove the pan under the patient.
4. When the patient is positioned comfortably, raise the head of the bed 30 degrees.
5. Place a rolled towel or small pillow under the lumbar curve of the patient's back for added comfort.
6. Raise the knee gatch or ask the patient to bend the knees to assume a squatting position. Do not raise the knee gatch if contraindicated (Doughty, 2006).

Factors Affecting Normal Bowel Elimination

Many factors influence the process of bowel elimination. Knowledge of these factors enables you to anticipate measures required to maintain a normal pattern of bowel elimination.

Diet. The food a person eats influences bowel elimination. Regular daily food intake helps to maintain a routine pattern of peristalsis in the colon. **Fibre**, the indigestible residue in the diet, provides the bulk of fecal material. Dietary fibre is classified as insoluble and soluble fibre. Insoluble fibre is found in whole grains, wheat bran, and vegetables and does not dissolve in water. It is effective in preventing constipation. Soluble fibres are found in some beans, certain fruits and vegetables, and wheat bran. Soluble fibre forms a gel when mixed with water and is not as effective in preventing constipation. When a patient's dietary fibre is low, the stool becomes dry, hard, and difficult to pass (Registered Nurses' Association of Ontario [RNAO], 2011).

Ingestion of a high-fibre diet or taking a fibre supplement can improve the likelihood of a regular bowel elimination pattern if other factors are normal. However, because fibre retains fluid in the GI tract, when additional fibre is ingested, adequate fluid intake is essential; inadequate fluid intake can lead to serious constipation or impaction. Recommended daily fluid intake for adults is at minimum 1.5 litres.

Intolerances to certain foods can cause problems with bowel elimination. For example, **lactose intolerance** is the inability to digest lactose, the predominant sugar in milk. When lactose cannot be absorbed, it acts as an osmotic laxative, resulting in diarrhea, gaseous distension, and cramping (Lomer et al., 2008). Individuals who have lactose intolerance must learn how much lactose their body can tolerate. For example, some individuals can drink one glass of milk without effect, but not two.

Fluid Intake. An inadequate fluid intake or disturbances that result in fluid loss (such as vomiting) can affect the character of feces. Fluid liquefies intestinal contents to ease their passage through the colon. Reduced fluid intake slows the passage of food through the intestine and can result in hardening of the stool. Unless a medical contraindication exists, an adult should drink six to eight glasses (1400 to 2000 mL) of noncaffeinated fluid daily (RNAO, 2011). Equally important is to avoid consuming large amounts of caffeinated beverages, such as tea and coffee, as they can be irritating to the bowel and dehydrating. Some patients find that artificial sweeteners can be a bowel irritant as well (Skelly et al., 2006).

Older adults tend to have an insufficient intake of fluids and are more at risk to develop constipation. Sometimes, older adults reduce their fluid intake in an attempt to reduce micturition (see Chapter 42). In addition, in some individuals, an increased ingestion of milk or milk products may slow peristalsis and cause constipation (RNAO, 2011).

Physical Activity. Physical activity promotes peristalsis, whereas immobilization depresses peristalsis. Thus, early ambulation is encouraged as a patient's illness begins to resolve or as soon as possible after surgery to promote maintenance of peristalsis and thereby normal bowel elimination. Maintaining the tone of skeletal muscles used during defecation is important. Weakened abdominal and pelvic floor muscles impair the ability to increase intra-abdominal pressure and to control the external sphincter. Muscle tone may be weakened or lost as a result of long-term illness or neurological disease that impairs nerve transmission. Patients who experience these changes in the abdominal and pelvic floor muscles are at increased risk for constipation (Doughty, 2006; Schnelle et al., 2010).

Personal Bowel Elimination Habits. Personal bowel elimination habits can affect bowel function. Most individuals benefit from being able to use their own toilet facilities at a time that, for them, is both most effective and most convenient. A busy work schedule may prevent a person from going to the bathroom in response to the urge to defecate, thus disrupting regular habits and possibly causing constipation. A person should establish a regular time for bowel elimination (Doughty, 2006). In an institution, the nurse can facilitate this process by establishing toileting times (RNAO, 2011).

As discussed earlier, the ingestion of food is the main stimulus for mass peristalsis, which is known as the gastrocolic reflex. This reflex frequently leads to the need to defecate after a meal. The reflex is the strongest when the stomach is empty, and this is why breakfast is referred to as the "triggering meal" for a bowel movement for most people. The nurse can capitalize on this by offering assistance to toilet 15 to 20 minutes after a patient's breakfast.

Privacy. The patient's privacy must be maintained during bowel elimination. In hospital or long-term care settings, where patients may be in ward accommodation, maintaining visual, auditory, and olfactory privacy is important. Ignoring the call to stool because the patient is embarrassed can begin a cycle of constipation (RNAO, 2011).

Privacy and sensitivity must also be attended to when discussing bowel elimination with patients. Patients are very cautious about discussing bowel elimination because they are too embarrassed to broach the subject. It is the nurse's responsibility to ask about bowel elimination problems and create a therapeutic climate for the patient to voice their concerns (Bliss & Norton, 2010).

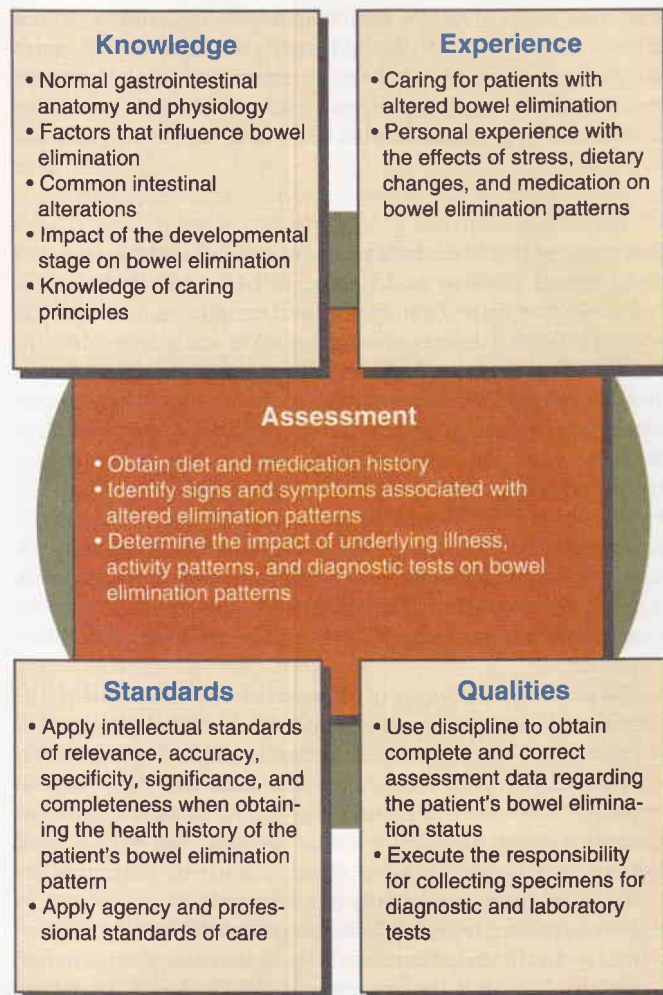


Figure 44-8 Critical thinking model for bowel elimination assessment.

Critical Thinking

Successful critical thinking requires a synthesis of knowledge, experience, information gathered from patients, critical thinking attitudes, and intellectual and professional standards. Clinical judgements require you to anticipate the information necessary, analyze the data, and make decisions regarding patient care. During your assessment (Figure 44-8), you must consider all elements that build toward making appropriate diagnoses and determining the contributing factors to the patient's issues.

To assess a patient's bowel elimination, you must integrate your knowledge from nursing and other disciplines to better understand the patient's response to bowel elimination interruptions. As emphasized earlier, patients often respond to disruptions in bowel elimination with embarrassment. Sensitivity on your part is essential.

Nursing Process and Bowel Elimination

❖ Assessment

Assessment for bowel elimination patterns and abnormalities includes a nursing health history, a physical assessment of the

abdomen, inspection of fecal characteristics, and a review of relevant test results. In addition, you need to determine the patient's perception of the problem and goals for treatment, medical history, pattern and types of fluid and food intake, chewing ability, medications, and recent illnesses and stressors.

Health History

The nursing health history provides a review of the patient's usual bowel patterns and habits. What a patient defines as "normal" may differ from factors and conditions that typically promote normal bowel elimination. You can determine the patient's problems by first identifying the normal and abnormal patterns and habits and then understanding the patient's perception of normal and abnormal regarding bowel elimination. Much of the nursing health history can be organized around the factors that affect bowel elimination:

- **Determination of the patient's usual bowel elimination pattern:** The frequency and time of day of the patient's bowel eliminations should be noted. Have the patient or caregiver complete a bowel elimination diary for a week to enable an accurate assessment of the typical bowel elimination pattern.
- **The patient's description of the usual stool characteristics:** The patient's description should indicate whether the stool is normally watery or formed, soft or hard; the typical colour; whether the stool floats or sinks; and whether blood is present. Ask the patient to describe the usual shape of the stool and the number of stools per day. The Bristol Stool Chart is a handy figure to show patients to determine the nature of their usual stools (see Figure 44-9).
- **Identification of routines followed to promote normal bowel elimination:** Examples of routines to promote bowel elimination are drinking hot liquids, eating specific foods, or taking time to defecate at a certain time of the day.
- **Assessment of the use of laxatives, suppositories, or enemas:** Assess whether the patient uses enemas, laxatives,

suppositories, or bulk-forming food additives in order to have a bowel movement. Ask the patient how often such an aid is used.

- **Assessment of cognitive abilities:** You must determine the patient's ability to understand the questions you pose. You may need to conduct a brief mental status examination. In situations where you are concerned, obtaining a corroborating history is critical.
- **Changes in appetite:** Note any changes in the patient's normal eating patterns and any change in weight (i.e., the amount lost or gained). If a change of weight has occurred, ask whether the weight change was planned, such as weight loss as a result of a low-calorie diet.
- **Diet history:** Determine the patient's dietary preferences. Assess the intake of fruits, vegetables, cereals, and breads and whether mealtimes are regular or irregular. In the case of the patient who is frail and living alone, determine whether acquiring food requires assistance (e.g., financial help, food preparation assistance, or transportation to a grocery store with a full selection of fresh fruits and vegetables).
- **Description of daily fluid intake:** Determine the type and amount of fluid consumed in a typical day. The patient might need to estimate the amount by using common household measurements.
- **History of surgery or illnesses affecting the GI tract:** This information can help to explain symptoms and to assess the patient's potential for maintaining or restoring a normal bowel elimination pattern. A patient's family history of gastrointestinal cancer is also relevant to your assessment.
- **Medication history:** Ask for a list of the patient's current medications. The medication history must include both prescribed and over-the-counter medications (e.g., laxatives, antacids, iron supplements, and analgesics) that might alter defecation or fecal characteristics. The community nurse should ask to see the medications.
- **Emotional state:** The patient's emotional state can significantly alter the frequency of defecation. During assessment, observe and ask directly about the patient's emotions and the presence of stress.
- **History of exercise:** Ask the patient to describe the type and amount of daily exercise and if there have been any recent changes to this activity level.
- **History of pain or discomfort:** Ask whether the patient has a history of abdominal or anal pain or pain with defecation. The quality, radiation, triggers, and location of pain may help to identify the source of the problem.
- **Environment and adaptive aids:** Patients have many different living arrangements. Where patients live may affect their toileting habits. If the patient is sharing living quarters, how many bathrooms are available? Does the patient have his or her own bathroom, or does the patient need to share the facilities and thus adjust the time the bathroom is used to accommodate other persons? If the patient lives alone, is he or she capable of ambulating to the toilet safely? If the patient is not independent in bowel management, who assists the patient and how? Does the patient use a bedpan, commode, or urinal? Does the patient wear incontinence products? Does the patient use a raised toilet seat or require grab bars?
- **Mobility and dexterity:** The patient's mobility and dexterity need to be evaluated to determine whether the patient needs assistive devices or personal assistance.

The Bristol Stool Form Scale

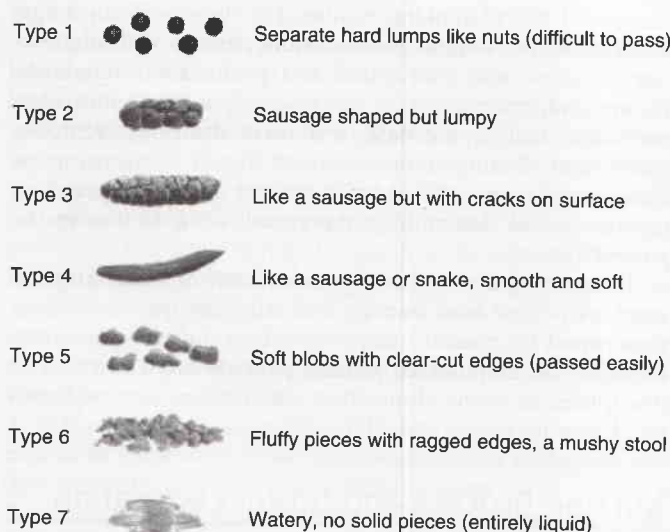


Figure 44-9 The Bristol Stool Chart **Source:** Bristol stool form guideline. Retrieved from <http://www.aboutconstipation.org/bristol.html>.

- **Presence and status of bowel diversions:** If the patient has an ostomy, assess the frequency of fecal drainage, the character of the feces, the appearance and condition of the stoma (e.g., the colour, the presence of swelling, and signs of irritation), the type of fecal collection device used, and the methods used to maintain the ostomy's function.

Physical Assessment

Your physical assessment (see Chapter 31) evaluates a patient's body systems and functions that are likely to be affected by the presence of bowel elimination problems.

Mouth. Your inspection of the mouth includes examining the patient's teeth, tongue, and gums. Poor dentition or poorly fitting dentures influence the ability to chew (see Chapter 42). Sores in the mouth can make eating not only difficult but also painful. A dry mouth may indicate dehydration (Jarvis et al., 2009).

Abdomen. Inspect all four abdominal quadrants for contour, shape, symmetry, and skin colour. Note masses, peristaltic waves, scars, venous patterns, stomas, and lesions. Normally, peristaltic waves are not visible; however, observable peristalsis can be a sign of intestinal obstruction.

Abdominal distension appears as an overall outward protuberance of the abdomen. Distension may be caused by intestinal gas, large tumours, or fluid in the peritoneal cavity. A distended abdomen feels tight, like a drum, and the skin appears taut, as if stretched (Jarvis et al., 2009).

Use percussion to detect lesions, fluid, or gas in the abdomen. Familiarity with the five percussion notes (see Chapter 31) permits identification of the underlying abdominal structures. Gas or flatulence creates a tympanic note. Masses, tumours, and fluid are dull to percussion.

Auscultate the abdomen with the stethoscope to assess bowel sounds in each quadrant (see Chapter 31). Normal bowel sounds occur every 5 to 15 seconds and last from one second to several seconds. While auscultating, note the character and frequency of the bowel sounds. An increase in pitch or a tinkling sound may be heard when the abdomen is distended. The lack of bowel sounds or the presence of

hypoactive sounds (fewer than five sounds per minute) occur when the patient has a paralytic ileus, such as after abdominal surgery. High-pitched and hyperactive bowel sounds (35 or more sounds per minute) occur when the small intestine is obstructed or when inflammatory disorders are present (Jarvis et al., 2009).

Gently palpate the abdomen for masses or areas of tenderness (see Chapter 31). During this procedure, encourage the patient to relax. Tensing of the abdominal muscles interferes with palpating underlying organs or masses (Jarvis et al., 2009).

Rectum. Inspect the area around the anus for lesions, discolourations, inflammation, and hemorrhoids. Abnormalities should be carefully recorded (see Chapter 31) (Jarvis et al., 2009).

Factors Related to Altered Patterns of Bowel Elimination

Age-Related Changes. Normal age-related changes affect bowel elimination (Table 44-1). In addition, many issues associated with aging can significantly alter bowel elimination, including polypharmacy, poor nutrition, life stressors, and comorbidities (Meiner, 2011).

Older adults also lose muscle tone in the perineal floor and the anal sphincter. Although the integrity of the external sphincter may remain intact, older adults may have difficulty controlling bowel evacuation and are at risk for incontinence. In addition, older adults may have a slowing of the nerve impulses to the anal region: some individuals are less aware of the need to defecate and, as a result, develop irregular bowel movements and are at risk for constipation (Meiner, 2011).

Infectious Disease. Microbial agents, including viruses, bacteria, and protozoa, can infect the GI tract. These infections can cause diarrhea and inflammatory or ulcerative changes in the small or large intestine. Most infections are spread by the oral-fecal route, through contaminated food or water.

The rotavirus is an example of a viral infection and is responsible for most nonbacterial food-borne epidemic gastroenteritis in all age groups. The virus is shed before and for days

► TABLE 44-1 Normal Age-Related Changes in the Gastrointestinal Tract

Portion of Gastrointestinal Tract	Functional or Physiological Change	Age-Related Causes
Mouth	Difficulty chewing and oral dryness	Medications can decrease saliva production. Taste buds atrophy.
Esophagus	Increase incidence of acid reflux	Reduced motility. Loss of muscle and ligament tone Decreased esophageal contractions.
Stomach	Decrease in acid secretions Not able to accommodate large amounts of food Increase risk of peptic ulcer disease, anemia, and stomach cancer Decrease in mucosal thickness	Degeneration of gastric mucosa Loss of parietal cells also leads to loss of the intrinsic factor, which is needed for vitamin B ₁₂ , iron, calcium, and folic acid absorption.
Small intestine	Decreased nutrient absorption	Atrophy of muscle and mucosal surfaces
Large intestine	Increased risk of diverticuli Increased occurrence of constipation Missed defecation signal	Atrophy of mucosa Atherosclerotic vascular changes Decrease in tone of internal and external sphincters

Source: Data from Meiner, S. (2011). *Gerontologic nursing* (4th ed.). St Louis, MO: Mosby.

after clinical illness. Very few infectious viruses are actually needed to cause disease. Rotavirus infection begins after about 24 hours' incubation and presents with mild to moderate fever and vomiting, followed by watery stools. Treatment is focused on preventing dehydration (Hannon & Porth, 2010).

Clostridium difficile (*C. difficile*) **colitis** is a bacterial infection associated with antibiotic therapy. Treatment with broad-spectrum antibiotics can lead to the disruption of the normal flora of the colon, creating colonization by *C. difficile* and the release of toxins that damage the mucosa and cause inflammation. The infection manifests with mild to moderate diarrhea and lower abdominal cramping. *C. difficile* is usually acquired in the hospital setting, where the organism is commonly found. Treatment includes immediate discontinuation of the antibiotic and in cases where symptoms are severe, treatment is aimed at eradication of *C. difficile* (Hannon & Porth, 2010).

Outbreaks of the highly contagious Norwalk virus are common in Canadian schools, hospitals, day care centres, and nursing homes. The Norwalk virus has been described as "the winter vomiting disease" and rapidly spreads to staff, students, and patients. When the Norwalk virus is detected, standard infection control procedures need to be implemented rapidly, accompanied by further precautions, such as isolation of the affected units, strict handwashing protocols, the wearing of gloves and gowns, and a thorough washing down of the affected units. When an outbreak occurs, the institution is frequently closed to visitors, and infected staff are required to remain off duty until they are symptom-free for 48 hours. In healthy individuals, symptoms last from 12 to 60 hours. The very young, older adults, and ill patients are at danger from dehydration and electrolyte imbalance (Conly & Johnston, 2003).

Irritable Bowel Syndrome. Irritable bowel syndrome (IBS) is a functional gastrointestinal disorder with chronic intestinal symptoms that cannot be explained by structural or biochemical abnormalities. The symptoms of IBS can include abdominal pain, altered bowel function, flatulence, bloating, nausea, anorexia, and diarrhea. The hallmark symptom is abdominal pain that is relieved by defecation and accompanied by a change in the frequency or consistency of stools (Hannon & Porth, 2010).

IBS is related to diet, stress, and psychological factors and its onset may be triggered by a GI infection. The precise pathophysiology of IBS is not understood. Management is multimodal, based on the patient's most troublesome symptoms and includes counselling, dietary modifications, and medications (such as bulking agents, antispasmodics, and antidepressants) (Quartero et al., 2005). The nurse can support the patient with IBS by offering coaching on stress management and maintaining a high-fibre diet (Hannon & Porth, 2010).

Diabetes. Patients with diabetes frequently report problems with constipation and/or diarrhea due to GI autonomic neuropathy. Hyperglycemia can directly reduce or slow gastric contractions and the GI emptying rate. GI symptoms are more prevalent in patients with poor glycemic control. Symptoms can be improved by dietary changes, including reducing fats and increasing daily fibre intake (Bharucha et al., 2008; DUBY et al., 2004).

Pain. Normally, the act of defecation is painless. However, several conditions can result in discomfort, including hemorrhoids, rectal surgery, rectal fistulas, and abdominal surgery. In these instances, to avoid pain, the patient often suppresses

the urge to defecate. As a result, constipation and impaction may develop.

Pelvic Floor Trauma. Trauma to the pelvic floor muscles from pregnancy, labour and delivery, and aging can affect bowel elimination in women.

As pregnancy advances, the size of the fetus increases and pressure is exerted on the rectum. A temporary obstruction created by the fetus impairs the passage of feces. Slowing of peristalsis during the third trimester often leads to constipation. A pregnant woman's frequent straining during defecation or delivery can result in the formation of permanent hemorrhoids. Damage to the perineum extending to the anal sphincters during labour can also alter sphincter integrity (Doughty, 2006).

Older women, particularly those who have borne children, frequently develop loss of tone and weakening of the ligaments and muscles of the anterior and posterior vaginal walls. This condition can lead to cystocele (the dropping of the bladder into the vagina), rectocele (the pouching of the feces-filled rectum into the vagina), and sometimes complete prolapse of the uterus out of the vagina. Both of these conditions alter the anorectal angle and can inhibit complete evacuation (Doughty, 2006). Nurse Continence Advisors (i.e., registered nurses who are specially educated in continence care) treat these problems by educating patients about high-fibre diets and teaching pelvic floor muscle exercises, often referred to as Kegel exercises (Skelly et al., 2006).

Acute Illness, Surgery, and Anaesthesia. The GI system may be affected by any acute illness. Changes in the patient's fluid status, mobility patterns, nutrition, and sleep cycle can affect regular bowel habits. Surgical interventions on the GI tract affect bowel elimination, as will surgery on other systems, such as the musculoskeletal and cardiovascular systems.

The general anaesthetic agents used during surgery cause temporary cessation of peristalsis (see Chapter 48). Inhaled anaesthetic agents block the parasympathetic impulses to the enteric nervous system, and the stress of surgery stimulates the sympathetic nervous system. The anaesthetic's action slows or stops the integrated contractions. Pain control medication that contains opioids has the adverse effects of slowing mass peristalsis (or mass movement) and increasing the slow-mixing contractions and fluid absorption from the colon. Thus, following surgery, abdominal discomfort from intraluminal gas and constipation are frequent, and the surgeon's postoperative orders typically include bowel routine with laxatives and enemas if bowel movements do not occur within two to three days. Thus, you need to note whether and when the first bowel movement postsurgery occurs because the patient may require treatment for constipation. Early postoperative ambulation stimulates the evacuation of flatus, stimulates peristalsis, and alleviates abdominal pain (Lewis et al., 2010).

The patient who receives local or regional anaesthesia is less at risk for bowel elimination alterations because bowel activity may be affected minimally or not at all. Any surgery that involves direct manipulation of the bowel temporarily stops peristalsis. This condition, called **paralytic ileus**, usually lasts 24 to 48 hours. If the patient remains inactive or is unable to eat after surgery, return of normal bowel function may be further delayed (Lewis et al., 2010).

Enteral Feeding. Patients receiving enteral feeding will experience changes in bowel elimination. When the absorptive area of the small intestine is reduced, patients may receive

nutrition through enteral feeding administered by tube into the gastrointestinal tract. Enteral feeding contains nutrients that do not need further digestion to be rapidly absorbed by the diminished area of the intestine.

Patients receiving their nutrition through enteral feeding may experience diarrhea. This can be due to the feed running too quickly, medications, or an active infection (Lewis et al., 2010). Conversely, a patient could experience problems with constipation. This is usually related to the type of formula used, and a change to a high-fibre formula may resolve the constipation (Lewis et al., 2010). Again, medications the patient is taking must be examined for their effects on the GI system (Lewis et al., 2010).

Medications that Affect Elimination. Medication may have certain expected actions on the bowel; for example, some medications promote defecation and others control diarrhea. In addition, medications prescribed for acute and chronic conditions may have secondary effects on the patient's bowel elimination patterns (Table 44-2).

Laboratory Tests

Laboratory and diagnostic examinations yield useful information concerning bowel elimination problems (Table 44-3). Laboratory analysis of fecal contents can detect pathological conditions, such as tumours, bleeding, and infection.

Fecal Specimens. You are directly responsible for ensuring that fecal specimens are accurately obtained, properly labelled in appropriate containers, and transported to the laboratory on time. Institutions provide special containers for fecal specimens. Some tests require specimens to be placed in chemical preservatives.

Medical aseptic technique should be used during collection of stool specimens (see Chapter 32). Because approximately 25% of the solid portion of a stool is bacteria from the colon, wear disposable gloves when handling fecal specimens.

Hand hygiene is necessary for anyone who might come in contact with the specimen. The patient can often obtain the specimen if properly instructed. Explain that feces cannot be mixed with urine or water. For this reason, the patient must defecate into a clean, dry bedpan or a special container placed under the toilet seat.

Tests performed by the laboratory for occult (microscopic) blood in the stool and stool cultures require only a small sample. Collect about 2.5 cm of formed stool or 15 to 30 mL of liquid diarrhea stool. Tests for measuring the output of fecal fat require a three- to five-day collection of stool. All fecal material must be saved throughout the test period.

After obtaining a fecal specimen, label and tightly seal the container, complete the laboratory requisition forms, and record the specimen collections in the patient's medical record. Avoid delays in sending specimens to the laboratory because some tests, such as measurements for ova and parasites, require the stool to be warm. When stool specimens are allowed to stand at room temperature, bacteriological changes occur that can alter the test results.

A common laboratory test that can be done at home or at the patient's bedside is the **fecal occult blood test (FOBT)**, or guaiac test, which measures microscopic amounts of blood in the feces (Box 44-1). This test is useful as a diagnostic screening for colon cancer (Box 44-2). A single positive result does not confirm GI bleeding. The test should be repeated at least three times while the patient refrains from ingesting foods and medications that can cause false-positive results. For example,

► TABLE 44-2

Medications and the Gastrointestinal System

Medication	Action
Opioids	Increase the mixing action of segmentation contractions and slow the propulsive contractions, often resulting in constipation, nausea, vomiting, or anorexia (Lilley et al., 2011).
Anticholinergics (such as atropine)	Inhibit gastric acid secretion and depress gastrointestinal motility. Although anticholinergics are useful in treating hyperactive bowel disorders, they can cause constipation (Lilley et al., 2011).
Antibiotics	Frequently produce diarrhea by disrupting the normal bacterial flora in the gastrointestinal tract. Antibiotic use has been shown to promote infection with the highly contagious <i>C. difficile</i> , which has a high mortality rate in older adults. Concurrently taking a probiotic acidophilus supplement has been shown to reduce the incidence of diarrhea and to reduce the risk of <i>C. difficile</i> infections (McFarland, 2006).
Nonsteroidal anti-inflammatory drugs (such as acetylsalicylic acid)	Prostaglandin inhibitors are used to treat arthritis pain but can also promote gastrointestinal irritation that can range from dyspepsia to life-threatening hemorrhage (Lilley et al., 2011).
Histamine ₂ (H ₂) antagonists (such as ranitidine)	Reduce the secretion of hydrochloric acid and commonly used to treat many acid-related disorders. Suppress gastric acid secretion and may also predispose patients to GI infections (Lilley et al., 2011).
Proton pump inhibitors (such as omeprazole)	Can cause blackening of the stool and can lead to constipation (Lilley et al., 2011).
Iron	Can cause blackening of the stool and can lead to constipation (Lilley et al., 2011).
Calcium carbonate	Adverse GI effects include constipation, obstruction, nausea, vomiting, and flatulence (Lilley et al., 2011).

during the test period, the patient should avoid ingesting red meat, poultry, fish, some raw vegetables, vitamin C, aspirin, or other nonsteroidal anti-inflammatory medications that can cause false-positive results (Colon Cancer Check, 2011). Patients who receive anticoagulants or who have a bleeding disorder or a GI disorder known to cause bleeding (e.g., intestinal tumours, bowel inflammation, or ulcerations) should be regularly screened for fecal occult blood.

Fecal Characteristics. Inspection of fecal characteristics (Table 44-4) reveals information about the nature of bowel elimination alterations. Several factors can influence each characteristic. A key to assessment is knowing whether any recent changes have occurred. The patient can best provide this information during the health history assessment.

► TABLE 44-3

Laboratory and Diagnostic Tests for Bowel Function**Measurement****Interpretation****Laboratory Tests**

Total bilirubin	Increased levels of bilirubin may result from hepatobiliary diseases, obstructions in the bile duct, certain anemias, and reactions to blood transfusions.
Alkaline phosphatase	Elevated levels of alkaline phosphatase may indicate obstructive hepatobiliary diseases, hepatobiliary carcinomas, bone tumours, or healing fractures.
Amylase	Elevated levels of amylase may indicate abnormalities of the pancreas, such as inflammation, tumours, cholecystitis, necrotic bowel, and diabetic ketoacidosis.
Carcinoembryonic antigen (CEA)	The carcinoembryonic antigen is elevated in the presence of cancer, inflammation of the GI tract, or hepatobiliary organs.

Direct Visualization**Endoscopy**

A colonoscopy is a routine examination for persons 50 years of age and older. Normally the GI tract is free of polyps, tumours, inflammation, ulcers, hernias, obstruction, and ulcerations. If a lesion, such as a polyp, is identified, the physician removes the growth or a portion of the growth and sends it to pathology for analysis. If bleeding is present, the physician may attempt to coagulate the source. In some cases, the identification of an abnormality may indicate the need for follow-up surgery for the patient.

Indirect Visualization**X-ray with contrast medium**

An X-ray may identify the presence of acute abnormalities in the GI tract. A series of X-rays will allow for indirect visualization of the entire tract. The presence of tumours, ulcerations, inflammation, or other abnormalities may indicate the need for further diagnostic testing and medical or surgical intervention.

Source: Chernecky, C. C., & Berger, B. (2008). *Laboratory tests and diagnostic procedures*, St Louis, MO: Saunders Elsevier.

► BOX 44-1

Procedural Guideline**Measuring Fecal Occult Blood****Delegation Considerations:**

This skill can be delegated to unregulated care providers (UCPs). The nurse directs the UCP to report immediately if blood is detected. You assess the significance of the findings.

Equipment:

- Hemoccult test paper
- Wooden applicator
- Clean gloves
- Clean, dry container to collect sample

Procedure:

1. Explain to the patient the purpose of the test and how the patient can assist. Patients can collect their own specimens if possible. Specimen must be free of urine and toilet paper.
2. Perform hand hygiene.
3. Apply clean disposable gloves.
4. Obtain uncontaminated stool specimen.
5. Use the tip of the wooden applicator to obtain a small portion of a stool specimen. Ensure the specimen is free of toilet paper.
6. Open the flap of the hemoccult slide. Using the wooden applicator, thinly smear the stool in the first box of the guaiac paper. Apply a second fecal specimen from a different portion of the stool to the slide's second box (see Step 6 illustration).



Step 6 Application of the fecal specimen on guaiac paper.

7. Close the slide cover and send the sample to the laboratory per your institution's policies and procedures.
8. Wrap the wooden applicator in a paper towel. Remove gloves and discard in the proper receptacle.
9. Perform hand hygiene.
10. Record any unusual fecal characteristics.

Diagnostic Examinations

A variety of radiological and diagnostic tests may be ordered for the patient who experiences altered bowel elimination (Box 44-3). Visualization of GI structures may be made by either a direct or indirect approach. Each test has a prescribed preparation routine to empty the GI area under study to facilitate visualization. Many facilities use conscious sedation during these procedures. Be sure you understand the safety precautions involved in the use of this form of anaesthesia. In many institutions, special training is required. A crash cart must be

present at the bedside, and the patient must be monitored continuously with pulse oximetry and frequent vital signs, usually every 15 minutes during and immediately following the procedure. Check the agency policy regarding the use of sedation for these examinations (Pagana & Pagana, 2010).

Diagnostic Tests. Diagnostic examinations that involve visualization of GI structures often require that portions of the bowel be empty. The patient receives a prescribed bowel

preparation before the test. Usually, the patient is asked to drink a large volume (4 L) of a solution containing a nonabsorbable inert molecule, such as polyethylene glycol. Other medications, cathartics, or enemas may also be used. In addition, the patient is not allowed to eat or drink after midnight of the day preceding examinations such as a colonoscopy, endoscopy, or other testing that requires visualization of the lower GI tract. Following the diagnostic procedure, the patient may experience changes in bowel elimination, such as increased gas or loose stools. These changes will stop when the patient resumes a normal eating pattern (Pagana & Pagana, 2010).

❖ Nursing Diagnosis

Your assessment of the patient's bowel function reveals data that may indicate an actual or potential bowel elimination problem or a problem resulting from bowel elimination alterations. The concept map in Figure 44-10 depicts how the nursing diagnosis of constipation may be related to other diagnoses. In this example, a patient with cancer has developed constipation as a result of activity intolerance and imbalanced nutrition. Both conditions are a result of the patient's pain. Diagnoses that may apply to patients with bowel elimination problems include the following:

- *Bowel incontinence*
- *Constipation*
- *Risk for constipation*
- *Perceived constipation*
- *Diarrhea*

A patient's associated problems, such as body-image changes or skin breakdown, require interventions unrelated to bowel function impairment. In some instances, however, you need to direct as much attention to the associated problem as to the bowel elimination problem.

Your ability to identify the correct nursing diagnosis depends not only on the thoroughness of assessment but also on recognition of defining characteristics and factors that can

► BOX 44-2 Screening for Colon Cancer

Risk Factors

- Older than 50 years of age
- Family history of colorectal cancer (particularly parent, child, or sibling)
- History of inflammatory bowel disease (e.g., ulcerative colitis or Crohn's disease)
- High-fat and low-fibre diet
- Obesity
- Excessive alcohol consumption
- Smoking
- Physically inactive

Warning Signs

- Unexplained change in bowel patterns
- Rectal bleeding
- Unexplained weight loss
- Urgent need to empty bowel
- Unexplained stool incontinence

Screening Tests

- Fecal occult blood test (FOBT) at least every two years after age 50
- If patient has family history of colorectal cancer in first-degree relative or has symptoms, colonoscopy

Source: Colon Cancer Check. (2011). *Colon cancer check public information*. Retrieved from <http://health.gov.on.ca>.

► TABLE 44-4 Characteristics of Feces

Characteristic	Normal	Abnormal	Cause of Abnormality
Colour	Brown	White or clay	Absence of bile pigment, such as in obstructive jaundice
		Black or tarry (i.e., melena)	Iron ingestion or upper gastrointestinal bleeding
		Red	Lower gastrointestinal bleeding, hemorrhoids
		Pale with fat or frothy	Malabsorption of fat
		Mucus or pus	Spastic constipation, colitis, excessive straining
Odour	Pungent; affected by food type	Bloody mucus	Blood in feces, inflammation, infection, hemorrhoids
		Noxious change	Blood in feces or infection
		Liquid	Diarrhea, reduced absorption
Consistency	Soft, formed	Hard	Constipation
		More than three times a day or less than once a week	Hypomotility or hypermotility (multifactorial)
Frequency	Daily or two to three times weekly		
Shape	Resembles diameter of rectum	Narrow, pencil shaped	Anal or distal rectal carcinoma
Constituents	Undigested food, dead bacteria, fat, bile pigment, cells lining intestinal mucosa, water	Blood, pus, foreign bodies, mucus, worms	Internal bleeding, infection, swallowed objects, irritation, inflammation
		Excess fat	Malabsorption syndrome, enteritis, pancreatic disease, surgical resection of intestine

Sources: Jarvis, C., Browne, A., MacDonald-Jenkins, J., & Luctkar-Flude, M. (Eds.). (2009). *Physical examination and health assessment* (1st Canadian ed.). Toronto: Elsevier Canada; and Swartz, M. H. (2009). *Textbook of physical diagnosis history and examination*. (6th ed.). Philadelphia, PA: Saunders Elsevier.

► BOX 44-3 Radiological and Diagnostic Tests

Flat Plate Radiography

- A simple X-ray film of the abdomen that requires no preparation.

Computerized Tomography Scan

- An X-ray examination of the body from many angles uses a scanner and is analyzed by a computer.
- The preparation may be either nothing by mouth (NPO) or no preparation.
- The patient must be informed of the need to lie very still. If claustrophobia is a problem, light sedation may be used.

Ultrasound Imaging

- Technique used to visualize abdomen and organs within.
- High-frequency sound waves echo off body organs to create a picture.
- The preparation depends on the organ to be visualized and may include either fasting or no preparation.

Upper Gastrointestinal Barium Swallow Esophagram

- An X-ray examination uses an opaque contrast medium (e.g., barium) to examine the structure and motility of the upper gastrointestinal tract, including the pharynx, esophagus, and stomach.
- The patient must be restricted to NPO after midnight the night before the examination.
- The patient must remove all jewellery and other metallic objects.
- After the test, the patient must increase fluids to facilitate passage and elimination of the barium.

Lower Gastrointestinal Barium Enema

- An X-ray examination uses an opaque contrast medium to examine the lower gastrointestinal tract.
- The preparation includes a bowel preparation or cathartic to empty any remaining stool particles.

Upper Gastrointestinal Endoscopy

- An endoscopic examination of the upper gastrointestinal tract allows a more direct visualization via a lighted fiberoptic tube.
- The preparation is similar to that of the upper gastrointestinal barium swallow.
- A light sedation is required.

Colonoscopy

- An endoscopic examination of the rectum and colon that uses a long, flexible tube (i.e., a colonoscope) inserted into the rectum.
- Bowel must be cleansed and free of fecal material.
- Light sedation is required.

Sigmoidoscopy

- An examination of the interior of the sigmoid colon.
- Preparation is similar to that of a colonoscopy.
- Light sedation is required.

Magnetic Resonance Imaging

- A noninvasive examination uses magnetic and radio waves to produce a picture of the inside of the body.
- Provides better contrast between normal and pathologic tissue than an ultrasound.
- The preparation is NPO four to six hours before examination.
- No metallic objects are allowed in the room, including metal objects on clothes.

Source: Pagana, K. D., & Pagana, T. J. (2010). *Mosby's manual of diagnostic and laboratory tests*. (4th ed.). St Louis, MO: Mosby Elsevier.

impair bowel elimination (Box 44-4). You need to determine the patient's risk, and then institute measures to ensure maintenance of normal bowel function.

Common Bowel Elimination Problems

You might care for patients who have or are at risk for bowel elimination problems because of emotional stress (anxiety or depression), inflammatory diseases, prescribed therapy, disorders impairing defecation, or physiological changes in the GI tract, such as surgical alteration of intestinal structures.

Constipation. Constipation is a symptom, not a disease (Box 44-5). The signs of constipation vary among patients, but usually include infrequent bowel movements (fewer than three per week), difficult evacuation of feces, inability to defecate at will, and hard feces (Ginsberg et al., 2007). Common signs are abdominal pain and distension and a sensation of fullness and pressure in the rectum. Straining during defecation is also an associated sign. When intestinal motility slows, the fecal mass becomes exposed over time to the intestinal walls and most of the fecal water is absorbed. Little water is left to soften and lubricate the stool. Passage of a dry, hard stool may cause rectal pain (Ginsberg et al., 2007). Constipation is a common concern during acute hospital admissions for older adults (Box 44-6).

Constipation can be a significant hazard to health. Straining during defecation may cause problems to the patient who has recently undergone abdominal, gynecological, or rectal surgery.

The effort to pass a stool can cause sutures to separate, thereby reopening the wound. Patients who have a history of cardiovascular disease, diseases causing elevated intraocular pressure (glaucoma), and increased intracranial pressure should prevent constipation and avoid using the Valsalva manoeuvre. The Valsalva manoeuvre can be avoided by exhaling through the mouth during straining. Constipation also affects a person's quality of life (Bliss & Norton, 2010).

Patients may experience constipation as a result of medications they are taking. Medications that cause constipation include anticholinergics, antidepressants, antiemetics, antihistamines, antihypertensives, anti-Parkinson agents, antipsychotics, antacids containing aluminum, analgesics, NSAIDs; histamine-2 blockers, hypnotics, diuretics, sedatives, iron supplements, and opioids (RNAO, 2011).

Constipation can also occur in conjunction with the treatment of urinary conditions, as an adverse effect of the medication but also because individuals with urinary incontinence may reduce their fluid intake to reduce the frequency of their need to urinate (Ginsberg et al., 2007).

Impaction. Fecal impaction results from unrelieved constipation. Fecal impaction is a collection of hardened feces that are wedged in the rectum and cannot be expelled. In cases of severe impaction, the mass can extend into the sigmoid colon. Patients who are debilitated, confused, or unconscious are most at risk for impaction. They are too weak or are unaware of the need to defecate, or they may be so dehydrated that the

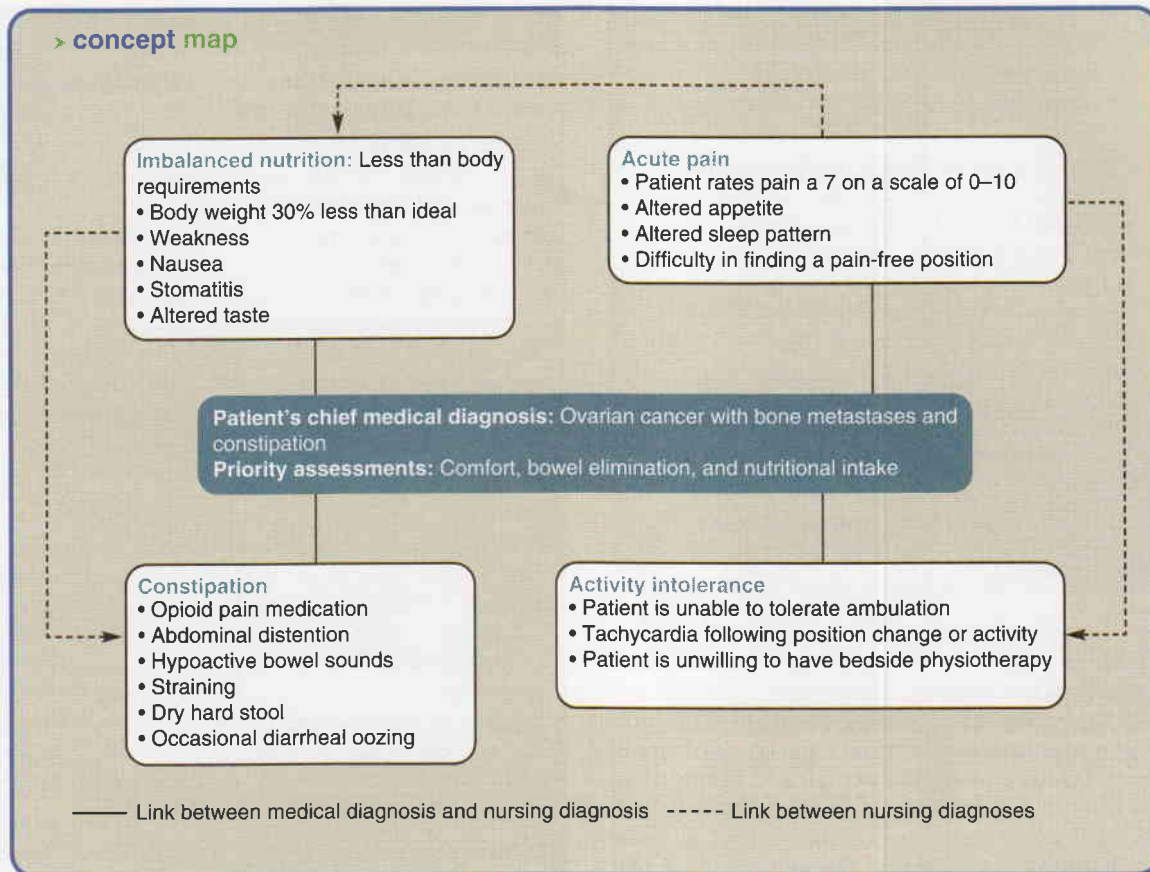


Figure 44-10 Concept map for a patient who has ovarian cancer with bone metastases and constipation.

► BOX 44-4 NURSING DIAGNOSTIC PROCESS

Assessment Activities	Defining Characteristics	Nursing Diagnosis
Inspect the abdomen for shape, symmetry.	Distended abdomen.	Diarrhea related to gastrointestinal disorder.
Auscultate for bowel sounds.	Bowel sounds are hyperactive and audible without a stethoscope.	
Percuss for general tympany.	Hyperresonance is present with gaseous distension.	
Assess frequency of stools.	Patient reports having more than three loose bowel movements a day, accompanied by muscle cramps.	
Assess hydration status.	Loss of skin turgor and dry mucous membranes.	
Have the patient describe the pain, cramping, or any associated factors.	Pain is colicky in nature and spasmodic.	
Evaluate the perianal area for redness and irritation.	Breakdown of perianal tissues.	

Sources: Ackley, B., & Ladwig, G., (Eds.). (2011). *An evidence-based guide to planning care* (9th ed.). St Louis, MO: Mosby Elsevier; and Jarvis, C., Browne, A., MacDonald-Jenkins, J., & Luctkar-Flude, M. (Eds.). (2009). *Physical examination and health assessment* (1st Canadian ed.). Toronto: Elsevier Canada.

stool is too hard and too dry to pass. High intake of fibre or cellulose without accompanying fluids can increase the risk of impaction.

An obvious sign of impaction is the inability to pass a stool for several days, despite the repeated urge to defecate. A

continuous oozing of diarrhea stool may develop when the liquid portion of feces located higher in the colon seeps around the impacted mass. Loss of appetite (anorexia), nausea or vomiting, abdominal distension and cramping, and rectal pain may accompany the condition. If you suspect an impaction, you

► BOX 44-5 Common Causes of Constipation

- Ignoring the urge to defecate
- Sedentary lifestyle, including lengthy bed rest or lack of regular exercise
- A low-fibre diet high in animal fats (e.g., meats, dairy products, eggs) and refined sugars (e.g., rich desserts)
- A low noncaffeinated fluid intake
- Prolonged and overuse of laxatives
- Polypharmacy
- Comorbidities such as Parkinson's disease, multiple sclerosis, rheumatoid arthritis, chronic bowel diseases, depression, eating disorders, hypothyroidism, hypocalcemia, or hypokalemia
- Neurological conditions that block the nerve impulse to the colon (e.g., spinal cord injuries, tumours)

Sources: Ginsberg, D. A., Phillips, S. F., Wallace, J., & Josephson, K. L. (2007). Evaluating and managing constipation in the elderly. *Urologic Nursing*, 27, 191–200; and Registered Nurses' Association of Ontario. (2011). *Prevention of constipation in the older adult population*. Toronto: Registered Nurses' Association of Ontario.

can gently perform a digital examination of the rectum and palpate for the impacted mass.

Diarrhea. Diarrhea is an increase in the number of stools (several bowel movements per day) and the passage of liquid, unformed feces. Diarrhea can be acute or chronic. Diarrhea can be caused by infectious organisms (as discussed above), food intolerances, medications (including chemotherapy), or intestinal disease. Intestinal contents pass through the small and large intestine too quickly to allow the usual absorption of fluid and nutrients. Irritation within the colon can result in an increased mucus secretion. As a result, feces become watery and the patient may be unable to control the urge to defecate (Hannon & Porth, 2010).

Excess loss of colonic fluid can result in serious fluid, electrolyte, or acid–base imbalances. Older adults are particularly susceptible to complications associated with diarrhea (see Chapter 39). Repeated passage of diarrhea stools exposes the skin of the perineum and the buttocks to irritating intestinal contents; therefore, meticulous skin care and containment of fecal drainage is needed to prevent skin breakdown (see Chapter 37) (Hannon & Porth, 2010).

The aims of treatment are to remove the precipitating conditions and to slow peristalsis. Drugs that are opiumlike (such as loperamide) are used to decrease gastrointestinal motility and stimulate water and electrolyte absorption. Antidiarrheal medications should not be used with patients who have blood in their stool or a high fever, because they could risk worsening the disease. Antibiotics are used only when enteric pathogens have been identified (Hannon & Porth, 2010).

Communicable food-borne pathogens can also cause diarrhea. The risk of food-borne illnesses can be greatly reduced by handwashing after using the bathroom and before and after preparing foods, and by properly storing and preparing fresh produce and meats. When diarrhea is the result of a food-borne virus, the goal is usually to rid the system of the pathogen, not to slow peristalsis.

Incontinence. Fecal incontinence is the inability to control the passage of feces and gas from the anus. Fecal incontinence is devastating to patients and has a significant effect on functional, social, and psychological well-being (Bliss et al., 2004). The possible embarrassment of soiling clothes can lead

* BOX 44-6 RESEARCH HIGHLIGHT

Constipation in Older Adults During an Acute Hospital Stay

Research Focus

Bowel problems during hospitalization can be common and distressing in older adults. In some cases, hospital stays can be lengthened if constipation is not addressed. The majority of guidelines and research done on constipation in older adults focus on patients in a long-stay hospital or in long-term care. Very few studies have been done on factors that predict the onset of constipation in the acutely hospitalized older adult. Identifying factors that precipitate constipation during an acute hospital stay would facilitate starting a specific, preventative care plan for constipation early in an older adult's hospital stay.

Research Abstract

The purpose of the study by Cardin et al. (2009) was to identify any factors predicting the onset of constipation in the acutely hospitalized older patients. The goal was then to create an evidence-based identification of which patients need early preventative measures. The study involved 192 patients over the age of 67 who were consecutively admitted for various medical conditions to an acute care ward in an Italian hospital. All patients were interviewed upon arrival, and detailed information was collected about their physical health, mental status, dietary problems, medication use, and consistency of feces. Information on constipation and medication use during their hospital stay was also collected.

Evidence-Informed Practice

- Use of laxatives at home was a factor in constipation during the hospital stay.
- Satisfaction with bowel movements is reduced in patients who must stay in bed for lengthy periods of time during their hospitalization.
- Patients who have had cerebrovascular accidents are also more unsatisfied with their bowel movements during their hospital stay.
- Nurses working in acute care should assess their patients for at-home laxative use upon admission and put in place a plan to prevent constipation for patients who used laxatives at home, are likely will remain in bed for longer than two weeks, or who have had a cerebrovascular accident.

Reference: Cardin, F., Minicuci, N., Droghi, A. T., Inelmen, E. M., Sergi, G., & Terranova, O. (2009). Constipation in acutely hospitalized older patients. *Archives of Gerontology and Geriatrics*, 50, 277–281. doi:10.1016/j.archger.2009.04.007.

to self-imposed social isolation (Skelly et al., 2006). Contributing factors to fecal incontinence include diet, fluid intake (in particular, caffeine), alcohol, and nicotine (Skelly et al., 2006). Physical conditions that impair anal sphincter function, compliance, or control can cause incontinence. Additionally, patients without the cognitive awareness of the urge to defecate are at risk for incontinence (Skelly et al., 2006). Conditions that create frequent, loose, large-volume, watery stools are predispositions for fecal incontinence (Bliss et al., 2000). Fecal incontinence can be successfully managed and treated with nursing intervention (Box 44-7).

Flatulence. In most healthy individuals, 100 to 200 mL of gas is present in the GI tract. Gas in the upper GI tract may increase from the swallowing of air. Gas production in the colon occurs from bacteria digesting cellulose in the colon.



BOX 44-7 NURSING STORY

Fecal Incontinence Is a Treatable Condition

I often hear from patients that refer themselves to the Continence Care Clinic that they had been told that fecal incontinence was just something to “put up with” as they got older. No matter how many times I hear this from older adults, it still surprises me that, given the wealth of quality research on strategies to promote continence, many health care providers—and consequently the public—think nothing can be done. Attitudes like this prevent older adults from seeking help for this treatable condition. In fact, patients with fecal incontinence more frequently avoid seeking medical care than those with constipation (Siproudhis et al., 2006).

I recently had the privilege of working with a patient on regaining her fecal continence. She had been experiencing problems with constipation most of her adult life and recently, in her 80s, had begun to have difficulty with emptying and fecal soiling. Her bowel movements were unpredictable as to the time of day, and the consistency varied from a Type 1 on the Bristol Stool Chart to a Type 6. She had a low dietary fibre intake because she felt too much fibre would exacerbate her condition (a common myth), and she drank mostly tea during the day. She took more than eight medications for other comorbidities, including an osmotic laxative.

Working together, we determined that the contributing factors to her fecal incontinence were low fluid intake, low dietary fibre, lack of bowel routine, polypharmacy, and a weak pelvic floor. Our mutually established conservative plan included drinking at least four to five 8-ounce glasses of water over the course of the day, gradually increasing her dietary fibre with the goal over time to achieve about 25 mg of fibre per day, limiting her caffeine intake to one to two cups a day, and allowing time after her morning meal to sit comfortably to have a bowel movement.

Gradually, over the next 12 weeks, with support and coaching, my patient successfully eliminated her fecal incontinence. She was so grateful for my support and remarked at what a positive difference being continent made to her quality of life and self-esteem. She was so relieved to be able to go about her daily activities without worrying about whether she would have an embarrassing accident. These successes make my work as a Nurse Continence Advisor so rewarding.

As gas accumulates in the lumen of the intestines, the bowel wall stretches and distends, resulting in **flatulence**. Flatulence is a common cause of abdominal fullness, pain, and cramping. Normally, intestinal gas escapes through the mouth (belching) or the anus (passing of flatus). For a person eating a normal diet, 50 to 500 mL of gas is passed 10 to 15 times a day. However, if intestinal motility is reduced as a result of the effects of opiates, general anaesthetics, abdominal surgery, or immobilization, flatulence can become severe enough to cause abdominal distension and severe, sharp pain (Lewis et al., 2010).

Hemorrhoids. Hemorrhoids are dilated, engorged veins in the lining of the rectum. They are either external or internal. External hemorrhoids are clearly visible as protrusions of skin. If the underlying vein is hardened, a purplish discoloration (i.e., thrombosis) may be visible. This condition causes increased pain, and the hemorrhoid may need to be excised. Internal hemorrhoids have an outer mucous membrane. Increased venous pressure as a result of pregnancy, heart failure, chronic liver disease, or straining at defecation can cause hemorrhoids. The presence of hemorrhoids is frequently accompanied by fecal soiling of undergarments and irritation

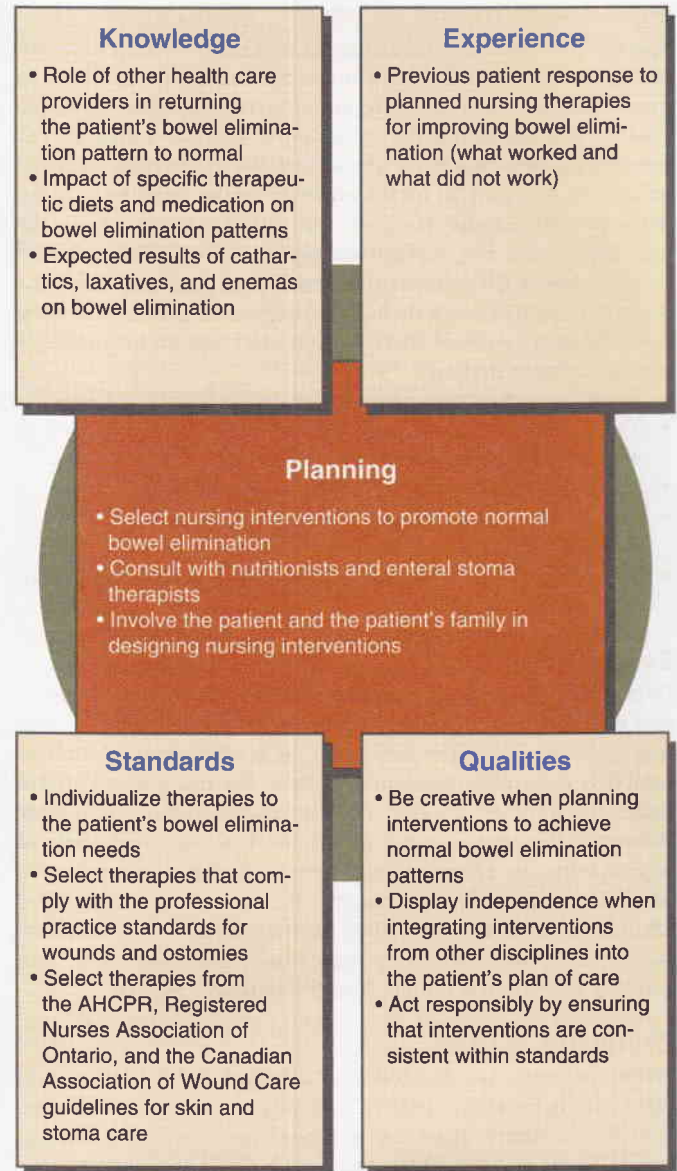


Figure 44-11 Critical thinking model for bowel elimination planning.

of the distended veins by overly vigorous cleaning of the anus. Meticulous cleaning following a bowel movement may reduce the possibility of irritation (Lewis et al., 2010).

❖Planning

During the planning of care, you synthesize information from multiple resources (Figure 44-11). Critical thinking ensures that the plan of care integrates all you know about the patient and the clinical problem. You must rely on professional standards. The guidelines on incontinence (see Chapter 43) can assist you in protecting the patient's skin, promoting continence, and reducing the embarrassment associated with incontinence. In addition, the Agency for Health Care Policy and Research (AHCPR), the Registered Nurses' Association of Ontario (RNAO), and the Canadian Association of Wound Care (CAWC) have guidelines on the reduction of pressure ulcers that also assist in developing care for patients with bowel incontinence (see Chapter 46).

Goals and Outcomes

You and the patient establish goals and outcomes by incorporating the patient's bowel elimination habits or routines as much as possible and by reinforcing routines that promote health. You also consider preexisting health concerns. For example, if the patient is at risk for the worsening of heart failure, an outcome of increased fluid intake must be tailored to the patient's cardiac function and ability to safely handle the increased fluid. For another example, if the patient's bowel habits caused the elimination problem, you can help the patient to learn new bowel habits. The overall goal of returning the patient to a normal bowel elimination pattern may include the following outcomes:

- The patient practises regular defecation habits.
- The patient lists the proper fluid and food intake needed to achieve regular bowel elimination.
- The patient implements a regular exercise program.
- The patient reports daily passage of soft, formed brown stool.
- The patient does not report any discomfort associated with defecation.

Setting Priorities

Defecation patterns vary among individuals. For this reason, you and the patient must work together closely to plan effective interventions (see Box 44-8). A realistic time frame to establish a normal defecation pattern for one patient might differ for another patient. For the patient who has a new ostomy as the result of newly diagnosed cancer, the priority of coping with cancer and its treatment may precede the patient's need to independently manage the bowel diversion. For another patient, however, when a bowel diversion is necessary, coping with the changes in body image may become a high priority for both the patient and the patient's family.

Continuity of Care

When patients are disabled or debilitated by illness, you need to include the patient's family in the plan of care. Family members often have the same bowel elimination habits as the patient. Thus, teaching both the patient and the patient's family is an important part of the care plan. Other health team members, such as dietitians and enterostomal therapist (ET) nurses, can be valuable resources. When patients require surgical intervention, a critical pathway may be used to coordinate the activities of the multidisciplinary health care team.

The patient who has alterations in bowel elimination will require intervention from many members of the health care team. Certain tasks, such as assisting patients onto the bedpan or bedside commode, are appropriate to delegate to unregulated care providers (UCPs). Remind the UCP to report any abnormal findings or difficulties encountered during the bowel elimination process. Non-nursing personnel perform many of the diagnostic tests used to evaluate the gastrointestinal system. You must maintain ongoing communication with these caregivers to ensure that the patient's safety, needs, wants, and concerns are addressed.

Implementation

The success of your interventions depends on improving the patient's and the family members' understanding of bowel elimination. In the home, hospital, or long-term care facility,

patients capable of learning can be taught effective bowel habits.

Teach the patient and the patient's family about proper diet, adequate fluid intake, and factors that stimulate or slow peristalsis, such as emotional stress. The patient should also learn the importance of establishing regular bowel routines, participating in regular exercise, and taking appropriate measures when bowel elimination problems develop.

Patient Expectations

Patients expect you to answer all their questions regarding diagnostic tests and the preparation for those tests. Patients will be concerned about discomfort and exposure. Fear of losing control of their bowel elimination is especially worrisome. Patients need reassurance that their needs will be met and that you are supportive. Patients expect a knowledgeable nurse who can teach them methods of promoting and maintaining a normal bowel elimination pattern.

Management of Bowel Elimination

One of the most important habits you can encourage patients to establish is a daily bowel routine that includes adequate fluid and food intake as well as regular exercise. The urge to defecate usually occurs within an hour following a meal, after breakfast being the most common time for most individuals. Having access to a bathroom, privacy, and a comfortable seated position are all factors in the routine. Many patients have their established routines for defecation at home, which can become disrupted if they are ill. In a hospital or long-term care facility, ensure that treatment routines do not interfere with the patient's bowel elimination routine. The provision of privacy is important to maintain. When a patient shares the room with other patients, pull the curtain around the area so the patient can relax, with the knowledge that interruptions will not occur. The call light should always be placed within the patient's reach. Bathroom doors should be closed, although you may stand close by in case the patient needs assistance.

Maintenance of Proper Fluid and Food Intake. Daily fluid intake should be between 1500 and 2000 mL per day of noncaffeinated beverages. Dietary fibre intake should be from 25 to 30 g per day. In choosing a diet to promote normal bowel elimination, you need to consider the frequency of defecation, the characteristics of the feces, and the types of foods that impair or promote defecation. The patient with frequent constipation or impaction requires an increased intake of high-fibre foods and more fluids. The patient needs to understand that diet therapy is only one factor to consider and may not give immediate relief from problems such as constipation.

Many evidence-informed interventions are available to reduce the risk of constipation (Box 44-9) (RNAO, 2011).

If diarrhea is a problem, then foods with a low-fibre content such as applesauce, bananas, and rice will reduce gastric upset or abdominal cramping. Diarrhea caused by illness can be debilitating. If the patient cannot tolerate foods or liquids orally, intravenous therapy (with potassium supplements) is necessary. The patient returns to a normal diet slowly, often beginning with fluids. Excessively hot or cold fluids stimulate peristalsis, thereby causing abdominal cramps and further diarrhea. As the tolerance to liquids improves, solid foods are ordered. Following a severe diarrheal episode, milk products may need to be withheld until the enterocyte population has matured. Milk products may have the effect of perpetuating the diarrhea.

► BOX 44-8 NURSING CARE PLAN

Constipation

Assessment

Javier is a nurse who visits Larry at his home on a cattle ranch. Larry lives 40 km from town. He is 22 years old and had surgery six days ago for repair of a broken right leg. Larry tells Javier, "I just don't feel good."

Assessment Activities

Ask Larry about his recent bowel elimination patterns over the last five days.

Review Larry's medication.

Review Larry's dietary intake over the past day.

Ask about any nausea or vomiting.

Auscultate the abdomen.

Palpate the abdomen.

Findings and Defining Characteristics

Larry has not had a bowel movement since he left the hospital four days ago and he feels like his abdomen is tight and sore.

Larry has been prescribed opioids for pain. He is taking them regularly, as prescribed.

Larry has eaten eggs, bacon, and toast for breakfast and soup for lunch. For supper, Larry had chicken, rice, and corn. He drinks about six cups of coffee each day, no water, but will drink a cola.

Larry has not felt nauseated.

Decreased bowel sounds are auscultated throughout all four abdominal quadrants.

While Javier is palpating Larry's abdomen, Larry tells Javier, "It really hurts." On palpation, the left lower quadrant is tender and firm.

Nursing Diagnosis: Constipation related to opiate-containing pain medication and decreased fibre intake.

Planning

Goals (Nursing Outcomes Classification)*

Bowel Elimination

Larry will establish normal defecation.

Larry will voice relief from constipation.

Expected Outcomes

Larry will drink at least 1500 mL of fluid over the next eight hours.

Larry will report passage of soft stool without straining within 24 hours.

Nutritional Status: Food and Fluid Intake

Larry will identify measures to prevent constipation.

Larry will increase the amount of daily exercise.

Larry will increase the fibre content of his diet.

*Outcome classification labels from Ackley, B., & Ladwig, G. (Eds.). (2011). *An evidence-based guide to planning care* (9th ed.). St Louis, MO: Mosby Elsevier.

Interventions

Constipation or Impaction Management

Encourage fluid intake of fruit juice, water, and other appropriate fluids.

Encourage activity within the limits of Larry's mobility regimen.

Add bran flakes or bran to the diet.

Provide laxative or stool softeners as ordered.

Provide a private atmosphere for bowel elimination.

Rationale

Adequate fluid intake is necessary to prevent hard, dry stool.

Even minimal activity (such as leg lifts) increases peristalsis.

The number of bowel movements is increased with consumption of bran (Bliss et al., 2001).

Medications can soften the stool and prevent straining (Lilley et al., 2011).

Patients should feel relaxed when moving their bowels.

Continued

► BOX 44-8 NURSING CARE PLAN—cont'd

Evaluation

Nursing Actions

Ask Larry to identify foods high in fibre.

Ask Larry to plan menus to increase fibre.

Ask Larry about increased activity.

Observe Larry's subsequent stool for characteristics such as consistency and colour.

Patient Response and Findings

Larry is able to correctly identify high-fibre foods. Review of the 24-hour diet diary shows Larry is selecting high-fibre, low-fat foods.

Review of the 24-hour diet diary shows meals planned with high-fibre content. Larry reviews his shopping list, which includes bran, oat, and fruit products.

Larry states that he has not changed his level of activity.

Stools are now every 24 to 48 hours. Larry states he does not "feel regular." The abdomen is soft and nondistended. Stools are formed and hard, and Larry reports straining.

Achievement of Outcome

Larry is making excellent progress in introducing high-fibre and low-fat foods into his diet.

Larry is knowledgeable about fibre content and purchases foods that are high in fibre.

Larry has not increased his level of activity and needs to continue to work on increasing his physical activity.

Larry has not achieved passage of a regular, formed stool.

* BOX 44-9 EVIDENCE-INFORMED PRACTICE GUIDELINE

Prevention of Constipation in the Older Adult Population

- Fluid intake of at least 1500 to 2000 mL per day is recommended. The preferred fluid is water because it is sodium-free and calorie-free. The patient may also benefit from drinking one to two glasses of fruit juice.
- Coffee, tea, and alcohol should be avoided because of their diuretic properties.
- A high-fibre diet (25 to 30 g/day) reduces constipation; fibre that passes through the colon acts as a sponge. As a result, bulkier and softer stools develop. In addition, the waste moves through the body more easily and results in more regular bowel movements. A high-fibre diet is not recommended for individuals who are immobile or who do not consume at least 1.5 L of fluid per day.
- The most beneficial means to prevent constipation is a combination of insoluble and soluble fibre (e.g., bran, fruits, and vegetables).
- Physical activity in combination with adequate fluid intake and a high-fibre diet is beneficial in the management of constipation. For patients who are fully mobile, walking once or twice a day for 15 to 20 minutes is sufficient.
- For individuals who are unable to walk, recommend chair or bed exercises, such as the pelvic tilt, low trunk rotation, and single leg lifts.
- Laxatives should be used with caution. If laxatives are necessary, a stepwise progression is recommended: first bulk-forming laxatives, followed by stool softeners, osmotics, stimulants, suppositories, and enemas as a last resort.



Source: Adapted from Registered Nurses' Association of Ontario. (2011). *Prevention of constipation in the older adult population*. Toronto: Registered Nurses' Association of Ontario.

Promotion of Regular Exercise. A daily exercise program helps prevent bowel elimination problems. Walking, riding a stationary bicycle, or swimming stimulates peristalsis. Patients who are sedentary at work are most in need of regular exercise. For patients with mobility problems, such as arthritis, a passive exercise program may be helpful.

For a patient who is temporarily immobilized, you should attempt ambulation of the patient as soon as possible. If the condition permits, assist a postoperative patient in walking to a chair on the evening of the day of surgery. The patient should walk farther each day.

Exercises can help bedridden patients to more comfortably use a bedpan. The patient can practise the following exercises:

- Lie supine; tighten the abdominal muscles as though pushing them to the floor. Hold them tight to the count of three; relax. Repeat 5 to 10 times as tolerated.
- Flex and contract the thigh muscles by raising one knee slowly toward the chest. Repeat for each leg at least five times and increase the frequency as tolerated.

Bowel Retraining. The patient with incontinence is unable to maintain bowel control. A **bowel retraining** program can help some patients achieve normal defecation, especially those who still have some neuromuscular control.

The training program involves setting up a daily routine. By attempting to defecate at the same time each day and by using measures that promote defecation, the patient gains control of the bowel reflexes. The program requires time, patience, and consistency. Be sure to determine the patient's physical readiness and ability to benefit from bowel training. A successful program includes the following:

- Assessing the patient's normal bowel elimination pattern and recording times when the patient is incontinent
- Choosing a time based on the patient's pattern to initiate defecation-control measures by assisting the patient to the toilet at the designated time
- Offering a hot drink (e.g., tea), fruit juice (e.g., prune juice), or another fluid that normally stimulates peristalsis for the patient before the selected defecation time

- Instructing the patient to avoid medications such as analgesics, which may increase constipation
- Providing privacy and setting a time limit for the defecation (15 to 20 minutes)
- Instructing the patient to lean forward at the hips while sitting on the toilet, to apply manual pressure with the hands over the abdomen, and to bear down but not to strain to stimulate the colon to empty
- Refraining from making critical remarks or conveying frustration if the patient is unable to defecate
- Providing regular meals with adequate fluids and fibre (Bliss and Norton, 2010).
- Maintaining normal exercise within the patient's physical ability.

Hemorrhoids. Many patients experience discomfort from alterations in their bowel elimination. Pain results when hemorrhoid tissues are directly irritated. The primary goal for the patient with hemorrhoids is to have soft-formed, painless bowel movements. Proper diet, fluids, and regular exercise improve the likelihood of the stools being soft. If the patient becomes constipated, passage of hard stools may cause bleeding and irritation. Local heat provides temporary relief to swollen hemorrhoids. A sitz bath is the most effective means of heat application.

Maintenance of Skin Integrity. The patient with diarrhea or fecal incontinence is at risk for skin breakdown when fecal contents remain on the skin. Liquid stool is usually acidic and contains digestive enzymes. Irritation from repeated wiping with toilet tissue aggravates the breakdown of skin. Bathing the skin after soiling helps but may result in more breakdown unless the skin is thoroughly dried.

When caring for an incontinent patient who is unable to ask for assistance, you should check often for defecation. The anal areas can be protected with barrier cream that holds moisture in the skin to prevent drying and cracking. Yeast infections of the skin can develop easily. Several powdered antifungal agents are effective against yeast. Baby powder or cornstarch should not be used because they have no medicinal properties and they frequently cake on the skin, which makes them difficult to remove.

Medications. Medications may be used to initiate and facilitate bowel elimination. Cathartics, laxatives, and occasionally an enema are used to control constipation, whereas antidiarrheal preparations assist the patient in resolving diarrhea. All these medications are available over the counter; stronger preparations are available through prescriptions. Patients must be cautioned not to use these over-the-counter medications on a prolonged basis without consulting their health care provider.

Laxatives are defined as products that stimulate evacuation of the formed stool from the rectum, whereas **cathartics** are defined as products that evacuate unformed and usually watery fecal material from the entire colon. Laxatives are thus milder in action than cathartics. When used correctly, laxatives and cathartics safely maintain normal bowel elimination patterns; however, chronic use of cathartics causes the large intestine to lose muscle tone and to become less responsive to stimulation by laxatives. Laxative overuse can also cause serious diarrhea that can lead to dehydration and electrolyte depletion. Mineral oil, a common laxative, decreases fat-soluble vitamin absorption. Laxatives can influence the efficacy of other medications by altering the transit time (i.e., the

time the medication remains in the GI tract and is available for absorption).

safety alert Excessive use of laxatives, enemas, or bulk-forming agents increases the patient's risk for diarrhea and abnormal bowel elimination and destroys the patient's normal defecation reflex. In addition, the patient may develop an altered absorption of nutrients, fluid and electrolyte imbalances, and generalized weakness. When these symptoms occur in chronically ill or older adult patients, they may result in an increased risk for falls and other injuries.

Cathartics and Laxatives. A patient is often unable to defecate normally because of pain, constipation, or impaction. Cathartics and laxatives provide the short-term action of emptying the bowel. They are also used in bowel evacuation for patients undergoing GI tests and abdominal surgery. Although the terms *cathartic* and *laxative* are often used interchangeably, cathartics have a stronger effect on the intestines. Five types of laxatives and cathartics are available (Table 44-5).

Cathartics and laxatives are available in oral, tablet, and powder suppository dosage forms (see Chapter 33). Although the oral route is most commonly used, cathartics that are prepared as suppositories are more effective because of their stimulant effect on the rectal mucosa. Cathartic suppositories such as bisacodyl (Dulcolax) can act within 30 minutes. Older adults who use Dulcolax often have a strong, sudden urge to defecate.

Electrolyte Balance and Antidiarrheal Agents. For patients with diarrhea, frequent passage of liquid stools becomes a problem. When a person has secretory diarrhea, cells at the base of the villi secrete massive amounts of fluid into the lumen of the small intestine. However, the tip of the villi can still absorb sugars and fluids. Therefore, diarrhea can quickly lead to serious electrolyte imbalances, particularly in infants and children (see Chapter 39). Therefore, the first course of action is to immediately replace fluids by mouth. Fluids with adequate electrolyte content (e.g., Pedialyte and Gastrolyte) are a wise choice. In developing countries without a safe water supply or during epidemics of infectious diarrhea (e.g., cholera), millions of lives have been saved by using a cheap, safe, and simple method of replacing water and salts lost through diarrhea. This method, known as oral rehydration therapy (ORT), involves mixing a very low-cost package of salts (sodium, potassium chloride, citrate or bicarbonate, and glucose) with boiled water.

Many patients will use over-the-counter agents, such as Imodium, to relieve common diarrhea. However, the most effective antidiarrheal agents are prescriptive opiates, such as codeine phosphate, opium tincture (Paregoric), and diphenoxylate (Lomotil). Opiates inhibit the peristaltic waves that move feces forward but also increase the segmental contractions that mix intestinal contents and expose the contents to the mucosal absorbing surface. The further effect of opiates on increasing the absorption of sodium and water also dries out the feces. As a result, more water is absorbed by the colonic mucosa. These antidiarrheal agents should be used with caution because opiates are habit forming.

Enemas. An **enema** is the instillation of a solution into the rectum and sigmoid colon. The primary reason for using an enema is to promote defecation by stimulating peristalsis. The volume of fluid instilled breaks up the fecal mass, stretches the rectal wall, and initiates the defecation reflex. Enemas are

► **TABLE 44-5** Common Types of Laxatives and Cathartics

Agents and Brand Names	Action	Indications	Risks
Bulk Forming			
Methylcellulose (Benefibre)	The high-fibre content absorbs water and increases solid intestinal bulk.	These agents are the least irritating, most natural, and safest cathartics. These agents are the drugs of choice for treating chronic constipation (e.g., during pregnancy or as the result of a low-residue diet).	These agents can cause obstruction if not mixed with at least 240 mL of water or juice and swallowed quickly.
Psyllium (Metamucil)	These agents stretch the intestinal wall to stimulate peristalsis.	These agents may also be used to relieve mild, watery diarrhea.	Use caution with bulk-forming laxatives that also contain stimulants. These agents are not used in patients for whom large fluid intake is contraindicated.
Emollient or Wetting			
Docusate sodium (Colace) Docusate calcium (Surfak)	Stool softeners are detergents that lower the surface tension of feces, allowing water and fat to penetrate. They may increase the secretion of water by the intestines.	These agents are used for short-term therapy to relieve straining on defecation. These agents would be beneficial for patients who have hemorrhoids, have undergone perianal surgery, are pregnant, or are recovering from myocardial infarction.	These agents are of little value for treatment of chronic constipation.
Saline			
Magnesium citrate or citrate of magnesia (Citromag)	These agents contain a salt preparation that is not absorbed by the intestines.	These agents are used only for acute emptying of the bowel (e.g., as a preparation for endoscopic examination, in cases of suspected poisoning, or to treat acute constipation).	These agents are not used for long-term management of constipation.
Magnesium hydroxide (Milk of Magnesia)	The osmotic effect increases pressure in the bowel to act as stimulant for peristalsis.		These agents are contraindicated for patients with kidney dysfunction (to avoid a toxic buildup of magnesium).
Sodium phosphate (Fleet Enema)	Sodium phosphate		Phosphate salts are not used for patients on fluid restriction.
Stimulant Cathartics			
Bisacodyl (Dulcolax)	These agents irritate the intestinal mucosa to increase motility.	These agents may be used to prepare the bowel for diagnostic procedures.	These agents may cause severe cramping.
Castor oil (Neoloid, Purge)	These agents decrease absorption in the small bowel and colon.		These agents are not for long-term use.
Phenolphthalein (Doxidan, Correctol, Ex-Lax)	Phenolphthalein and danthron may cause pink or red urine.		
Lubricants			
Mineral oil (Haley's M-O, Petrogalar Plain)	These agents coat the fecal contents, which allows for easier passage of the stool. These agents reduce water absorption in the colon.	These agents are used to prevent straining on defecation (e.g., for patients who have hemorrhoids and for those who are recovering from perianal surgery).	These agents decrease the absorption of fat-soluble vitamins (A, D, E, and K). These agents can cause a dangerous form of pneumonia if aspirated into the lungs. Mineral oil when taken with emollients can increase the risk for fat emboli.

Source: Lilley, L. L., Harrington, S., Snyder, J. S., & Swart, B. (2011). *Pharmacology for Canadian health care practice* (2nd Canadian ed.). Toronto: Elsevier Canada.

also used as a vehicle for administering medications that exert a local effect on rectal mucosa.

The most common use for an enema is temporary relief of constipation. Other indications include removing impacted feces; beginning a program of bowel training; and emptying the bowel before diagnostic tests, surgery, or childbirth.

Cleansing Enemas. Cleansing enemas promote the complete evacuation of feces from the colon. They act by stimulating peristalsis through the infusion of a large volume of solution or through local irritation of the colon's mucosa. Solutions used in cleansing enemas include tap water, normal saline, low-volume hypertonic saline, and soapsuds solution. Each solution exerts a different osmotic effect to move fluids between the colon and the interstitial spaces beyond the intestinal wall. Infants and children should receive only normal saline because they are at risk for fluid imbalance.

A physician may order a high or low cleansing enema. The terms *high* and *low* refer to the height from which, and hence the pressure with which, the fluid is delivered. High enemas are given to cleanse the entire colon. After the enema is infused, the patient is asked to turn from the left lateral position to the dorsal recumbent position and to the right lateral position. The position change ensures that fluid reaches all of the large intestine. A low enema cleanses only the rectum and the sigmoid colon.

Tap Water. Tap water is hypotonic and exerts a lower osmotic pressure than that of fluid in interstitial spaces. After infusion into the colon, tap water escapes from the bowel lumen into the interstitial spaces. The net movement of water is low. The infused volume stimulates defecation before large amounts of water leave the bowel. Tap water enemas should not be repeated because water toxicity or circulatory overload can develop if large amounts of water are absorbed.

Normal Saline. Physiologically, normal saline is the safest solution to use because it exerts the same osmotic pressure as that of fluids in the interstitial spaces surrounding the bowel. The volume of infused saline stimulates peristalsis. Unlike tap water enemas, saline enemas do not create the danger of excess fluid absorption.

Hypertonic Solutions. Hypertonic solutions infused into the bowel exert osmotic pressure that pulls fluids out of the interstitial spaces. The colon fills with fluid, and the resultant distension promotes defecation. Patients unable to tolerate large volumes of fluid benefit most from this type of enema, which is, by design, low volume. Contraindications for this type of enema are patients who are dehydrated and young infants. A hypertonic solution of 120 to 180 mL is usually effective. The commercially prepared Fleet Enema is the most commonly used hypertonic solution.

Soapsuds. Soapsuds may be added to tap water or saline to create the effect of intestinal irritation to stimulate peristalsis. Only pure castile soap is safe to use. A liquid form of castile soap is included in most soapsuds enema kits. Harsh soaps or detergents can cause serious bowel inflammation.

Oil-Retention Enemas. Oil-retention enemas lubricate the rectum and colon. The feces absorb the oil and become softer and easier to pass. To enhance the action of the oil, the patient retains the enema for several hours if possible.

Other Types of Enemas. Carminative enemas provide relief from gaseous distension. Use of a carminative enema improves the ability to pass flatus. An example of a carminative enema is MGW solution, which contains 30 mL of magnesium, 60 mL of glycerine, and 90 mL of water.

Medicated enemas contain drugs. An example is sodium polystyrene sulphonate (Kayexalate), which is used to treat patients with dangerously high serum potassium levels. This drug contains a resin that exchanges sodium ions for potassium ions in the large intestine. Another medicated enema is neomycin solution, which is an antibiotic used to reduce bacteria in the colon before bowel surgery.

Enema Administration. Enemas are administered in either commercially packaged, disposable units or with reusable equipment prepared before use. Sterile technique is unnecessary because the colon normally contains bacteria; however, gloves should be worn to prevent the transmission of fecal microorganisms.

You should explain the procedure to the patient, including the position to assume, precautions to take to avoid discomfort, and the length of time necessary to retain the solution before defecation. If the patient is to receive the enema at home, explain the procedure to a family member.

Often the physician orders "enemas until clear." This order means that the enema is to be repeated until the patient passes fluid that is clear and contains no fecal material. As many as three enemas may be necessary, but you should caution the patient against more than three enemas. Excess enema use seriously depletes fluids and electrolytes. If the enema fails to return a clear solution after three times (check agency policy on the maximum number of enemas permitted) or if the patient seems to not be tolerating the rigors of repeated enemas, notify the physician.

Giving an enema to a patient who is unable to contract the external sphincter can pose difficulties. In these cases, give the enema with the patient positioned on the bedpan. Giving the enema with the patient sitting on the toilet is unsafe because the curved rectal tubing can abrade the rectal wall. Skill 44-1 outlines the steps for an enema administration.

safety alert For patients with an impaction, the fecal mass may be too large to be passed voluntarily. If enemas fail, you may consider breaking up the fecal mass with your finger and removing it in sections (Box 44-10). The procedure will be very uncomfortable for the patient. Excess rectal manipulation may cause irritation to the mucosa, bleeding, perforation of the bowel wall, and stimulation of the vagus nerve, which results in a reflex slowing of the heart rate. Because of the procedure's potential complications, a physician's order is necessary for you to remove a fecal impaction.

Surgical Management of Bowel Elimination

Inserting and Maintaining a Nasogastric Tube. A patient's condition or situation may warrant special interventions to decompress the GI tract. Such conditions include surgery, infections of the GI tract, trauma to the GI tract, and the absence of peristalsis.

A nasogastric (NG) tube is a pliable tube that is inserted through the patient's nasopharynx into the stomach. The tube has a hollow lumen that allows removal of gastric secretions and introduction of solutions into the stomach. Nasogastric intubation has several purposes (Table 44-6).

The Levin and Salem sump tubes are the most common tubes used for stomach decompression. The Levin tube is a single-lumen tube with holes near the tip. A sump tube may be connected to either a drainage bag or an intermittent suction device to drain stomach secretions.

► SKILL 44-1 Administering a Cleansing Enema



Delegation Considerations

The skill of administering an enema can be delegated to unregulated care providers (UCPs). You have the responsibility to assess the patient for specific considerations, such as his or her safety, the need for alternative positioning and comfort, and the presence of stable vital signs prior to the procedure. In addition, you have the responsibility to determine the patient's response to the enema. If delegating this task to a UCP:

- Inform and assist the UCP in the proper way to position patients who have mobility restrictions, such as patients with arthritis or severe fatigue.
- Instruct the UCP how to position patients who have therapeutic equipment present, such as drains, intravenous catheters, or traction.
- Instruct the UCP about the specific signs and symptoms that will appear in patients not tolerating the procedure and about when the procedure must be stopped. For example, these signs and symptoms may include abdominal pain more than a pressure sensation, abdominal cramping, abdominal distension, or rectal bleeding.

Equipment

- Clean gloves
- Water-soluble lubricant
- Waterproof, absorbent pads
- Bath blanket
- Toilet tissue
- Bedpan, bedside commode, or access
- Washbasin, washcloths, towel
- Intravenous (IV) pole
- Enema bag administration
- Enema container
- Tubing and clamp (if not already attached to the enema container)
- Appropriate size rectal tube: 22 to 30 Fr
- Correct volume of warmed solution: 750 to 1000 mL
- Prepackaged enema
- Prepackaged enema container with rectal tip

Procedure

STEPS

1. Assess the status of the patient: last bowel movement, normal bowel patterns, presence of hemorrhoids, mobility, external sphincter control, and abdominal pain.
2. Assess the patient for presence of increased intracranial pressure, glaucoma, or recent rectal or prostate surgery.
3. Check the patient's medical record to clarify the rationale for the enema.
4. Review the physician's order for the enema.
5. Determine the patient's level of understanding of the purpose of the enema.
6. Perform hand hygiene. Collect appropriate equipment.
7. Correctly identify the patient and explain the procedure.
8. Assemble the enema bag with the appropriate solution and rectal tube.
9. Perform hand hygiene and apply gloves.
10. Provide privacy by closing the curtains around the bed or by closing the door.
11. Raise the bed to an appropriate working height; raise the side rail on the patient's left side.
12. Assist the patient into a position lying on the left side with right knee flexed (i.e., Sims' position).

RATIONALE

- Your assessment determines the factors indicating a need for enema and influences the type of enema used.
- These conditions contraindicate the use of an enema.
- You need to determine the purpose of the enema administration, either as a preparation for a special procedure or for relief of constipation.
- An order by a physician is required. The order determines the number and type of enemas to be given.
- The patient's current level of understanding allows you to plan for appropriate teaching measures.
- Proper hand hygiene reduces the transmission of microorganisms.
- Explaining the procedure promotes patient cooperation and reduces anxiety.
- Proper hand hygiene reduces the transmission of microorganisms.
- Privacy reduces the embarrassment for the patient.
- Raising the bed and use of the side rail promote good body mechanics and patient safety.
- The Sims' position allows the enema solution to flow downward by gravity along the natural curve of the sigmoid colon and rectum, thus improving retention of the solution.

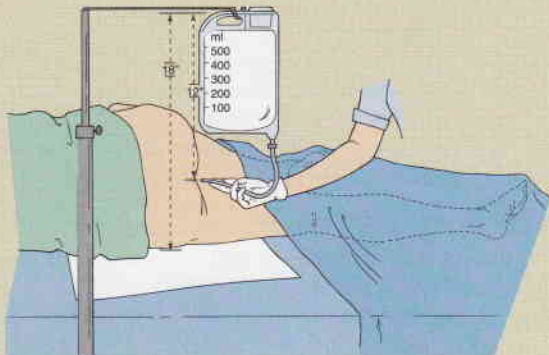
Critical Decision Point: Patients who have poor sphincter control will have difficulty retaining the enema solution. If the patient is suspected of having poor sphincter control, position the patient on a bedpan.

13. Place a waterproof pad under the hips and buttocks.
14. Cover the patient with a bath blanket, exposing only the rectal area, with the anus clearly visible.
15. Place the bedpan or commode in an easily accessible position. If the patient will be expelling contents in toilet, ensure the toilet is available. (If the patient will be walking to the bathroom to expel the enema, place the patient's slippers and bathrobe in an easily accessible position.)
16. Administer the enema:
 - A. Enema bag
 - A waterproof pad prevents soiling of the bed linen.
 - The bath blanket provides warmth, reduces exposure of body parts, and allows the patient to feel more relaxed and comfortable.
 - A bedpan or commode should be nearby in case the patient is unable to retain the enema solution.

► SKILL 44-1 Administering a Cleansing Enema—cont'd

video

- (1) Add warmed solution to the enema bag: warm the tap water as it flows from faucet, place the saline container in a basin of hot water before adding saline to the enema bag, check the temperature of the solution with a bath thermometer or by pouring a small amount of solution over your inner wrist.
- (2) Raise the container, release the clamp, and allow the solution to flow long enough to fill the tubing.
- (3) Reclamp the tubing.
- (4) Lubricate 6 to 8 cm of the tip of the rectal tube with lubricating jelly.
- (5) Gently separate the buttocks and locate the anus. Instruct the patient to relax by breathing out slowly through the mouth.
- (6) Insert the tip of the rectal tube slowly by pointing the tip in the direction of the patient's umbilicus (see Step 16A[6] illustration) for about 7 to 10 cm.



Step 16A(6) Insertion of a rectal tube into the rectum.

Critical Decision Point: If the tube does not pass easily, do not force it. Consider allowing a small amount of fluid to infuse and then try reinserting the tube slowly.

- (7) Hold the tubing in the rectum constantly until the end of the fluid instillation.
 - (8) Open the regulating clamp and allow the solution to enter slowly with the enema container at the patient's hip level.
 - (9) Raise the height of the enema container slowly to the appropriate level above the anus: 30 to 45 cm for a high enema, 30 cm for a regular enema, 7.5 cm for a low enema (see Step 16A[6] illustration). Instillation time varies depending on the volume of solution administered.
 - (10) Lower the container or clamp tubing if the patient complains of cramping or if fluid escapes around the rectal tube.
 - (11) Clamp the tubing after all solution is instilled.
- B. Prepackaged disposable container**
- (1) Remove the plastic cap from the rectal tip. The tip is already lubricated, but more jelly can be applied as needed.
 - (2) Gently separate the buttocks and locate the rectum. Instruct the patient to relax by breathing out slowly through mouth.
 - (3) Insert the tip of the bottle gently into the rectum about 7 to 10 cm.
 - (4) Squeeze the bottle until all the solution has entered the rectum and colon. Instruct the patient to retain the solution until the urge to defecate occurs, usually within two to five minutes.

- Hot water can burn intestinal mucosa. Cold water can cause abdominal cramping and is difficult to retain.
- Raising the container removes air from the tubing.
- Reclamping prevents further loss of the solution.
- The lubricating jelly allows smooth insertion of the rectal tube without risk of irritation or trauma to the mucosa.
- Exhaling promotes relaxation of the external anal sphincter.
- Careful insertion prevents trauma to the rectal mucosa from an accidental lodging of the tube against the rectal wall. Insertion beyond the proper limit can cause bowel perforation.

- Bowel contractions can cause expulsion of the rectal tube.
- Rapid instillation can stimulate evacuation of the rectal tube.
- Raising the height slowly allows for continuous, slow instillation of the solution. Raising the container too high causes rapid instillation and possible painful distension of the colon.
- Temporary cessation of instillation prevents cramping, but may prevent the patient from retaining all the fluid, thus altering the effectiveness of the enema.
- Clamping prevents entrance of air into the rectum.
- Lubrication provides for smooth insertion of rectal tube while avoiding rectal irritation or trauma.
- Breathing out promotes relaxation of the external rectal sphincter.
- Gentle insertion prevents trauma to the rectal mucosa.
- Hypertonic solutions require only small volumes to stimulate defecation.

Continued

► SKILL 44-1 Administering a Cleansing Enema—cont'd

video

17. Place layers of toilet tissue around the tube at the anus and gently withdraw the rectal tube.
 18. Explain to the patient that the feeling of distension is normal. Ask the patient to retain the solution for as long as possible while lying quietly in bed.
 19. Discard the enema container and tubing in the proper receptacle, or rinse thoroughly with warm soap and water if the container is to be reused.
 20. Assist the patient to the bathroom or help to position the patient on a bedpan.
 21. Observe the character of the feces and solution (caution the patient against flushing the toilet until you can inspect the feces).
- The use of toilet paper provides the patient with comfort and cleanliness.
 - The enema solution distends the bowel. The length of retention varies depending on the type of enema and the patient's ability to contract the rectal sphincter. Longer retention promotes more effective stimulation of peristalsis and defecation.
 - Proper handling of the used enema container and tubing reduces the transmission and growth of microorganisms.
 - The normal squatting position promotes defecation.
 - The character of the expelled feces determines the efficacy of the enema.

Critical Decision Point: When enemas are ordered “until clear,” observe the contents of the solution passed. Return is “clear” when no solid fecal material exists, but solution may be coloured.

22. Assist patient as needed to wash the anal area with warm soap and water (if providing perineal care, use gloves).
 23. Remove and discard gloves and perform hand hygiene.
 24. Inspect the colour, consistency, and amount of stool and fluid passed.
 25. Assess the condition of the abdomen; cramping, rigidity, or distension can indicate a serious problem.
- Fecal contents can irritate the skin. Proper hygiene promotes the patient's comfort.
 - Proper hand hygiene reduces the transmission of microorganisms.
 - The colour, consistency, and amount of stool determines whether the stool is evacuated or fluid is retained. Note any abnormalities, such as the presence of blood or mucus.
 - The condition of the abdomen determines whether distension is relieved. Excess volume can distend or perforate the bowel.

Unexpected Outcomes

Rigidity and distension of the abdomen

Abdominal pain or cramping

Bleeding

Related Interventions

- Stop the enema administration if fluid is still being instilled.
- Notify the physician and obtain vital signs.
- Slow the rate of instillation.
- Stop the enema administration.
- Notify the physician and obtain vital signs.

Recording and Reporting

- Record the type and volume of the enema given and the characteristics of the results.
- Report to the physician if the patient failed to defecate.

Home Care Considerations

- For patients who require enemas for bowel preparation at home, instruct the patient's family not to exceed the recommended fluid volume levels or the recommended number of enemas. Emphasize to the family members the need for slow administration of warmed fluid.

The Salem sump tube is preferable for stomach decompression. This tube has two lumina: one for removal of gastric contents (Figure 44-12) and one to provide an air vent. A blue “pigtail” is the air vent that connects with the second lumen. When the sump tube's main lumen is connected to suction, the air vent permits free, continuous drainage of secretions. The air vent should never be clamped off, connected to suction, or used for irrigation.

Bowel Diversions

Certain diseases cause conditions that prevent the normal passage of feces through the rectum. The treatment for these disorders may result in the need for a **stoma**, which is a temporary or permanent artificial opening in the abdominal wall. The opening may be either an **ileostomy**, a surgical opening in the ileum, or a **colostomy**, a surgical opening in the colon. The ends of the intestine are brought through the abdominal wall to create the stoma (RNAO, 2009).

The standard bowel diversion creates a stoma, or the patient can undergo reconstructive surgery that uses the

native sphincter for bowel continence. The reconstructive surgery includes either a continent stoma procedure, which is now rarely done, or the ileoanal pouch anastomosis, which is described later (Canadian Association for Enterostomal Therapy [CAET], 2008b).

Ostomies. The location of the ostomy determines the consistency of the stool. An ileostomy bypasses the entire large intestine. As a result, stools are frequent and liquid. The same is true for a colostomy of the ascending colon (Figure 44-13). A colostomy of the transverse colon, in general, results in a more solid, formed stool (see Figure 44-13). The descending colostomy and sigmoid colostomy emit a near-normal stool (see Figure 44-13). The location of a colostomy is determined by the patient's medical problem and general condition. Colostomies have three types of construction: loop colostomy, end colostomy, and double-barrel colostomy.

Loop Colostomy. A loop colostomy is usually performed in a medical emergency when closure of the colostomy is anticipated. Loop colostomies are usually temporary large stomas constructed in the transverse colon. The surgeon pulls a loop

► BOX 44-10 Procedural Guideline

Digital Removal of Stool

Delegation Considerations:

The digital removal of stool procedure should not be delegated to unregulated care providers (UCPs).

Equipment:

- Bath blanket
- Waterproof pad
- Clean gloves
- Lubricant
- Towel
- Washcloth
- Soap and water
- Bedpan

Procedure:

1. Check the patient record for a physician's order to manual disimpaction.
2. Explain the procedure to the patient.
3. Perform hand hygiene. Take baseline vital signs prior to the procedure. Help the patient to lie on the left side with knees flexed and back toward you.
4. Drape the trunk and lower extremities with a bath blanket and place a waterproof pad under the buttocks. Keep a bedpan next to the patient.
5. Apply disposable gloves and lubricate the index finger of your dominant hand with lubricating jelly.
6. Gently insert the gloved index finger into the rectum and advance the finger slowly along the rectal wall toward the umbilicus.
7. Gently loosen the fecal mass by massaging around it. Work the finger into the hardened mass.
8. Work the feces downward toward the end of the rectum. Remove small pieces at a time and discard into the bedpan.
9. Reassess the patient's vital signs and look for signs of fatigue. Stop the procedure if the heart rate drops significantly or if the heart rhythm changes. Monitor for one hour postprocedure.
10. Continue to remove feces and allow the patient to rest at intervals.
11. After completion, wash and dry the buttocks and anal area.
12. Remove the bedpan and dispose of the feces. Remove gloves by turning them inside out, and then discard.
13. Assist the patient to the toilet or position the patient on a clean bedpan if the urge to defecate develops.
14. Perform hand hygiene. Record results of the removal of the impaction by describing the fecal characteristics.
15. Follow the procedure with enemas or cathartics as ordered by physician.
16. Reassess the patient's vital signs and level of comfort.

of bowel onto the abdomen. The loop ostomy has two openings through the one stoma (see Figure 44-13). The proximal end drains stool, whereas the distal portion drains mucus (Monahan et al., 2007).

End Colostomy. The end colostomy consists of one stoma formed from one end of the bowel with the distal portion of the GI tract either removed or sewn closed (known as Hartmann's pouch) and left in the abdominal cavity. For many patients, end colostomies are a result of surgical treatment for colorectal cancer. In such cases, the rectum might also be

► TABLE 44-6 Purposes of Nasogastric Intubation

Purpose	Description	Type of Tube
Decompression	Removal of secretions and gaseous substances from the gastrointestinal tract to prevent or relieve abdominal distension	Salem sump, Levin, Miller-Abbott
Feeding (i.e., gavage; see Chapter 42)	Instillation of liquid nutritional supplements or feedings into the stomach for patients unable to swallow fluid	Duo, Dobhoff, Levin
Compression	Internal application of pressure by means of an inflated balloon to prevent internal esophageal or gastrointestinal hemorrhage	Sengstaken-Blakemore
Lavage	Irrigation of the stomach in cases of active bleeding, poisoning, or gastric dilation	Levin, Ewald, Salem sump

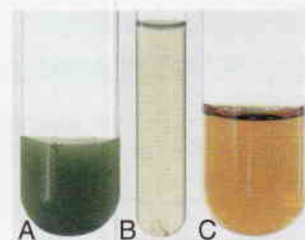


Figure 44-12 Gastric contents. **A**, Stomach. **B**, Stomach. **C**, Intestinal.

Source: Courtesy Dr. Norma Metheny, St Louis University, School of Nursing, St Louis, MO.

removed. Patients with diverticulitis who are treated surgically often have a temporary end colostomy with a Hartmann's pouch (Figure 44-14).

Double-Barrel Colostomy. In a double-barrel colostomy (as opposed to the loop colostomy), the bowel is surgically severed and the two ends are brought out onto the abdomen (see Figure 44-13). The double-barrel colostomy consists of two distinct stomas: the proximal functioning stoma and the distal nonfunctioning stoma.

Kock Continent Ileostomy. The Kock continent ileostomy is created using the patient's small intestine to create a pouch. This procedure is occasionally used in the treatment of ulcerative colitis. The pouch has a continent stoma, which is a nipple-type valve that is drained with an external catheter. The patient places the external catheter intermittently in the stoma and empties the pouch several times a day. The stoma is covered with a protective dressing or a stoma cap (RNAO, 2009).

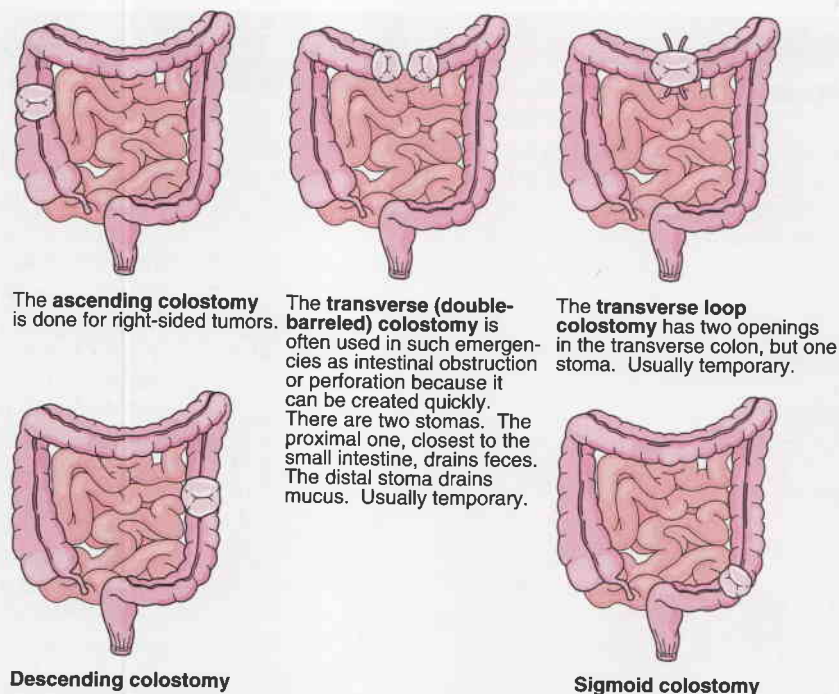


Figure 44-13 Different types of colostomies. **Source:** Monahan, F. D., Neighbors, M., Sands, J. K., Marek, J. F., Green, C. J. (2007). *Phipps' medical-surgical nursing: Health and illness perspectives* (8th ed., p. 1262, Fig. 43-10). St Louis, MO: Mosby Elsevier.

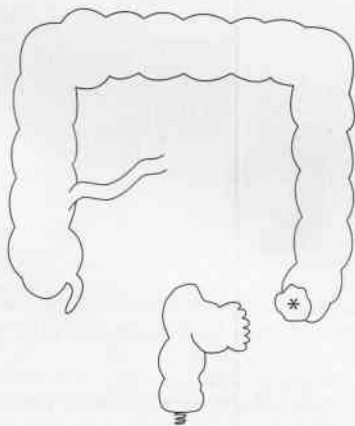


Figure 44-14 Hartmann's pouch procedure. **Source:** Redrawn from Registered Nurses' Association of Ontario (2009). *Ostomy care and management* (p. 67). Toronto: Registered Nurses' Association of Ontario. Retrieved from http://www.rnao.org/Storage/59/5393_Ostomy_Care_Management.pdf. Illustration by Nancy Bauer, HBA, HB Admin, RN, ETN. Published with permission.

however, a well-placed stoma should not interfere with the patient's activities and can be concealed by clothing (Banks & Razor, 2003). Although clothing may conceal the ostomy, the patient feels different. Many patients have difficulty maintaining or initiating normal sexual relations. An important factor in the patient's reactions is the character of the fecal secretions and the ability to control them. The patient's self-esteem can be impaired by foul odours, spillage, or leakage of liquid stools and the inability to regulate bowel movements.

Care of Ostomies. Patients with temporary or permanent bowel diversions have unique bowel elimination needs. Individuals with an ostomy wear a pouch or appliance to collect the **effluent** (the stool discharged from an ostomy) from the stomas (RNAO, 2009). These patients must use meticulous skin care to prevent liquid stool from irritating the skin around the stoma (Figure 44-15).

Irrigating a Colostomy. Although this practice is not as common as it once was, some patients may be instructed to irrigate their left-sided colostomies in order to regulate colon emptying. Other patients do not want to spend the additional 60 to 90 minutes in the bathroom every day, and they empty their pouch only as necessary (CAET, 2008a).

Specific equipment for irrigating a colostomy should be used. An enema set should never be used to irrigate a colostomy. A special cone-tipped irrigator (Figure 44-16) is used. This device prevents both bowel penetration and backflow of the irrigating solution. Patients usually sit on the toilet and place an irrigating sleeve over the stoma. The end of this sleeve extends into the bowl of the toilet. The physician orders the amount and type of solution. For adults, the amount ranges from 500 to 700 mL of tap water. The solution is instilled slowly through the lubricated cone tip. Irrigation should take 5 to 10 minutes. The patient then removes the cone tip and waits 30

Psychological Considerations. A stoma can cause serious body-image changes, particularly when it is permanent. A classic study reported by Walsh et al. (1995) measured the perception of body image in patients who had a stoma. Patients who had a longstanding history of chronic bowel disease, such as Crohn's disease or ulcerative colitis, reported an improved quality of life but a lower body image. Conversely, patients who needed an ostomy because of cancer reported a higher body image but a reduced quality of life. Patients often perceive a stoma as invasive and disfiguring;

Appendix E: Sample Ostomy Teaching Record

OSTOMY TEACHING RECORD

Client: _____

Address: _____

Before Surgery: Teaching Completed	Date & Initial
Date of surgery	
Type of surgery/ostomy	
Reason for surgery	
E.T. Nurse visit	
Stoma site selection and marking	
Stoma location and appearance	
Given teaching booklets about surgery	
Given samples of pouching system	
Purpose of pouch and skin barrier	
Knowledge of others with an ostomy	
Viewed ostomy video	

After Surgery: While in Hospital Teaching Completed	Date & Initial
Stoma (size, swelling, shrinkage and appearance)	
Type of drainage while in hospital	
Observe/assist with pouch emptying	
Independent with pouch emptying	
Observe/assist with release of gas from pouch	
Independent with release of gas from pouch	
Observe/assist with pouch and skin barrier change	
Discuss odour control options	
Signs of pouch leakage (prevention and treatment)	
Viewed ostomy video and given teaching booklet (if not done pre-op)	
Who to call if problems occur after discharge from hospital	

After Surgery: Discharged Home Teaching Completed	Date & Initial
Type of drainage at home	
Stoma (size, swelling, shrinkage and appearance)	
Independent with pouch emptying	
Observe/assist with pouch and skin barrier change	
Independent with pouch and skin barrier change	
Signs of pouch leakage (prevention and treatment)	
Skin breakdown (prevention and treatment)	
Application instructions	
Supply list/where to buy	
Care of supplies/emergency kit	
Discuss odour control options	
Nutrition/dietary instructions	
Bathing	
Activity/travel	
Clothing modifications	
Sexual function concerns	
Financial Assistance (A.D.P., Private Insurance, Social Assistance, Disability)	
United Ostomy Association of Canada Support Group	
Ostomy visitor	
Discharge instructions	

Colostomy: Teaching Completed	Date & Initial
Care of perineal wound (if present)	
Mucous drainage per rectum (if rectum left in place)	
Care of a mucous fistula (if present)	
Colostomy irrigation information	
Trial of a colostomy irrigation (optional)	
Constipation/diarrhea/gas	

Ileostomy: Teaching Completed	Date & Initial
Care of perineal wound (if present)	
Mucous drainage per rectum (if rectum left in place)	
Sodium loss and replacement	
Potassium loss and replacement	
Obstruction and management	
Fluid imbalance and treatment	
Medication	

Figure 44-15 Sample ostomy teaching record. **Source:** Registered Nurses' Association of Ontario. (2009). *Ostomy care and management* (pp. 77-78). Toronto: RNAO. Retrieved from http://www.rnao.org/Storage/59/5393_Ostomy_Care_Management.pdf.

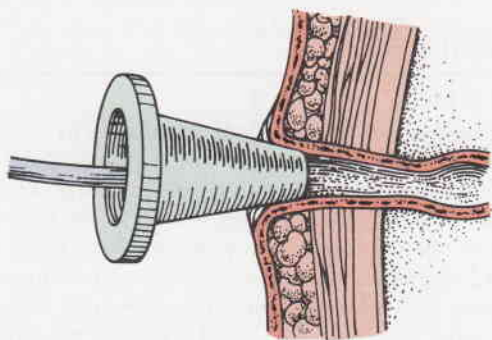


Figure 44-16 Ostomy irrigation cone inserted into the stoma.

to 45 minutes for the solution and feces to drain out of the irrigation sleeve. Once the drainage stops, the patient applies a stoma cap or a pouch. If a patient chooses to irrigate the colostomy, the timing of the irrigation can be individualized to the patient's lifestyle.

Pouching Ostomies. Ostomies require a pouch to collect fecal material. An effective pouching system protects the skin, contains fecal material, remains odour-free, and is comfortable

and inconspicuous. A person wearing a pouch should feel secure in participating in any activity.

Many pouching systems are available. To ensure that a pouch fits well and meets the patient's needs, consider the location of the ostomy; the type and size of the stoma; the amount and consistency of the effluent; the size and contour of the abdomen; the condition of the skin around the stoma; skin sensitivities or allergies; the physical activities of the patient; cognitive abilities for learning; the patient's personal preference, age, and dexterity; and the cost of the equipment. An **enterostomal therapist (ET)** is a nurse trained to care for wound and ostomy management. The staff nurse collaborates with the ET to ensure the correct pouching system is used. For example, a referral to an ET nurse would be appropriate to plan the care of a patient who has a high-output ostomy that requires a pouch modification.

A pouching system consists of a pouch and a skin barrier (Figure 44-17). Pouches come in one- and two-piece systems that are disposable or reusable. Some pouches have the opening precut by the manufacturer; others require the stoma opening to be custom cut to the patient's specific stoma size.

Skin barriers include wafers, pastes, powders, and liquid film that are applied to the skin around the stoma. Wafer skin barriers, which are permanently attached to the ostomy pouch,

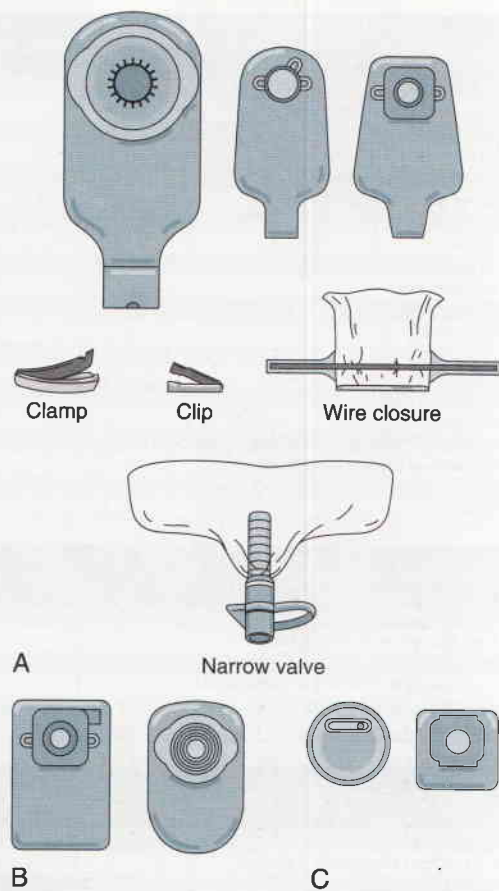


Figure 44-17 Common ostomy pouch products, closures, and patches. **A**, Drainable pouches and pouch closures. **B**, Non-drainable pouches. **C**, Patches for regulated colostomies. **Source:** Monahan, F. D., Neighbors, M., Sands, J. K., Marek, J. F., & Green, C. J. (2007). *Phipps' medical-surgical nursing: Health and illness perspectives* (8th ed., p. 1264, Fig. 43-11). St Louis, MO: Mosby Elsevier.

are called one-piece pouch systems. In a two-piece system, the pouch can be detached from the skin barrier for emptying or changing. This system allows the skin barrier to remain around the patient's stoma for several days, thus minimizing the chance of skin damage from too-frequent removal of the skin barrier from the peristomal skin (Figure 44-18). When using a two-piece pouching system, the skin barrier and pouch must be the same corresponding size and from the same manufacturer. The pouch from one manufacturer will not fit correctly on the skin barrier from another manufacturer. Ensure the patient understands to use an ostomy pouch made for collecting fecal matter (i.e., a pouch specifically for a colostomy or ileostomy) and not a pouch for collecting urine.

Instruct patients to measure the stoma size carefully when selecting and cutting out the opening on the wafer skin barrier. A good skin barrier protects the skin, prevents irritation from repeated removal of the pouch, and is comfortable for the patient to wear. Skill 44-2 describes the steps for applying one type of pouch system.

Nutritional Considerations for Patients with Ostomies. Nutritional therapy is important for patients with ostomies. During the first weeks after surgery, many physicians recommend low-fibre diets, particularly for ileostomy patients,

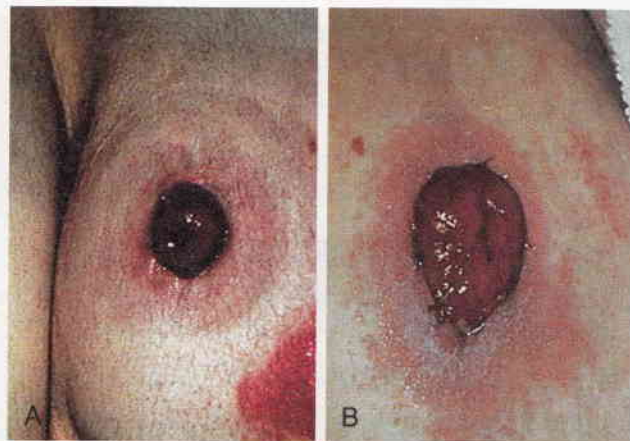


Figure 44-18 **A**, Mechanical injury to the peristomal skin. **B**, Candidiasis damage to the peristomal skin. **Source:** Permission to use these copyrighted photos has been granted by the owner, Hollister Incorporated.

because the small bowel requires time to adapt to the diversion. Low-fibre foods include bread, noodles, rice, cream cheese, eggs (not fried), strained fruit juices, lean meats, fish, and poultry. As ostomies heal, patients can eat almost any food. High-fibre foods, such as fresh fruits and vegetables, help to ensure a more solid stool, which is needed to achieve success at irrigation. Blockage must be avoided. The stoma's surgical construction can affect the likelihood of blockage.

Patients with an ileostomy should eat slowly and chew their food completely. Drinking 10 to 12 glasses of water daily also helps to prevent blockage. High-fibre foods that may cause problems include stringy meats; mushrooms; popcorn; some fruits, such as cherries; and some seafood, such as shrimp and crab. Ostomy patients may benefit from avoiding foods that cause gas and odour, such as broccoli, cauliflower, dried beans, and Brussels sprouts.

❖Evaluation

Patient Care

The effectiveness of care depends on success in meeting the goals and expected outcomes of care. Optimally, the patient will be able to have regular, pain-free defecation of soft, formed stools. The patient is the only person who is able to determine whether the bowel elimination problems have been relieved and which therapies were the most effective (Figure 44-19). The patient will also be able to demonstrate information learned regarding establishment of a normal bowel elimination pattern. The patient will be able to demonstrate any skills learned, such as ostomy protocols and skin protection. The patient will be able to accomplish normal defecation by manipulating components of daily living, such as diet, fluid intake, and exercise. The patient will have minimal reliance on artificial means of defecation, such as enemas and laxative use.

Patient Expectations

If you have been successful in establishing a therapeutic relationship with the patient, the patient will feel more comfortable in discussing the intimate details often associated with bowel elimination. The patient will also not be as fearful of

► SKILL 44-2 Pouching an Ostomy



Delegation Considerations

The skill of pouching a newly established ostomy should not be delegated to unregulated care providers (UCPs). Pouching of a well-established ostomy can be delegated to a UCP. You must do the following:

- Assist the caregiver in selecting the appropriate pouch and skin barrier.
- Inform the caregiver of the signs of stomal and peristomal skin changes that should be reported to a nurse.
- Ask the caregiver to monitor and report the characteristics and volume of the ostomy output and report changes in volume or consistency to you for further assessment.

Equipment

- Clear drainable colostomy (or ileostomy) pouch in the correct size for a two-piece system or custom cut to fit a one-piece system with an attached skin barrier
- Pouch closure device, such as a clamp or clip if needed
- Clean gloves
- Gauze pads and washcloths
- Towel or disposable waterproof barrier
- Basin with warm tap water
- Scissors and pen
- Adhesive remover (optional)

Procedure

STEPS

1. Perform hand hygiene.
2. Apply gloves. Observe the skin barrier and pouch for leakage and the length of time in place. Depending on the type of pouching system used (e.g., an opaque pouch), you may need to remove the pouch to fully observe the stoma. Clear pouches permit the viewing of the stoma without their removal.

RATIONALE

- Leakage may indicate the need for a different type of pouch or sealant.

Critical Decision Point: Intact skin barriers with no evidence of leakage do not need to be changed daily and can remain in place for three to five days (depending on manufacturer's guidelines).

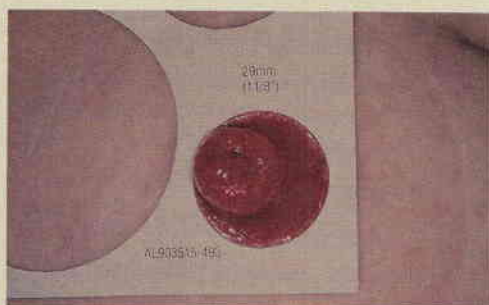
3. Observe the stoma for colour, swelling, trauma, and healing; the stoma should be moist and reddish-pink. Assess the type of stoma. Stomas can be flush with the skin or can be a bud-like protrusion on the abdomen.
4. Measure the stoma at each pouching change. Follow the pouch manufacturer's directions and measuring guide to determine which pouch to use on the basis of the patient's stoma size. The opening around the appliance should be no greater than 2 mm larger than the stoma (Perry & Potter, 2010).
5. Observe the abdominal incision (if present).
6. Observe the effluent from the stoma and record the intake and output. Empty the pouch if it is more than one-third to one-half full. Ask the patient about skin tenderness. Remove gloves and perform hand hygiene.
7. Assess the abdomen for the best type of pouching system to use. Consider the following:
 - A. Contour and peristomal plane
 - B. Presence of scars, incisions
 - C. Location and type of stoma
8. Assess the patient's self-care ability to determine the best type of pouching system to use.
9. After removing the skin barrier and pouch, assess the skin around the stoma, noting scars, folds, skin breakdown, and the peristomal suture line, if present. Keep the pouch loosely attached to the stoma to collect any drainage while the system is being changed.

- Stoma characteristics are one factor to consider when selecting an appropriate pouching system.
- The size of the stoma determines the correct size of equipment, which prevents trauma to the stoma. Too large an opening can permit fecal drainage to ooze from under the appliance, causing skin irritation. Too small an opening can cause the appliance to cut into the stoma (Perry & Potter, 2010).
- The relationship of the abdominal incision to the stoma determines proper placement of the pouch.
- Effluent from the stoma is caustic. If effluent comes in contact with the sensitive peristomal skin, the risk of skin breakdown increases. Pouches must be emptied because the weight of the pouch may disrupt the seal of adhesive on the skin (Perry & Potter, 2010).
- The characteristics of the abdomen determine the pouching system selection and the need for additional equipment. For a stoma to have an adequate seal with an ostomy appliance, the stoma must be placed within the abdominal rectus muscle, away from abdominal creases and folds, away from the bony understructures, and surrounded by at least 5 cm of smooth surface on all sides (Perry & Potter, 2010).
- Patients who have difficulty using their hands or who have limited vision may find a one-piece system or a precut pouch and skin barrier more desirable to use; others prefer being able to keep the skin barrier in place for several days, changing just the pouch, and therefore prefer the two-piece system.
- Assessing the skin around the stoma determines the need for barrier paste to increase adherence of the pouch to the skin or to fill in irregularities.

Critical Decision Point: If the skin around the stoma is discoloured, weeping, itchy, or sore, refer the patient to an ostomy specialist (Perry & Potter, 2010).

► SKILL 44-2 Pouching an Ostomy—cont'd

10. Determine the patient's emotional response, knowledge, and understanding of an ostomy and its care.
 11. Explain the procedure to the patient; encourage the patient's interaction and questions.
 12. Perform hand hygiene. Assemble the equipment and close the room curtains or door.
 13. Position the patient either standing or in a semi-reclining position and draped. If seated, position the patient either on or in front of the toilet.
 14. Perform hand hygiene and apply disposable gloves.
 15. Place the towel or disposable waterproof barrier under the patient.
 16. Completely remove the used pouch and skin barrier by gently pushing the skin away from the barrier. An adhesive remover may be used to facilitate removal of the skin barrier.
 17. Clean the peristomal skin gently with warm tap water using gauze pads or a clean washcloth; do not scrub the skin; dry completely by patting the skin with gauze or towel.
 18. Measure the stoma for the correct size of pouching system needed, using the manufacturer's measuring guide (see Step 18 illustration).
 19. Select the appropriate pouch for the patient on the basis of your patient assessment. For a custom cut-to-fit pouch, use an ostomy guide to cut an opening on the pouch 2 mm larger than the stoma before removing the backing (Perry & Potter, 2010). Prepare the pouch by removing the backing from the barrier and adhesive (see Step 19 illustration). For an ileostomy, apply a thin circle of barrier paste around the opening in the pouch; allow to dry.
- Understanding the patient's perspective assists in determining both the extent to which the patient is able to participate in care and the patient's need for teaching and the clarification of information.
 - Explaining the procedure reduces the patient's anxiety and promotes the patient's participation.
 - Proper hand hygiene reduces the transmission of infection. Organizing the equipment optimizes the use of time and conserves the patient's and nurse's energy. Privacy reduces the embarrassment for the patient.
 - When the patient is semi-reclined, fewer wrinkles ease the application of the pouching system; draping maintains the patient's dignity.
 - Proper hand hygiene reduces the transmission of microorganisms.
 - The towel or waterproof barrier protects the bed linen.
 - Working gently reduces trauma; jerking irritates the skin and can cause tears.
 - Avoid the use of soap because it leaves a residue on the skin that interferes with pouch adhesion to the skin. Skin must be as dry as the skin barrier; the pouch does not adhere to wet skin. If blood appears on the gauze pad, do not be alarmed; the stoma, if rubbed, may ooze some blood from the cleaning process. The stoma's surface is a highly vascular mucous membrane. Bleeding into the pouch is abnormal.
 - Measuring the stoma ensures accuracy in determining the correct pouch size needed. The stoma shrinks and does not reach its usual size for six to eight weeks.
 - The barrier paste facilitates the seal and protects the skin. The size of the pouch opening keeps drainage off the skin and reduces the risk of damage to the stoma during peristalsis or physical activity. The pouch and skin barrier are changed whenever leaking occurs. They can also be changed before or after a tub bath or shower. The stool is alkaline, which is an irritant on the skin; fecal bacteria can colonize on the skin and increase the risk of infection. Change the pouch and skin barrier when the patient is comfortable; before a meal is better because this timing avoids increased peristalsis and the chance of evacuation during the pouch change.



Step 18 Measuring a stoma.



Step 19 Preparing an ostomy pouch.

► SKILL 44-2 Pouching an Ostomy—cont'd



Critical Decision Point: If patient has a large volume of liquid stool from an ileostomy, consider using a high-output pouch that will contain the volume of effluent and reduce the frequency of pouch emptying.

20. Apply the skin barrier and pouch. If creases occur next to the stoma, use a barrier paste to fill in; let dry one to two minutes.

Critical Decision Point: If the patient has a surgical incision near the stoma, the skin barrier may need to be trimmed to fit.

A. For a one-piece pouching system:

- (1) Use skin sealant wipes on the skin directly under the adhesive skin barrier or pouch; allow to dry. Press the adhesive backing of the pouch or skin barrier smoothly against the skin, starting from the bottom and working up and around the sides.
- (2) Hold the pouch by the barrier, centre it over the stoma, and press down gently on the barrier; the bottom of the pouch should point toward the patient's knees (see Step 20A[2] illustration).
- (3) Maintain gentle finger pressure around the barrier for one to two minutes.

B. For a two-piece pouching system:

- (1) Apply the flange (the barrier with adhesive) as in steps above for a one-piece system (see Step 20B[1] illustration). Then snap on the pouch and maintain finger pressure.

- The flange creates a wrinkle-free, secure seal and decreases irritation from the adhesive on skin.



Step 20A(2) Applying a one-piece pouch. **Source:** Courtesy ConvaTec, Princeton, NJ.

C. For both pouching systems, gently tug on the pouch in a downward direction.

21. Apply a nonallergenic paper tape around the pectin skin barrier in a "picture frame" method. Half of the tape should be on the skin barrier and half on the patient's skin. Some patients prefer a belt attached to the pouch for extra security in place of the tape.

Critical Decision Point: If the patient chooses to wear a belt, ensure it is not fastened too tightly by placing two fingers between the belt and the patient's skin.

22. Fold the bottom of drainable open-ended pouches up once and close using a closure device such as a clamp (or follow the manufacturer's instructions for closure).
23. Properly dispose of the old pouch and the soiled equipment.
24. Remove gloves and perform hand hygiene.
25. Change a one- or two-piece pouch every three to seven days unless it is leaking; a pouch can remain in place for tub bath or shower; after a bath or shower, pat the adhesive dry.

- Proper closure maintains a secure seal to prevent leaking.

- Proper hand hygiene reduces the transmission of microorganisms.
- Avoid unnecessary trauma to the skin from too frequent changes. Drying the adhesive ensures the adhesion of the pouch.



Step 20B(1) Application of a barrier-paste flange. **Source:** Courtesy ConvaTec, Princeton, NJ.

- Tugging on the pouch determines whether the pouch is securely attached.
- "Picture framing" the pectin skin barrier adds to the security of keeping the pouch system attached securely.

► SKILL 44-2 Pouching an Ostomy—cont'd



26. Ask whether the patient feels discomfort around the stoma.
 27. While the pouch is removed and the skin is being cleaned, note the appearance of the stoma around the skin and the existing incision (if present). Re-inspect the condition of the skin barrier and adhesive.
 28. Observe the patient's nonverbal behaviours as the pouch is applied. Ask whether the patient has any questions about the pouching.
- The patient's perception of discomfort determines the presence of skin irritation.
 - Assessing the skin and existing incision determines the condition of the tissues and the progress of healing. The condition of the skin barrier and adhesive can detect the presence of leaks.
 - Nonverbal behaviours indicate the patient's emotional response to the stoma and the readiness for learning. The patient's questions determine the level of understanding of the procedure.

Unexpected Outcomes

Damage of the peristomal skin

Necrosis of stoma (purple or black discolouration, dryness, failure to bleed, or sloughing of tissue)

Related Interventions

- Assess for the following conditions and report their occurrence to the physician for treatment:
 - Mechanical damage (see Figure 44-18, A) due to inappropriate skin care or incorrect tape removal)
 - Chemical damage due to the effluent coming into contact with the peristomal skin or a skin reaction to the adhesive
 - Damage due to a fungus (e.g., candidiasis; see Figure 44-18, B), usually caused by excessive skin moisture
- Assess the circulation to the stoma.
- Observe for excessive edema or tension on the bowel suture line (if present).
- Immediately report this finding to the physician.

Recording and Reporting

- Chart the type of pouch and skin barrier applied.
- Record the amount, appearance, and texture of the stool; the condition of the peristomal skin; and the condition of any sutures.
- Report any of the following to the charge nurse or the physician, or both:
 - Any abnormal appearance of the stoma, the suture line, the peristomal skin, the character of output, or the absence of bowel sounds.
 - No flatus in 24 to 36 hours and no stool by the third day.
 - Document abdominal distension, excessive tenderness, and the nature of bowel sounds.
- Record the patient's level of participation and need for instruction.

Home Care Considerations

- Evaluate the patient's home toileting facilities. Note the presence of adequate toileting facilities.
- Caution the patient that most ostomy pouches and barriers cannot be flushed down the toilet; they clog the plumbing system. Dispose of used ostomy pouch according to agency policy and local sanitation regulations.

embarrassment as you assist the patient with his or her bowel elimination needs. The patient will relate a feeling of comfort and freedom from pain as bowel elimination needs are met within the limits of the patient's condition and treatment.

❖ KEY CONCEPTS

- The mechanical breakdown of food elements, gastrointestinal motility, and selective absorption and secretion of substances by the large intestine influence the character of feces.
- Food high in fibre content and an increased fluid intake keep feces soft.
- Ongoing use of cathartics, laxatives, and enemas affects and delays the reflexes of normal defecation.
- Vagal stimulation, which slows the heart rate, may occur during straining while defecating, receiving enemas, and during digital removal of an impacted stool.
- The greatest danger from diarrhea is developing an imbalance of fluids and electrolytes.
- The location of an ostomy influences the consistency of the stool.
- Assessment of bowel elimination patterns should focus on bowel habits, factors that normally influence defecation, recent changes in bowel elimination, and a physical examination.
- Indirect and direct visualization of the lower gastrointestinal tract requires cleansing of the bowel before the procedure.
- When selecting a diet to promote normal bowel elimination, consider the frequency of defecation, the fecal characteristics, and the effect of foods on the gastrointestinal function.
- Proper positioning on a bedpan allows the patient to assume a position similar to squatting without experiencing muscle strain.
- Nasogastric intubation decompresses the gastric contents by removing secretions and gaseous products from the gastrointestinal tract.
- The purposes of gastric decompression are to keep the gastrointestinal tract free of secretions, to reduce nausea and gas, and to decrease the risk of vomiting and aspiration.
- Proper selection and use of an ostomy pouching system are necessary to prevent damage to the skin around the stoma.
- Dangers during digital removal of stool include traumatizing the rectal mucosa and promoting vagal stimulation.
- Skin breakdown can occur after repeated exposure to liquid stool.

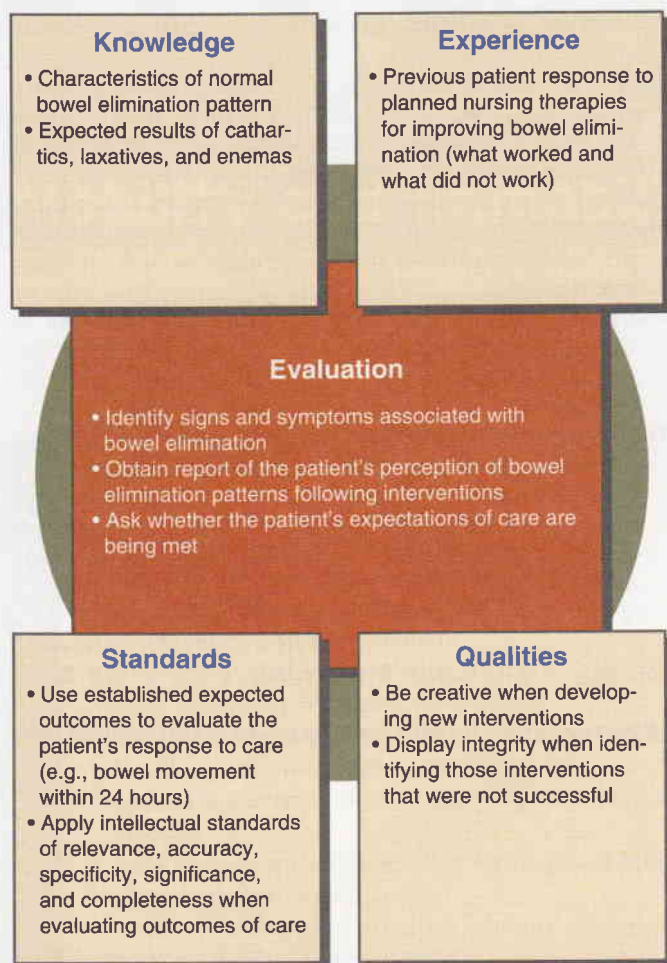


Figure 44-19 Critical thinking model for bowel elimination evaluation.

✦ CRITICAL THINKING EXERCISES

1. A 19-year-old man with a history of good health and regular exercise is your patient at the university health service facility where you work. He complains of increasing diarrhea and abdominal cramping; he has no weight loss. He states that on rare occasions he noticed blood on the toilet paper he used. What additional pieces of assessment data do you need?
2. A long-term care facility has invited you to present a talk on preventing bowel incontinence in their residents. What points of information do you include in your presentation?
3. A 22-year-old man is to undergo surgery for Crohn's disease. He will have a new pouching ileostomy. He and his mother need to learn what the ileostomy means for his future bowel elimination needs. What do you tell them?
4. Mrs. Edna Pidpahora is 82 years old and a resident in a long-term care facility. In the Emergency Department, she was just assessed for acute confusion and has been admitted to your ward. In her documentation, you see that she has become more confused and forgetful since she moved into long-term care four months ago. She spends most of her time in bed or sitting in a chair in her room. She is occasionally incontinent of urine and has not had a bowel movement in five days. She is taking the following medications and supplements:

levothyroxine (Synthroid), calcium carbonate, vitamin D, chlorothiazide, risperidone, chloral hydrate. What steps would you take to understand and address her apparent constipation (Neil et al., 2003; Robson et al., 2000; Spina & Scordo, 2002)?

✦ REVIEW QUESTIONS

1. Most nutrients and electrolytes are absorbed in which of the following areas?
 1. Colon
 2. Stomach
 3. Esophagus
 4. Small intestine
2. During the nursing assessment, the patient reveals that he has diarrhea and cramping every time he eats ice cream. He attributes this reaction to the cold nature of the food. These symptoms might be associated with which of the following?
 1. Food allergy
 2. Irritable bowel syndrome
 3. Lactose intolerance
 4. Increased peristalsis
3. You are assessing a 55-year-old patient who is in the clinic for a routine physical examination. Under which of the following scenarios would you instruct the patient to obtain fecal occult blood testing (FOBT)?
 1. The patient has a family history of polyps.
 2. The patient reports rectal bleeding.
 3. A palpable mass is detected on digital examination.
 4. The patient is due for a routine examination for colon cancer.
4. Which of the following agents decreases colonic propulsive contractions while increasing the mixing of contractions?
 1. Antidiarrheal opiate agents
 2. Hypertonics
 3. Cathartics
 4. Laxatives
5. Which of the following situations results in diarrhea that occurs with a fecal impaction?
 1. A clear liquid diet
 2. Irritation of the intestinal mucosa
 3. Seepage of stool around the impaction
 4. Inability of the patient to form a stool
6. A cleaning enema is ordered for a 55-year-old patient before intestinal surgery. What amount of solution should be instilled?
 1. 150 to 200 mL
 2. 200 to 400 mL
 3. 400 to 750 mL
 4. 750 to 1000 mL
7. During the enema, the patient complains of pain. You note rectal bleeding and blood in the return fluid. What action do you take?
 1. Stop the instillation.
 2. Slow the rate of instillation.
 3. Stop the instillation, notify the physician, and obtain vital signs.
 4. Tell the patient to breathe slowly and relax.

8. What is one of the greatest problems in caring for a patient with a nasogastric tube?
 1. Dehydration
 2. Maintaining comfort
 3. Constipation
 4. Nutritional therapy
9. What term is given to the stool discharged from an ostomy?
 1. Effluent
 2. Cathartics
 3. Colonic fluid
 4. Mucosa
10. What term describes a nurse trained to care for ostomy patients?
 1. Enterostomal therapist
 2. Nurse practitioner
 3. Ostomy practitioner
 4. GI therapist

❖ RECOMMENDED WEB SITES

Canadian Cancer Society: <http://www.cancer.ca>

This Web site is a source for general information about all types of cancers, including Canadian statistics of the prevalence, mortality, and survival rates for specific cancers.

Canadian Digestive Health Foundation: <http://www.cdhf.ca/>

The Canadian Digestive Health Foundation (CDHF) supports research and education in the management and cure of digestive diseases and disorders.

Colorectal Cancer Association of Canada: <http://www.colorectal-cancer.ca>

Colorectal cancer is the second most common cause of cancer deaths in Canada. The Colorectal Cancer Association of Canada is a nonprofit organization that supports individuals with colorectal cancer, their families, and caregivers.

Canadian Nurse Continence Advisor Association: www.cnca.ca

This Web site has both professional and patient resources on promoting education and research about urinary and fecal incontinence.

Registered Nurses' Association of Ontario, Prevention of Constipation in the Older Adult Population: <http://rnao.ca/bpg/guidelines/prevention-constipation-older-adult-population>

This document is a Registered Nurses' of Ontario (RNAO) Best Practice Guideline and offers a professional nursing standard for reducing the frequency and severity of constipation among older adults. The guideline is relevant to all areas of clinical practice, including acute care, community care, and long-term care.

Review Question Answers

1. 4, 2, 3, 3, 4, 4, 1, 5, 3, 6, 4, 7, 3, 8, 2, 9, 1, 10, 1

Rationales for the Review Questions appear at the end of the book.

Mobility and Immobility

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Based on the original chapter by Ann B. Tritak, BSN, MA, RN, EdD

objectives

Mastery of content in this chapter will enable you to:

- Define the key terms listed.
- Describe the functions of the musculoskeletal (skeleton, skeletal muscles) and nervous systems in the regulation of movement.
- Discuss physiological and pathological influences on body alignment and joint mobility.
- Identify changes in physiological and psychosocial function associated with immobility.
- Assess for correct and impaired body alignment and mobility.
- State correct nursing diagnoses for impaired body alignment and mobility.
- Develop nursing care plans for patients with impaired body alignment and mobility.
- Describe essential techniques when assisting with active and passive range-of-motion (ROM) exercises, assisting a patient to move up in bed, repositioning a patient, assisting a patient to a sitting position, and transferring a patient from a bed to a chair or from a bed to a stretcher.
- Evaluate the nursing care plan for maintaining body alignment and mobility.

media resources

evolve WEBSITE

<http://evolve.elsevier.com/Canada/Potter/fundamentals/>

- Audio Chapter Summaries
- Examination Review Questions
- Glossary
- Skills Performance Checklists
- Student Learning Activities
- Video Clips
- Weblinks

key terms

- | | |
|--------------------------------------|--|
| Activity tolerance, p. 1209 | Instrumental activities of daily living (IADLs), p. 1231 |
| Anthropometric measurements, p. 1210 | Joint contracture, p. 1200 |
| Atelectasis, p. 1199 | Joints, p. 1196 |
| Bariatric, p. 1230 | Ligaments, p. 1196 |
| Bed rest, p. 1198 | Logroll, p. 1228 |
| Body alignment, p. 1196 | Mobility, p. 1198 |
| Body mechanics, p. 1196 | Muscle atrophy, p. 1198 |
| Chest physiotherapy (CPT), p. 1217 | Negative nitrogen balance, p. 1198 |
| Crutch gait, p. 1244 | Orthostatic hypotension, p. 1199 |
| Deconditioning, p. 1196 | Osteoporosis, p. 1200 |
| Disuse osteoporosis, p. 1200 | Paraplegia, p. 1198 |
| Embolus, p. 1199 | Pathological fractures, p. 1198 |
| Exercise, p. 1209 | Posture, p. 1196 |
| Fracture, p. 1198 | Pressure ulcer, p. 1201 |
| Footdrop, p. 1200 | Quadriplegia, p. 1198 |
| Friction, p. 1196 | Tendons, p. 1196 |
| Gait, p. 1209 | Thrombus, p. 1199 |
| Gait belt, p. 1230 | Transfer belt, p. 1230 |
| Hemiparesis, p. 1197 | Trapeze bar, p. 1222 |
| Hemiplegia, p. 1197 | Trochanter roll, p. 1221 |
| Hypostatic pneumonia, p. 1199 | Urinary stasis, p. 1201 |
| Immobility, p. 1198 | |

Mobility refers to the ability to move easily and independently. To maintain optimal physical mobility, the musculoskeletal and nervous systems of the body must be intact and functioning. Illnesses, surgery, injuries, pain, and aging can temporarily or permanently impair mobility. Nurses need to know the many hazards created by immobility and how to prevent them. Nurses also need to know how to care for patients who are immobile. This care includes positioning the patient who is immobile so that optimal body alignment is attained, and moving and transferring patients when they cannot do so independently. Clinical nursing practice related to mobility requires knowledge of body

mechanics and of the basic structure and function of bones and muscles, which are reviewed in detail in Chapter 35.

Scientific Knowledge Base

Physiology and Principles of Body Mechanics

Body mechanics are the coordinated efforts of the musculoskeletal and nervous systems to maintain balance, posture, and body alignment during lifting, bending, moving, and performing activities of daily living (ADLs). Use of proper body mechanics reduces risk of injury to the musculoskeletal system, facilitates mobility, and allows for efficient use of energy.

By using proper body mechanics, you help ensure the safety and well-being of both you and your patient (see Chapter 35).

Alignment and Balance. The terms **body alignment** and **posture** are analogous and refer to the positioning of the **joints, tendons, ligaments**, and muscles while standing, sitting, and lying. Being in correct *body alignment* means that the individual's centre of gravity is stable. Correct body alignment reduces strain on musculoskeletal structures, minimizes the risk of injuries and falls, aids in maintaining adequate muscle tone, and contributes to balance. Balance is enhanced with a wide base of support and correct body posture and when the body's centre of gravity is kept low and within the base of support (see Chapter 35).

Balance is required for maintaining a static position such as sitting, for performing ADLs, and for moving freely. The ability to balance can be compromised by disease, injury, pain, physical development (e.g., age), life changes (e.g., pregnancy), medications (e.g., in which dizziness or drowsiness is a side effect), and prolonged immobility, which may cause **deconditioning**. Deconditioning is a clinical syndrome that results in reduced functioning of multiple body systems, especially the musculoskeletal system. Nurses must be alert to impaired balance because it is a major threat to physical safety. Impaired balance can also lead to a patient's fear of falls and self-imposed restrictions on activity.

safety alert In Canada, falls are the sixth leading cause of death in older adults. Generalized weakness, impaired balance, and unsteady gait are risk factors for falls among older adults. Injuries from falls contribute to reduced quality of life and increased morbidity, mortality, and health care costs. Most falls in the hospital occur near the patient's bedside while trying to transfer. Nursing actions should include a thorough assessment of patient safety and implementation of strategies to prevent falls such as those outlined in the Registered Nurses' Association of Ontario (RNAO) (2005a) *Best Practice Guideline: The Prevention of Falls and Falls Injuries in the Older Adult*.

Gravity and Friction. *Weight* is the force exerted on a body by gravity. To lift safely, the lifter must overcome the weight of the object to be lifted and know its centre of gravity. In a person, the centre of gravity is usually at 55% to 57% of standing height and is located in the midline. People who are unsteady can fall as their centres of gravity become unbalanced because of the gravitational pull of their weight when it moves outside their base of support.

Friction is a force that occurs in a direction to oppose movement. As you turn, transfer, or move a patient up in bed, friction must be overcome. The larger the surface area of the object

to be moved, the greater the friction. A larger object produces greater resistance to movement. To decrease surface area and reduce friction when a patient is unable to assist in moving up in bed, place the patient's arms across the chest. This position decreases surface area and reduces friction.

Whenever possible, you should use some of the patient's strength when lifting, transferring, or moving the patient. Explain the procedure to the patient and tell the patient when and what body parts to move. The result should be a synchronized movement in which the patient can participate and in which friction is decreased. By involving the patient, you may have the added benefit of increasing the patient's participation in self-care, thus promoting his or her sense of accomplishment.

Lifting a patient, rather than pushing or pulling, can also reduce friction. Lifting has an upward component and decreases the pressure between the patient and the bed or chair. By placing the patient on a friction-reducing device (e.g., slider sheet or transfer board) and then pulling this sheet to move the patient, you can reduce friction, because the patient is raised off the surface and is more easily moved along the bed's surface (see Chapter 35).

Regulation of Movement

Coordinated body movement involves integrated functioning of the skeletal system, skeletal muscle, and nervous system. These three systems cooperate closely in mechanical support of the body. They are discussed as a single functional unit in Chapter 35.

Pathological Influences on Mobility

Many pathological conditions affect mobility, including both congenital and acquired impairments, degenerative and episodic conditions, and diseases affecting virtually every body system. Although a complete description of each is beyond the scope of this chapter, an overview of four categories of pathological influences is presented here: postural abnormalities, impaired muscle development, damage to the central nervous system, and direct trauma to the musculoskeletal system.

Postural Abnormalities. Congenital or acquired postural abnormalities affect the efficiency of the musculoskeletal system, as well as body alignment, balance, and appearance. During assessment, observe body alignment and range of motion (ROM; see Chapter 35). Postural abnormalities can cause pain, impair alignment or mobility, or both. Knowledge about the characteristics, causes, and treatment of common postural abnormalities (Table 45-1) is necessary for lifting, transferring, and positioning a patient. Some postural abnormalities may limit ROM. Nurses intervene to maintain maximum ROM in unaffected joints and then may design interventions to strengthen affected muscles and joints, improve the patient's posture, and adequately use affected and unaffected muscle groups. Referral to or collaboration with a physiotherapist and occupational therapist may enhance your interventions for a patient with a postural abnormality.

Impaired Muscle Development. Injury and disease can lead to numerous alterations in musculoskeletal function. The muscular dystrophies, for example, are a group of familial disorders that cause degeneration of skeletal muscle fibres. The most prevalent of the muscle diseases in childhood, the muscular dystrophies are characterized by progressive, symmetrical weakness and wasting of skeletal muscle

> TABLE 45-1 Postural Abnormalities

Abnormality	Description	Cause	Possible Treatments*
Torticollis	Inclining of head to the affected side, in which the sternocleidomastoid muscle is contracted	Congenital or acquired condition	Surgery, heat, support, or immobilization, depending on cause and severity, gentle range of motion
Lordosis	Exaggeration of anterior convex curve of lumbar spine	Congenital condition Temporary condition (e.g., pregnancy)	Spine-stretching exercises (based on cause)
Kyphosis	Increased convexity in curvature of thoracic spine	Congenital condition Rickets, osteoporosis Tuberculosis of the spine	Spine-stretching exercises, sleeping without pillows, use of bed board, bracing, spinal fusion (based on cause and severity)
Kypholordosis	Combination of kyphosis and lordosis	Congenital condition	Similar to methods used in kyphosis or lordosis (based on cause) Immobilization and surgery (based on cause and severity)
Scoliosis	Lateral "S" curvature of spine, unequal heights of hips and shoulders	Congenital condition Poliomyelitis Spastic paralysis Unequal leg length	Immobilization and surgery (based on age, cause, and severity)
Kyphoscoliosis	Abnormal anteroposterior and lateral curvature of spine	Congenital condition Poliomyelitis Cor pulmonale	Immobilization and surgery (based on cause and severity)
Congenital hip dysplasia	Hip instability with limited abduction of hips and, occasionally, adduction contractures (head of femur does not articulate with acetabulum because of abnormal shallowness of acetabulum)	Congenital condition (more common with breech deliveries)	Maintenance of continuous abduction of the thigh so that head of femur presses into the centre of acetabulum Abduction splints, casting, surgery
Knock-knee (genu valgum)	Legs curved inward so that knees come together as person walks	Congenital condition Rickets	Knee braces, surgery if not corrected by growth
Bowlegs (genu varum)	One or both legs bent outward at knee, which is normal until two to three years of age	Congenital condition Rickets	Slowing rate of curving if not corrected by growth With rickets, increase of vitamin D, calcium, and phosphorus intake to normal ranges
Clubfoot	95%: medial deviation and plantar flexion of foot (equinovarus) 5%: lateral deviation and dorsiflexion (calcaneovalgus)	Congenital condition	Casts, splints such as Denis-Browne splint, and surgery (based on degree and rigidity of deformity)
Footdrop	Inability to dorsiflex and evert foot because of peroneal nerve damage	Congenital condition Trauma Improper position of a patient who is immobilized	None (cannot be corrected) Prevention through physiotherapy Bracing with ankle-foot orthotic
Pigeon-toes (metatarsus adductus or metatarsus varus)	Internal rotation of forefoot or entire foot, common in infants, often accompanied by development dysplasia of the hip	Congenital condition Habit	Growth, wearing reversed shoes, casting, bracing

*Severity of the condition and its cause will dictate treatment, which must be individualized.

Source: Based on McCance, K. L., & Huether, S. E. (2010). *Pathophysiology: The biologic basis for disease in adults and children* (6th ed.). St Louis, MO: Mosby.

groups, with increasing disability and deformity (McCance & Huether, 2010).

Damage to the Central Nervous System. Damage to any component of the central nervous system that regulates voluntary movement results in impaired body mobility. The motor strip in the cerebral cortex can be damaged by trauma from a head injury, ischemia from a stroke or brain attack (cerebrovascular accident), hemorrhage, tumour, or bacterial infection such as meningitis. Motor impairment is directly

related to the amount of destruction of the motor strip. For example, a person with a right-sided cerebral hemorrhage will likely have destruction of the right motor strip and hence have left-sided **hemiplegia** (muscle paralysis) or **hemiparesis** (muscle weakness). Trauma to the spinal cord also impairs mobility. A common trauma is transection of the spinal cord in which motor fibres are cut. A complete transection will likely result in a bilateral loss of voluntary motor control below the level of the trauma. Injury above the first thoracic vertebrae

results in **quadriplegia** (also known as tetraplegia) (four-limb paralysis) and injury below that level results in **paraplegia** (two-limb paralysis).

Direct Trauma to the Musculoskeletal System.

Direct trauma to the musculoskeletal system can result in bruises, contusions, sprains, and fractures. A **fracture** is a disruption of bone tissue continuity. Fractures most commonly result from direct external trauma but can also occur as a consequence of some deformity of the bone (e.g., **pathological fractures** of osteoporosis, Paget's disease, metastatic cancer, or osteogenesis imperfecta). Young children are usually able to form new bone more easily than adults and, as a result, have few complications after a fracture. Treatment often includes positioning the fractured bone in proper alignment and immobilizing it to promote healing and restore function. Even this temporary immobilization can result in some **muscle atrophy**, loss of tone, and joint stiffness. After the fracture has healed, physiotherapy may be required to regain functional losses.

Nursing Knowledge Base

Mobility-Immobility

A full understanding of mobility requires more than an overview of body mechanics and of the regulation of movement by the musculoskeletal and nervous systems. You must also know how mobility and immobility affect the systems of the body and the psychosocial and developmental aspects of patients.

Mobility refers to a person's ability to move about freely, and **immobility** refers to the inability to move about freely. Mobility and immobility are best understood as the end points of a continuum, with many degrees of partial mobility in between. Some patients move back and forth on this continuum, but for other patients, immobility is absolute and continues indefinitely. The terms *bed rest* and *impaired physical mobility* are frequently used when discussing patients on the mobility-immobility continuum.

Bed rest is an intervention that restricts patients to bed for therapeutic reasons. Nurses and physicians most often prescribe this intervention. Patients with a wide variety of conditions are placed on bed rest. The general objectives of bed rest are as follows:

- To reduce physical activity and the oxygen needs of the body
- To reduce pain, including postoperative pain, and the need for large doses of analgesics
- To promote safety for patients recovering from the effects of anaesthetics or who are sedated
- To allow patients who are ill or debilitated to rest
- To allow patients who are exhausted the opportunity for uninterrupted rest

The duration of bed rest depends on the illness or injury and the patient's prior state of health.

Impaired physical mobility is defined by the North American Nursing Diagnosis Association as a state in which the individual experiences or is at risk of experiencing limitation of physical movement (Ackley & Ladwig, 2006). Alterations in the level of physical mobility can result from prescribed restriction of movement in the form of bed rest, physical restriction of movement because of external devices (e.g., a cast or skeletal traction), voluntary restriction of movement, or impairment of motor or skeletal function.

Periods of immobility or prolonged bed rest can cause major physiological, psychological, and social effects. These

effects can be gradual or immediate and vary from patient to patient. The greater the extent and the longer the duration of immobility, the more pronounced are the consequences. The patient with complete mobility restrictions is continually at risk for hazardous system-wide effects.

Systemic Effects of Immobility. All body systems work more efficiently with some form of movement. Exercise has been shown to have positive outcomes for all major systems of the body (see Chapter 35). Therefore, when mobility is altered, each body system is at risk for impairment. The severity of the impairment depends on the patient's overall health, degree and length of immobility, and age. For example, older adults with chronic illnesses develop pronounced effects of immobility more quickly than younger patients with the same immobility problem (Box 45-1).

Metabolic Changes. Endocrine metabolism, calcium resorption, and functioning of the gastrointestinal system are altered by changes in mobility.

The endocrine system, made up of hormone-secreting glands, helps to maintain and regulate vital functions such as response to stress and injury, growth and development, reproduction, ionic homeostasis, and energy metabolism. When injury or stress occurs, the endocrine system triggers a series of responses aimed at maintaining blood pressure and preserving life. The endocrine system is important in maintaining homeostasis. Tissues and cells live in an internal environment that the endocrine system helps regulate through maintenance of sodium, potassium, water, and acid-base balance. The endocrine system also helps regulate energy metabolism. The basal metabolic rate (BMR) is increased by thyroid hormone, and energy is made available to cells through the integrated action of gastrointestinal and pancreatic hormones (Copstead-Kirkhorn & Banasik, 2011).

Immobility disrupts normal metabolic functioning by decreasing the metabolic rate; altering the metabolism of carbohydrates, fats, and proteins; causing fluid, electrolyte, and calcium imbalances; and causing gastrointestinal disturbances such as decreased appetite and slowing of peristalsis. However, in the presence of an infectious process, patients who are immobilized may have an increased BMR as a result of fever or wound healing. Fever and repair of wounds increase cellular oxygen requirements (Copstead-Kirkhorn & Banasik, 2011).

A deficiency in calories and protein is characteristic of patients with a decreased appetite secondary to immobility. Poor nutritional intake can result in a deficiency in essential amino acids. Whereas essential amino acids cannot be made by the body and muscle is constantly being broken down and reformed, a deficiency in essential amino acids can contribute to muscle wasting. Weight loss, decreased muscle mass, and weakness are the result. When more nitrogen (the end product of amino acid breakdown) is excreted than is ingested in proteins, the body is said to have a **negative nitrogen balance**. Another metabolic change is calcium resorption (loss) from bones. As a result, urinary excretion of calcium increases because immobility causes the release of calcium into the circulation. Normally, the kidneys can excrete the excess calcium. However, if the kidneys are unable to respond appropriately, hypercalcemia results (Copstead-Kirkhorn & Banasik, 2011).

Decreased mobility also leads to decreased gastrointestinal motility, which in turn can cause a variety of impairments to gastrointestinal functioning. Difficulty in passing stools (constipation) is a common symptom, although pseudodiarrhea

BOX 45-1 NURSING STORY

Patient Rehabilitation

When Grace Lo was admitted to the inpatient rehabilitation unit, it was difficult for me to imagine her living independently in a condominium, driving her car, going out to lunch, shopping, or playing bridge with her friends. She looked so frail and tired, and she needed assistance with everything. Grace was a 66-year-old widow with a diagnosis of uterine cancer. After being diagnosed, Grace was started on chemotherapy to help shrink the size of the tumour before having surgery to remove it. She experienced side effects from the chemotherapy—*anemia and neutropenia*. Unfortunately, she also developed recurrent pneumonia and had been immobilized in the intensive care and oncology units for over five weeks.

When Grace was admitted to the rehabilitation unit, she was significantly deconditioned. She had never enjoyed exercising and was feeling regret about not maintaining her physical fitness before her cancer diagnosis. Her ability to complete her chemotherapy treatments depended on her regaining her strength, endurance, mobility, and independence for her ADLs. Grace was very motivated to work with the rehabilitation team, but she was also afraid. What if she couldn't get strong enough to finish her chemotherapy?

At the beginning of rehabilitation, Grace needed assistance from two people for all her transfers. She had a Foley catheter in place, and she fatigued quickly with minimal exertion. Her respiratory status had been compromised by recurrent pneumonia and her past behaviour of cigarette smoking. The first goal was to increase her upper and lower extremity strength for transferring from the bed to a commode at the bedside. It took a coordinated interdisciplinary approach to work on Grace's pace at exercising and her ability to practise ADLs independently. Once Grace was able to safely transfer from the bed with a one-person, minimally assisted standing pivot transfer, the team was able to focus on the goal of urinary continence. Because she had been immobilized for an extended period of time, Grace often felt lightheaded and dizzy when sitting at the bedside before a transfer. These experiences contributed to her feelings of apprehension about falling and to a loss of confidence. It was important to raise the head of Grace's bed in increments before attempting transfers to minimize postural hypotension. After two weeks of exercising and practice, Grace was continent, using the bathroom in her room. However, she still had a long way to go.

Four months after she had been discharged from rehabilitation, I heard my name being called. A fit-looking woman was calling out to me—I barely recognized a radiant Grace. She had continued outpatient rehabilitation and was exercising regularly. Grace excitedly told me that she had finished her last cycle of chemotherapy. Her computerized tomography (CT) scan showed that the tumour in her uterus had decreased in size and she no longer needed surgery. Grace told me that while the diagnosis of cancer scared her, the experiences of being immobilized and dependent on others for all her ADLs had "terrified" her. Her story reminded me of the impact of immobility on all aspects of a person's life and of the importance of setting small, attainable goals in promoting independence and hope.

may result from a fecal impaction (accumulation of hardened feces). This finding is not normal diarrhea, but rather liquid stool passing around the area of impaction (see Chapter 44). Left untreated, fecal impaction can result in a mechanical bowel obstruction that may partially or completely occlude the intestinal lumen, blocking normal propulsion of liquid and gas. The resulting fluid in the intestine produces distension and increases intraluminal pressure. Over time, intestinal

function becomes depressed, dehydration occurs, absorption ceases, and fluid and electrolyte disturbances worsen.

Respiratory Changes. Regular aerobic exercise is known to enhance respiratory functioning. Conversely, lack of movement and exercise places patients at higher risk for respiratory complications. Patients who have recently had surgery or are immobile are at high risk for developing pulmonary complications. The most common respiratory complications are **atelectasis** (collapse of alveoli) and **hypostatic pneumonia** (inflammation of the lung from stasis or pooling of secretions). Both conditions decrease oxygenation, prolong recovery, and add to the patient's discomfort (Black & Hawks, 2009). In atelectasis, secretions block a bronchiole or a bronchus, and the distal lung tissue (alveoli) collapses as the existing air is absorbed, producing hypoventilation. The site of the blockage determines the extent of atelectasis. A lung lobe or even a whole lung may collapse. At some point in the development of these complications, the patient's ability to cough productively declines proportionately. Ultimately, the distribution of mucus in the bronchi increases, particularly when the patient is in the supine, prone, or lateral position. Mucus accumulates in the dependent regions of the airways. Because mucus is an excellent medium for bacterial growth, hypostatic pneumonia may result.

Cardiovascular Changes. The cardiovascular system is also affected by immobilization. The three major changes are orthostatic hypotension, increased cardiac workload, and thrombus formation.

Orthostatic hypotension is a drop of 20 mm Hg or more in systolic blood pressure and of 10 mm Hg in diastolic blood pressure within three minutes of when the patient rises from a lying or sitting position to a standing position (Medow et al., 2008). Decreased circulating fluid volume, pooling of blood in the lower extremities, and decreased autonomic response occur when a patient is immobile. These factors result in decreased venous return, followed by a decrease in cardiac output, which is reflected by a decline in blood pressure (McCance & Huether, 2010).

As the workload of the heart increases, its oxygen consumption does as well. The heart therefore works harder and less efficiently during periods of prolonged rest. As immobilization increases, cardiac output falls, further decreasing cardiac efficiency and increasing workload.

Patients are also at risk for thrombus formation. A **thrombus** is an accumulation of platelets, fibrin, clotting factors, and the cellular elements of the blood attached to the interior wall of a vein or artery, sometimes occluding the lumen of the vessel (Figure 45-1). Three factors contribute to venous thrombus formation: (1) loss of integrity of the vessel wall (e.g., injury), (2) abnormalities of blood flow (e.g., slow blood flow in calf veins associated with bed rest), and (3) alterations in blood constituents (e.g., a change in clotting factors or increased platelet activity). These three factors are sometimes referred to as *Virchow's triad* (McCance & Huether, 2010). A dislodged venous thrombus, called an **embolus**, may travel through the circulatory system to the lungs and impair circulation and oxygenation. Venous emboli that travel to the lungs are called pulmonary emboli and may be life-threatening. More than 90% of all pulmonary emboli begin in the legs or pelvis (Copstead-Kirkhorn & Banaski, 2011).

Musculoskeletal Changes. The effects of immobility on the musculoskeletal system can include temporary or permanent impairment. Restricted mobility may result in loss of

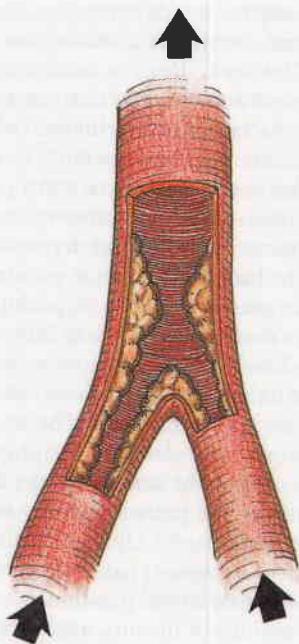


Figure 45-1 Thrombus formation in a vessel.

endurance, strength, and muscle mass as well as decreased stability and balance. Other effects of restricted mobility affecting the skeletal system are impaired calcium metabolism and impaired joint mobility.

Muscle Effects. Muscle weakness and deconditioning always occur to some extent with prolonged immobility. Protein breakdown in the absence of exercise results in a loss of lean body mass, which is composed primarily of muscle. The effect of immobility on muscle may be apparent in a matter of days. The normal individual on bed rest loses muscle strength from baseline levels at a rate of 3% a day.

The term *disuse atrophy* or muscle atrophy has been used to describe the pathological reduction in normal size of muscle fibres after prolonged inactivity from bed rest, trauma, casting, or local nerve damage (McCance & Huether, 2010). The reduced muscle mass is unable to sustain activity without increased fatigue. Loss of endurance, decreased muscle mass and strength, and joint instability (see “Skeletal Effects” section) put patients at risk for falls.

Skeletal Effects. Immobilization causes two skeletal changes: impaired calcium metabolism and joint abnormalities. Bone resorption is increased when an individual is not weight-bearing on their bones, such as during prolonged bed rest. The bone tissue is less dense, or is atrophied, and **disuse osteoporosis** results, putting the patient at risk for pathological fractures. Bone resorption also causes calcium to be released in the blood, and hypercalcemia results.

Osteoporosis is a major health concern in Canada. Eighty percent of all fractures in women over 50 are related to osteoporosis. Fragility fractures are responsible for excess mortality and morbidity (Papaioannou et al., 2010). Although primary osteoporosis is different in origin from the osteoporosis that results from immobility, it is imperative for nurses to recognize that patients who are immobile may be at high risk for accelerated bone loss if they have primary osteoporosis. Important interventions for preventing disability in patients with primary

* BOX 45-2 PATIENT TEACHING

Patients With Osteoporosis

Objective

- Patient will identify strategies to prevent or limit the severity of osteoporosis.

Teaching Strategies

- Instruct patient (and caregiver, if present) on common risk factors and how to modify lifestyle (e.g., eliminating smoking, caffeine, alcohol).
- Teach patient and caregiver the current recommended dietary allowances for calcium and vitamin D, and review foods high in calcium and vitamin D.
- Instruct patient and caregiver to do appropriate types of weight-bearing exercises as recommended by the physician or physiotherapist to prevent injury or fractures.
- Teach patient and caregiver about safety, fall prevention, and strategies to create a safe home environment.
- Instruct patient and caregiver in self-administration of appropriate medication as ordered by the physician.
- Foster a positive self-image in the patient by providing realistic yet optimistic and positive feedback about changes in the patient's appearance and mobility.

Evaluation

- Patient and caregiver identify strategies to modify the patient's lifestyle, such as stopping smoking, reducing caffeine or alcohol intake, or increasing dietary calcium.
- Patient and caregiver identify foods high in calcium and vitamin D.
- Patient and caregiver demonstrate appropriate weight-bearing exercises.
- Patient and caregiver identify safety strategies to prevent falls.
- Patient and caregiver demonstrate appropriate knowledge about medications.
- Patient and caregiver express positive but realistic feedback regarding the effects of disease.

osteoporosis who become immobilized include early patient evaluation, and consultation with and referral to physicians, dietitians, occupational therapists, and physiotherapists. For the patient with osteoporosis, the goal is to maintain independence with ADLs. Assistive ambulatory devices, adaptive clothing, and safety bars may assist the patient with maintaining independence. Patient teaching should focus on limiting the severity of the disease through diet and activity (Box 45-2).

Immobility can lead to a **joint contracture**, which is an abnormal condition characterized by fixation of a joint. It is caused by disuse, atrophy, and shortening of the muscle fibres. When a contracture occurs, the joint cannot obtain full ROM. Contractures may leave a joint in a nonfunctional position (Figure 45-2) and possibly be permanent. Early prevention of contractures is key, as they can begin to form after only eight hours of immobility in the older patient (Fletcher, 2005).

One common and debilitating contracture is **footdrop** (Figure 45-3 and Figure 45-4). When **footdrop** occurs, the foot is permanently fixed in plantar flexion and is unable to dorsiflex. Ambulation is difficult with the foot in this position because the patient is unable to lift the toes off the ground. Footdrop can be associated with a variety of etiologies, including prolonged bed rest, peroneal nerve damage, peripheral neuropathy, and cerebral vascular accidents (strokes).



Figure 45-2 A contracture of the joints in the fingers. **Source:** Sorrentino, S. A., Wilk, M. J., & Newmaster, R. (2009). *Mosby's Canadian textbook for the support worker* (2nd ed., p. 429, Fig 24-1). Toronto: Elsevier.

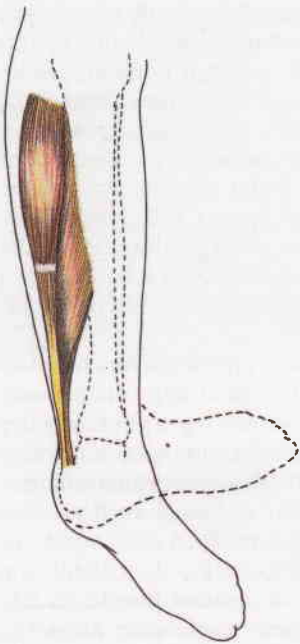


Figure 45-3 Footdrop. The ankle is fixed in plantar flexion. Normally, the ankle is able to flex (dotted line), which eases walking.



Figure 45-4 Patient with bilateral footdrop.

Urinary Elimination Changes. The patient's urinary elimination is altered by immobility. In the upright position, urine flows out of the renal pelvis and into the ureters and bladder because of gravitational forces. When the patient is recumbent or flat, the kidneys and the ureters move toward a more level plane. Urine formed by the kidney must enter the bladder unaided by gravity. Because the peristaltic contractions of the ureters are insufficient to overcome gravity, the renal pelvis may fill before urine enters the ureters. This condition, called **urinary stasis**, increases the risk of urinary tract infection and renal calculi (see Chapter 43). Renal calculi are calcium stones that lodge in the renal pelvis and pass through the ureters. Patients who are immobile are at risk for calculi because of urinary stasis as well as altered calcium metabolism and the resulting hypercalcemia.

As the period of immobility continues, fluid intake can diminish, and this increases the risk for dehydration. As a result of decreased fluid intake, urinary output may decline around the fifth or sixth day after immobilization and the urine is often highly concentrated. This concentrated urine increases the risk for calculi formation and infection. Patients who are immobile may also have less access to bathing equipment and be unable to perform adequate perineal hygiene, which may also increase the risk of urinary tract contamination by *Escherichia coli* bacteria.

Patients who are immobile may not be getting up to use the bathroom or even a bedside commode. Voiding on a bedpan or using a urinal does not provide the usual sensory stimulation to void, nor does it allow gravity to act on the bladder sphincter. Thus, patients may be unable to void at all or completely. There may be residual urine in the bladder, which increases the risk of infection. There may be complete urinary retention, which necessitates catheterization. Both intermittent catheterization and indwelling catheters increase the risk of urinary tract infections in these patients.

Integumentary Changes. Individuals who have impaired movement and/or sensation are at risk for the development of pressure ulcers. A **pressure ulcer** is an impairment of the skin as a result of prolonged ischemia (decreased blood supply) in tissues (see Chapter 46). Ischemia develops when the pressure on the skin is greater than the pressure inside the small peripheral blood vessels supplying blood to the skin. Adequate blood flow is necessary to supply oxygen and nutrients for tissue metabolism and the elimination of metabolic wastes.

People who are conscious and have voluntary muscle control and normal perception of pressure perceive decreased circulation to tissue. They change positions regularly to increase circulation to tissue and prevent the formation of pressure ulcers. Individuals with impaired sensation or mobility may require assistance to regularly reposition themselves, to avoid the development of pressure ulcers. Pressure ulcers tend to develop over bony prominences. The location of bony prominences, and hence the skin most at risk for breakdown, varies depending on patient positioning, but individuals require frequent position changes, whether they are lying down or sitting.

safety alert Implement a comprehensive skin care program to prevent skin breakdown in all patients, from neonates to older adults. Effective skin care programs include accurate and consistent assessment and documentation as well as interventions to protect the skin (e.g., turn the patient every two hours and use mechanical devices such as lifts when you need to move the patient; RNAO, 2005b).

Psychosocial Effects of Immobility. Immobilization can contribute to decreased social interaction, social isolation, sensory deprivation, loss of independence and role changes. These in turn may lead to emotional reactions, behavioural responses, sensory alterations, and changes in coping. These changes are different for each patient.

Patients who are immobilized can become depressed because of changes in role, self-concept, and other factors. Depression is an affective disorder characterized by exaggerated feelings of sadness, melancholy, dejection, worthlessness, emptiness, and hopelessness out of proportion to reality. Depression can result from worrying about present and future levels of health, finances, and family needs. Because immobilization removes the patient from a daily routine, he or she has more time to worry about disability. Worrying can in turn quickly increase the patient's depression, causing withdrawal. By assessing behavioural changes throughout a patient's restricted mobility, you will be better equipped to identify changes in self-concept, recognize early signs of depression, and develop nursing interventions.

Behavioural changes resulting from immobilization vary widely, depending on the patient. Common behavioural changes are hostility, belligerence, giddiness, fear, and anxiety. Early in the nursing process you should interview the patient's family about normal behavioural patterns to gain baseline data. If unexpected behaviours are observed later, you can intervene to reduce the effects of immobilization on the patient's behavioural patterns.

Sleep-wake alterations in the patient who is immobile may occur from nursing care or changes in habit or environment. Disruption of normal sleeping patterns can further cause behavioural changes and contribute to delirium. Nursing interventions should be used to ensure that the patient receives sufficient sleep (see Chapter 40). The patient who is on bed rest and is able to change position during sleep does not require continuous physical nursing care. Unless other treatment activities are required during the night, the care plan for the physiologically stable patient on bed rest should provide for uninterrupted sleep.

Long-term immobility or bed rest can affect usual coping patterns. Such a patient may withdraw and become passive. The passive patient allows nurses to provide care but is not interested in increasing independence or involvement in care. Early in the care of a patient who is immobile, you should assess the patient's normal coping mechanisms in order to design a nursing care plan that will accommodate the patient's coping abilities or help the patient develop new ones.

Developmental Changes. Developmental changes associated with immobility tend to occur most commonly in very young children and in older adults. The immobilized young or middle-aged adult who has been healthy may experience few, if any, developmental changes. However, exceptions exist, and patients must be fully assessed for developmental implications. One exception might be a mother who has complications at childbirth and as a result cannot interact with the newborn infant as expected.

Infants, Toddlers, and Preschoolers. The newborn infant's spine is flexed and lacks the anteroposterior curves of the adult (see Chapter 22). As the baby grows, musculoskeletal development permits support of weight for standing and walking. Posture is awkward because the head and upper trunk are carried forward. Because body weight is not evenly distributed along a line of gravity, posture is off balance, and falls occur often. When the infant, toddler, or preschooler is

immobilized, it is usually because of trauma or the need to correct a congenital skeletal abnormality. Prolonged immobilization can delay the child's gross motor skills, intellectual development, or musculoskeletal development. Nurses caring for immobilized children should plan activities that provide physical and psychosocial stimuli.

Adolescents. The adolescence stage is usually initiated by a tremendous growth spurt (see Chapter 22). Growth is frequently uneven. Prolonged immobilization may alter adolescent growth patterns. In addition, the adolescent may lag behind peers in gaining independence. When immobilization occurs, social isolation will likely be a concern for this age group.

Adults. An adult who has correct posture and body alignment feels good, looks good, and generally appears self-confident. The healthy adult also has the necessary musculoskeletal development and coordination to carry out ADLs (see Chapter 23). When periods of prolonged immobility occur, however, all physiological systems are at risk. In addition, the role of the adult may change with regard to the family or social structure. The adult may lose identity associated with a job.

Older Adults. Aging is normally associated with a progressive loss of total bone mass (strength), muscle strength, and aerobic capacity. Some of the possible causes of this loss are decreased physical activity, hormonal changes, and actual bone resorption. Older adults may walk more slowly, take smaller steps, and appear less coordinated. Thus balance is impaired, and they are at greater risk for falls and injuries (see Chapter 24). The outcomes of a fall include not only possible injury but also hospitalization, loss of independence, and psychological effects.

Older adults may experience functional-status changes secondary to hospitalization and altered mobility status (Box 45-3). They may become more physically dependent. In some older adults, immobilization can occur progressively such as from a degenerative disease or chronic illness. In others, immobilization can occur suddenly such as after a stroke. When providing nursing care for an older adult, you should develop a care plan that encourages the patient to perform as many self-care activities as possible, thereby maintaining the highest level of mobility and functionality. Nurses may inadvertently contribute to a patient's immobility by providing unnecessary help with activities such as bathing and transferring.

Critical Thinking

Critical thinking requires you to combine knowledge, experience, patient data, and professional standards. Each of these sources must be integrated into the nurse's diagnosis and care plan for the patient with impaired mobility (Figure 45-5). A creative approach can also be helpful. Best Practice Guidelines such as those developed by the Registered Nurses' Association of Ontario (RNAO) provide valuable guides for managing complications associated with immobility. In addition, many health care facilities have standards of practice related to the lifting and transferring of patients and the prevention of falls and pressure sores.

Nursing Process for Impaired Body Alignment and Mobility

By applying the nursing process and using a critical thinking approach, you can develop individualized care plans for patients with mobility impairments or risk for immobility. The

► BOX 45-3

Hazards of Immobility in Hospitalized Older Adults

For many older adults, admission to the hospital often results in functional decline. Older adults can quickly regress to a dependent state. Rapid intervention of an interdisciplinary health team is required to maintain the patient's functional capacity.

Usual aging is associated with decreased muscle strength and aerobic capacity. Ordering bed rest for patients without sufficient ambulation leads to a loss of mobility and functional decline. Immobility causes weakness, fatigue, and an increased risk for falls. It also results in shallow breathing, which may lead to pneumonia. Inadequate turning or repositioning of a patient who is immobile can result in skin breakdown and pressure ulcers.

Catheter use and improper pericare can lead to urinary tract infections. Older adults are prone to nosocomial infections (infections obtained in the health care environment) because they often have compromised immune systems. Infections, as well as medications, treatments, and translocation, often cause confusion in older adults.

Hospitalization affects the nutritional status of the older adult. Limited access to fluids causes dehydration; conversely, fluid overload occurs from improper administration of intravenous (IV) fluids. Treatments and medications can cause fluid and electrolyte imbalances, contributing to confusion in the geriatric patient.

Finally, multiple interruptions and noise in the environment impair sleep, causing fatigue, depression, and confusion. Any of these factors may thrust vulnerable older adults into a state of irreversible functional decline.

Source: Adapted from Touhy, T., Jett, K., Boscart, V., & McCleary, L. (2012). *Ebersole & Hess' gerontological nursing and healthy aging* (1st Canadian ed.). Toronto: Elsevier Canada.

aim of the care plan is to improve the patient's functional status, promote self-care, maintain psychological well-being, and reduce the hazards of immobility.

◆ Assessment

Nursing assessment is presented here in two sections: mobility and immobility. Both areas are usually assessed during the complete physical examination.

Mobility

Assessment of patient mobility focuses on ROM, gait, exercise and activity tolerance, and body alignment. When unsure of the patient's abilities, you should begin assessment of mobility with the patient in the most supportive position and move to higher levels of mobility according to the patient's tolerance. Generally, start assessing movement while the patient is lying, then proceed to assessing sitting positions in bed, transfers to chair, and, finally, gait. This sequence of assessment helps to protect the patient's safety.

Range of Motion. Range of motion (ROM) is the maximum amount of movement available at a joint in one of the four planes of the body: medial, sagittal, frontal, or transverse. The medial plane is a line through the axis of the body, separating the body into equal halves, a left side and a right side. The sagittal plane is any plane parallel to the medial plane. The frontal plane passes through the body from side to side and divides the body into front and back. The transverse plane is a horizontal line that divides the body into upper and lower portions. The anatomical position is used as a reference when

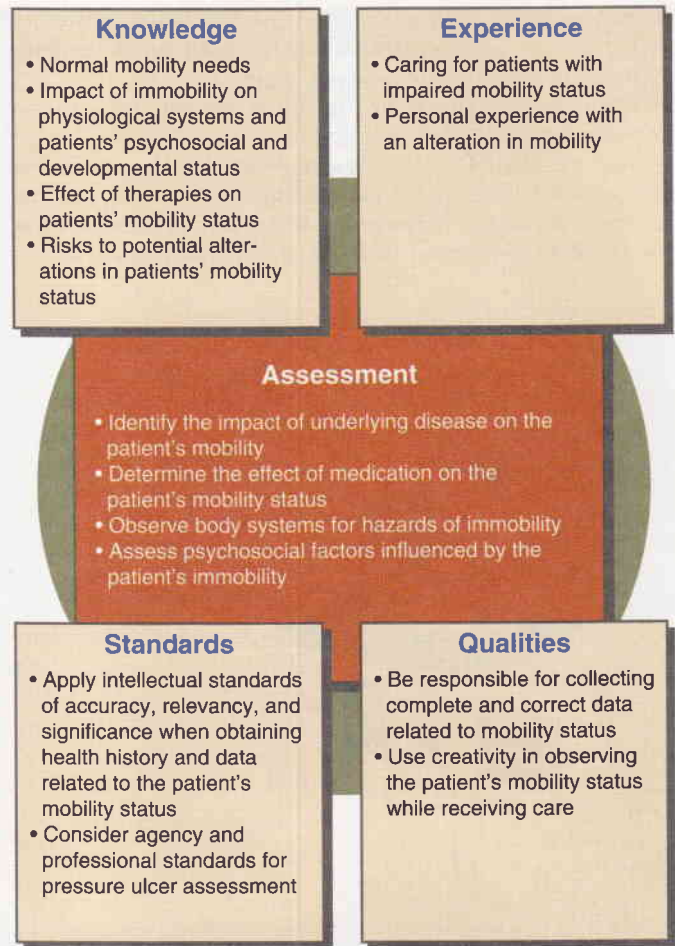


Figure 45-5 Critical thinking model for mobility assessment.

describing the parts of the body as they relate to each other (Figure 45-6).

Joint mobility is limited by ligaments, muscles, and the nature of the joint. Joint movements are described using the following terms:

- **Flexion and extension:** Flexion is decreasing the angle between two adjoining bones (bending of the joint); extension is increasing the angle between two adjoining bones (extending the joint). Examples of affected body parts are the fingers, elbows, and knees.
- **Hyperextension:** This is movement of a body part beyond its normal resting extended position.
- **Dorsiflexion and plantar flexion:** Dorsiflexion is the flexion of toes and foot upward; plantar flexion is the bending of toes and foot downward.
- **Abduction and adduction:** Abduction is movement of an extremity away from the midline of the body; adduction is movement of an extremity toward the midline of body (e.g., arms, fingers, and legs).
- **Eversion and inversion:** Eversion is the turning of a body part away from the midline; inversion is the turning of a body part toward the midline (e.g., feet).
- **Pronation and supination:** Pronation is movement of a body part so that the front or ventral surface faces downward; supination is movement of a body part so that the front or ventral surface faces upward (e.g., hands, forearm).

- **Internal and external rotation:** Internal rotation is rotation of the joint inward; external rotation is rotation of the joint outward (e.g., hip).
- **Circumduction:** This is the circular movement of a limb in a cone-shaped manner (e.g., shoulder).

When assessing ROM, physically examine the patient for stiffness, swelling, pain, limited movement, and unequal movement, and ask the patient whether any of these features are present. Assessment of ROM is important as a baseline

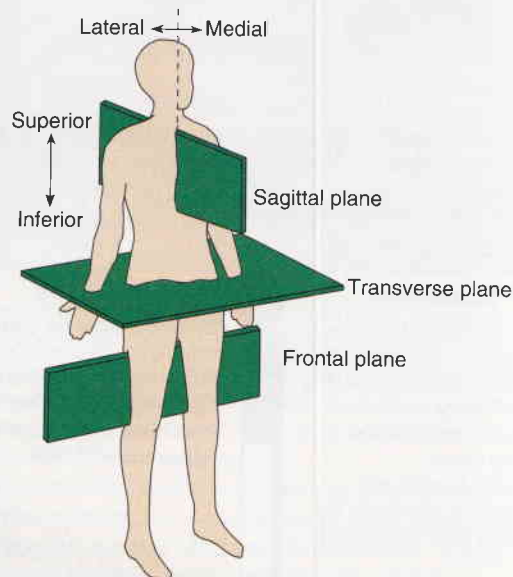


Figure 45-6 Planes of the body.

measurement to compare and evaluate whether loss in joint mobility has occurred. Patients whose mobility is restricted require ROM exercises to reduce the hazards of immobility, such as contractures. Thus, it is important to assess the type of ROM exercise a patient can perform. ROM exercises may be active (the patient is able to move all joints through his or her ROM unassisted), passive (the patient is unable to move independently, and the nurse moves each joint through its ROM), or somewhere in between (Table 45-2). With a patient who is weak, you may provide support while the patient performs most of the movement, or the patient may be able to move some joints actively while you passively move others. In general, exercises should be as active as health and mobility allow.

Body Alignment. Assessment of body alignment can be carried out with the patient lying, sitting, or standing. This assessment has the following objectives:

- To determine normal physiological changes in body alignment resulting from growth and development for each individual patient.
- To identify deviations in body alignment caused by poor posture.
- To provide opportunities for patients to observe their posture.
- To identify learning needs of patients for maintaining correct body alignment.
- To identify trauma, muscle damage, or nerve dysfunction.
- To obtain information about other factors contributing to poor alignment, such as fatigue, malnutrition, and psychological problems.

Lying. The first step in assessing body alignment is to put the patient at ease so that unnatural or rigid positions are not assumed. When assessing the body alignment of a patient who is immobilized or unconscious, pillows and positioning supports should be removed from the bed and the patient placed

TABLE 45-2 Range-of-Motion Exercises

Body Part	Type of Joint	Type of Movement	Range (Degrees)	Primary Muscles
Neck, cervical spine	Pivotal	Flexion: Bring chin to rest on chest.	45	Sternocleidomastoid
		Extension: Return head to erect position.	45	Trapezius
		Hyperextension: Bend head back as far as possible.	10	Trapezius
		Lateral flexion: Tilt head as far as possible toward each shoulder.	40–45	Sternocleidomastoid
		Rotation: Turn head as far as possible along transverse plane to look to each side.	70–90	Sternocleidomastoid, trapezius

► TABLE 45-2 Range-of-Motion Exercises—cont'd

Body Part	Type of Joint	Type of Movement	Range (Degrees)	Primary Muscles
Shoulder	Ball and socket	Flexion: Raise arm from side position forward to position above the head.	180	Coracobrachialis, biceps brachii, deltoid, pectoralis major
		Extension: Return arm to position at side of the body.	45–60	Latissimus dorsi, teres major, triceps brachii
		Hyperextension: Move arm behind body, keeping elbow straight.	180 45–60	Latissimus dorsi, teres major, deltoid
		Abduction: Raise arm to side to position above head with palm away from head.	180	Deltoid, supraspinatus
		Adduction: Lower arm sideways and across body as far as possible.	320	Pectoralis major
		Internal rotation: With elbow flexed, rotate shoulder by moving arm until thumb is turned inward and toward back.	90	Pectoralis major, latissimus dorsi, teres major, subscapularis
		External rotation: With elbow flexed, move arm until thumb is upward and lateral to head.	90	Infraspinatus, teres major, deltoid
Elbow	Hinge	Circumduction: Move arm in full circle. (Circumduction is a combination of all movements of the ball-and-socket joint.)	360	Deltoid, coracobrachialis, latissimus dorsi, teres major
		Flexion: Bend elbow so that lower arm moves toward its shoulder joint and the hand is level with the shoulder.	150	Biceps brachii, brachialis, brachioradialis
		Extension: Straighten elbow by lowering hand.	150	Triceps brachii

Continued

► TABLE 45-2 Range-of-Motion Exercises—cont'd

Body Part	Type of Joint	Type of Movement	Range (Degrees)	Primary Muscles
Forearm	Pivotal	Supination: Turn lower arm and hand so that the palm is up. Pronation: Turn lower arm so that the palm is down.	70–90 70–90	Supinator, biceps brachii Pronator teres, pronator quadratus
Wrist	Condyloid			
		Flexion: Move palm toward inner aspect of forearm.	80–90	Flexor carpi ulnaris, flexor carpi radialis
		Extension: Move fingers and hand posterior to midline.	80–90	Extensor carpi radialis brevis, extensor carpi radialis longus, extensor carpi ulnaris
		Hyperextension: Bring dorsal surface of hand back as far as possible.	80–90	Extensor carpi radialis brevis, extensor carpi radialis longus, extensor carpi ulnaris
		Abduction (radial deviation): Place hand with palm up and extend wrist laterally toward the thumb.	Up to 30	Flexor carpi radialis, extensor carpi radialis brevis, extensor carpi radialis longus
Fingers	Condyloid hinge	Adduction (ulnar deviation): Place hand with palm up and extend wrist medially toward the fifth finger.	30–50	Flexor carpi ulnaris, extensor carpi ulnaris
		Flexion: Make a fist.	90	Lumbricales, interosseus volaris, interosseus dorsalis
		Extension: Straighten fingers.	90	Extensor digiti quinti proprius, extensor digitorum communis, extensor indicis proprius
		Hyperextension: Bend fingers back as far as possible.	30–60	
		Abduction: Spread fingers apart.	30	Interosseus dorsalis
		Adduction: Bring fingers together.	30	Interosseus volaris

► TABLE 45-2 Range-of-Motion Exercises—cont'd

Body Part	Type of Joint	Type of Movement	Range (Degrees)	Primary Muscles
Thumb	Saddle	Flexion: Move thumb across palmar surface of hand.	90	Flexor pollicis brevis
		Extension: Move thumb straight away from hand.	90	Extensor pollicis longus, extensor pollicis brevis
		Abduction: Extend thumb laterally (usually done when placing fingers in abduction and adduction).	30	Abductor pollicis brevis
		Adduction: Move thumb back toward hand.	30	Adductor pollicis obliquus, adductor pollicis transverses
		Opposition: Touch thumb to each finger of the same hand.		Opponeus pollicis, opponeus digiti minimi
Hip	Ball and socket	Flexion: Move leg forward and up.	90–120	Psoas major, iliacus, sartorius
		Extension: Move leg back beside other leg.	90–120	Gluteus maximus, semitendinosus, semimembranosus
		Hyperextension: Move leg behind the body.	30–50	Gluteus maximus, semitendinosus, semimembranosus
		Abduction: Move leg laterally away from the body.	30–50	Gluteus medius, gluteus minimus
		Adduction: Move leg back toward medial position and beyond, if possible.	30–50	Adductor longus, adductor brevis, adductor magnus
		Internal rotation: Turn foot and leg toward other leg.	90	Gluteus medius, gluteus minimus, tensor fasciae latae
		External rotation: Turn foot and leg away from other leg.	90	Obturatorius internus, obturatorius externus
		Circumduction: Move leg in a circle.		Psoas major, gluteus maximus, gluteus medius, adductor magnus

Continued

► TABLE 45-2 Range-of-Motion Exercises—cont'd

Body Part	Type of Joint	Type of Movement	Range (Degrees)	Primary Muscles
Knee		Flexion: Bring heel back toward back of thigh.	120–130	Biceps femoris, semitendinosus, semimembranosus, sartorius
		Extension: Return leg to the floor.	120–130	Rectus femoris, vastus lateralis, vastus medialis, vastus intermedius
Ankle		Dorsiflexion: Move foot so that toes are pointed upward.	20–30	Tibialis anterior
		Plantar flexion: Move foot so that toes are pointed downward.	45–50	Gastrocnemius, soleus
Foot		Inversion: Turn sole of foot medially.	10 or less	Tibialis anterior, tibialis posterior
		Eversion: Turn sole of foot laterally.	10 or less	Peroneus longus, peroneus brevis
Toes		Flexion: Curl toes downward.	30–60	Flexor digitorum, lumbricalis pedis, flexor hallucis brevis
		Extension: Straighten toes.	30–60	Extensor digitorum longus, extensor digitorum brevis, extensor hallucis longus
		Abduction: Spread toes apart.	15 or less	Abductor hallucis, interosseus dorsalis
		Adduction: Bring toes together.	15 or less	Adductor hallucis, interosseus plantaris

in the supine position. Observe for the following signs of good body alignment:

- The head is midline.
- The shoulders and hips are straight and parallel.
- The thighs are relaxed and legs are slightly and equally externally rotated.
- The ankles are slightly plantar flexed.
- The arms lie at the sides with elbows and fingers slightly flexed.
- The person appears comfortable.

Assessment of body alignment should also be done in the lateral position. Again, all positioning supports should be removed from the bed except for the pillow under the head, and the body should be supported by an adequate mattress (Figure 45-7). This position allows for full view of the spine and back and will help provide other baseline body alignment

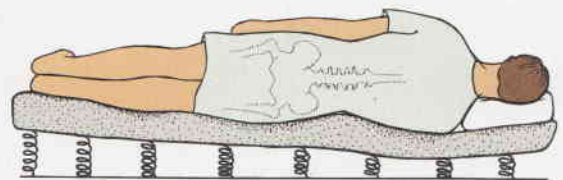


Figure 45-7 Lateral lying position for assessment of body alignment.

data, such as whether the patient can remain positioned without aid. The vertebrae should be aligned, and the position should not cause discomfort.

Sitting. Assess body alignment when the patient is sitting in a chair or wheelchair by observing for the following (Figure 45-8):



Figure 45-8 Correct body alignment when sitting. The patient's feet are flat on the floor, the calves do not touch the chair, and the back is straight and against the back of the chair. **Source:** Sorrentino, S. A., Wilk, M.J. & Newmaster, R. (2009). *Mosby's Canadian textbook for the support worker* (2nd ed., p. 412, Fig 23-20). Toronto: Elsevier.

- The head is erect, and the neck and vertebral column are in straight alignment.
- The body weight is evenly distributed on the buttocks and thighs.
- The thighs are parallel and in a horizontal plane.
- Both feet are supported on the floor or on wheelchair footrests. With patients who are short, a footstool is used and the ankles are comfortably flexed.
- A 2.5- to 5-cm space is maintained between the edge of the seat and the popliteal space on the posterior surface of the knee. This space ensures that no pressure is on the popliteal artery or nerve to decrease circulation or impair nerve function.
- The patient's forearms are supported on the armrest, in the lap, or on a table in front of the chair.

It is particularly important to assess alignment when sitting if the patient has muscle weakness, muscle paralysis, or nerve damage. Proper alignment while sitting reduces the risk of musculoskeletal system damage. The patient with severe respiratory disease may assume a posture of leaning on a table in front of the chair in an attempt to breathe more easily.

Standing. When the patient is standing, check for the following signs of good body alignment:

- The head is erect and midline.
- When observed posteriorly, the shoulders and hips are straight and parallel.
- When observed posteriorly, the vertebral column is straight.
- When the patient is observed laterally, the head is erect and the spinal curves are aligned in a reversed "S" pattern. The cervical vertebrae are anteriorly convex, the thoracic vertebrae are posteriorly convex, and the lumbar vertebrae are anteriorly convex.
- When observed laterally, the abdomen is comfortably tucked in and the knees and ankles are slightly flexed. The person appears comfortable and does not seem conscious of the flexion of knees or ankles.
- The arms hang comfortably at the sides.
- The feet are placed slightly apart to achieve a base of support, and the toes are pointed forward.
- When the patient is viewed anteriorly, the centre of gravity is in the midline, and the line of gravity is from the middle

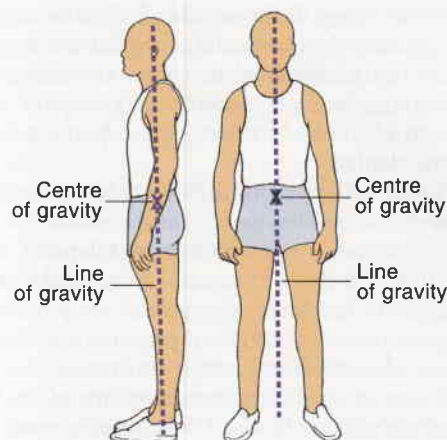


Figure 45-9 Correct body alignment when standing.

of the forehead to a midpoint between the feet. Laterally, the line of gravity runs vertically from the middle of the skull to the posterior third of the foot (Figure 45-9).

Gait. The term **gait** is used to describe a particular manner or style of walking. The gait cycle begins with the heel strike of one leg and continues to the heel strike of the other leg. Assessment of a patient's gait helps you to draw conclusions about balance, posture, safety, and ability to walk without assistance. The mechanics of human gait involve coordination of the skeletal, neurological, and muscular systems of the human body.

Exercise and Activity Tolerance. Exercise is physical activity for conditioning the body, improving health, and maintaining fitness. It can be used as therapy to correct a deformity or to restore the overall body to a maximal state of health. When a person exercises, physiological changes occur in body systems (see Chapter 35).

Assessment of the patient's energy level includes assessment of the physiological effects of exercise and activity tolerance. **Activity tolerance** is the type and amount of exercise or work that a person is able to perform. It is important to assess a patient's activity tolerance when planning activities for the patient such as walking or ADLs such as bathing. To assess activity tolerance, you will need data from physiological, emotional, and developmental domains (see Chapter 35). This assessment is applicable in all clinical settings and can be quickly completed.

When activity begins, you should monitor patients for symptoms such as dyspnea, fatigue, chest pain, or change in vital signs from baseline. Some patients may be unable to sustain activity because the energy needed to complete the activity creates fatigue and generalized weakness. Even simple tasks such as eating or moving in bed may need to be monitored. If you note decreased activity tolerance, carefully assess the time needed by the patient to recover. A decreasing recovery time may indicate improved activity tolerance.

People who are depressed, worried, or anxious are frequently unable to tolerate exercise. Patients who are depressed are usually not motivated to participate. Patients who are worried or anxious tire easily because they expend a great deal of energy in states of worry and anxiety. Thus, they may experience physical and emotional exhaustion.

Developmental changes also affect tolerance for activity. As the infant enters the toddler stage, the activity level increases

and the need for sleep declines. The child entering preschool or primary grades expends mental energy in learning and may require more rest after school or before strenuous play. The adolescent going through puberty may require more rest because much of the body's energy is expended for growth and hormone changes.

Changes may still occur through the adult years, but many of these changes are related to work and lifestyle choices. Pregnancy may decrease a woman's energy tolerance, especially during the first and third trimesters. Hormonal changes and fetal development use body energy, and the woman may be unable or unmotivated to carry out physical activities. During the last trimester, fetal development consumes a great deal of the mother's energy, and the size and location of the fetus may limit the mother's ability to take a deep breath, resulting in less oxygen being available for physical activities.

As the person grows older, activity tolerance changes. Muscle mass is reduced, posture changes, and the composition of bones is altered. Changes often occur in the cardiopulmonary system, such as decreased maximum heart rate and decreased lung compliance, that affect the intensity of exercise. The older adult may still exercise but will do so at a reduced intensity. The more inactive a patient becomes, the more pronounced these activity changes are.

Immobility

Physiological Assessment. To assess the patient for hazards of immobility, you will need to perform a head-to-toe physical assessment (see Chapter 31). The nursing assessment should focus on certain physiological areas, as well as on the patient's psychosocial and developmental dimensions. The physiological hazards of immobility that may be identified during a nursing assessment are summarized below and in Table 45-3.

Metabolic System. When assessing metabolic functioning, use **anthropometric measurements** (measures of height, weight, and skin fold thickness) to evaluate muscle atrophy. In addition, you may need to analyze intake and output records to determine whether a fluid imbalance exists (see Chapter 39). Dehydration and edema can increase the rate of skin breakdown in a patient who is immobilized. Monitoring laboratory data such as electrolytes, serum protein (albumin and total protein) levels, and blood urea nitrogen can help you determine metabolic functioning.

Assessment of wound healing and monitoring of food intake and elimination patterns will help to determine altered gastrointestinal functioning and potential metabolic problems. If a patient who is immobile has a wound, the rate of healing indicates how well nutrients are being delivered to tissues. Normal progression of healing indicates that metabolic needs of injured tissues are being met. Anorexia occurs commonly in patients who are immobilized. The patient's food intake should be assessed before the meal tray is removed to determine the amount eaten. Nutritional imbalances can be avoided if you assess the patient's dietary patterns and food preferences early in immobilization (see Chapter 42).

Respiratory System. A respiratory assessment should be performed at least every two hours for patients with restricted activity. Inspect chest wall movements during the full inspiratory-expiratory cycle. If a patient has an atelectatic area, chest movement may be asymmetrical. In addition, auscultate the entire lung region to identify diminished breath sounds, crackles, or wheezes. Auscultation should focus on the

► TABLE 45-3

Physiological Hazards of Immobility

System	Assessment Techniques	Abnormal Findings
Metabolic	Inspection	Slowed wound healing, abnormal laboratory data
	Inspection Anthropometric measurements (mid-upper arm circumference, triceps skinfold measurement)	Muscle atrophy Decreased amount of subcutaneous fat
Respiratory	Palpation Inspection	Generalized edema Asymmetrical chest wall movement, dyspnea, increased respiratory rate
	Auscultation	Crackles, wheezes, decreased air entry
Cardiovascular	Auscultation Auscultation, palpation	Orthostatic hypotension Increased heart rate, third heart sound, weak peripheral pulses
	Inspection	Dependent edema in feet and legs (if seated) and in sacrum (if lying)
Musculoskeletal	Inspection, palpation	Decreased range of motion, erythema, increased diameter in calf or thigh
	Palpation Inspection	Joint contracture Activity intolerance, muscle atrophy, joint contracture
Elimination	Inspection	Decreased urine output, cloudy or concentrated urine, decreased frequency of bowel movements
	Palpation	Distended bladder and abdomen
Skin	Auscultation Inspection, palpation	Decreased bowel sounds Break in skin integrity

dependent lung fields because pulmonary secretions tend to collect in these lower regions. Perform a complete respiratory assessment to identify the presence of secretions and to determine nursing interventions necessary for optimal respiratory function.

Cardiovascular System. Cardiovascular assessment of the patient who is immobile includes blood pressure monitoring, evaluation of apical and peripheral pulses, and observation for signs of venous stasis (e.g., edema and poor wound healing). All patients should have their vital signs monitored during the first few attempts at sitting or standing.

When getting the patient from a supine position into a chair, move the patient gradually. When performing this procedure, assess and document orthostatic changes. First, obtain baseline

blood pressure and pulse measurements with the patient in the supine position, and then assist the patient to a position sitting at the side of the bed. The patient should remain sitting for three minutes before you take the blood pressure and pulse. Remain with the patient in a sitting position and continually monitor the patient for dizziness or lightheadedness. If the patient has no dizziness or drop in blood pressure (≥ 20 mm Hg systolic or 10 mm Hg diastolic), assist the patient to a standing position and retake the blood pressure and pulse immediately when the patient stands and again after three minutes of standing. The patient should be monitored closely for dizziness throughout this procedure. The longer the period of immobility, the greater the risk of hypotension when the patient stands (Copstead-Kirkhorn & Banasik, 2011).

You will also need to assess the apical and peripheral pulses. Recumbency increases cardiac workload and pulse rate. In some patients, particularly older adults, the heart may not tolerate the increased workload, and a form of cardiac failure may develop. A third heart sound, heard at the apex with the bell of the stethoscope, can be an early indication of heart failure. Monitoring of peripheral pulses will enable you to evaluate the heart's ability to pump blood. The absence of a peripheral pulse in the lower extremities, particularly one that was previously present, should be documented and reported to the physician.

Edema may develop in patients who have had injury or whose heart is unable to handle the increased workload of bed rest. Because edema moves to dependent body regions, assessment of the patient who is immobile should include the sacrum, legs, and feet. If the heart is unable to tolerate the increased workload, peripheral body regions, such as the hands, feet, nose, and earlobes, will be colder than central body regions. Edema can be caused by other means such as renal impairment and certain medications such as steroids. The nurse must look for other sources of edema beyond heart failure and immobility.

Finally, assess the venous system, because deep vein thrombosis (DVT) is a hazard of restricted mobility. To assess for a DVT, remove the patient's elastic stockings or sequential compression devices (SCDs) every eight hours and observe the calves for redness, warmth, and tenderness. Homans' sign, or calf pain on dorsiflexion of the foot, was once used as an indicator of a probable thrombus, but this sign is not always present. Checking for Homans' sign may be contraindicated in a suspected DVT, as some investigators think that vigorous dorsiflexion may dislodge the thrombus. In addition, calf circumference should be measured daily. To do this, mark a point on each calf 10 cm from the midpatella. The circumference is measured each day using the mark for placement of the tape measure. Unilateral increases in calf diameter can be an early indication of thrombosis. Because DVTs can also occur in the thigh, you should measure the thighs daily if the patient is prone to thrombosis. In many patients, DVTs can be prevented by active exercise and compression devices in conjunction with prescribed anticoagulant treatment.

If a patient has a DVT, an embolus can dislodge and travel to the lung, causing a pulmonary embolism (PE). The signs and symptoms of PE vary depending on the size of the embolus and hence the extent of occlusion of the pulmonary vasculature. A massive PE can cause sudden and profound shock, including hypotension, tachycardia, tachypnea, hypoxia, and chest pain. Individuals can die within hours if the PE is not identified and treated quickly (McCance & Huether, 2010).

Musculoskeletal System. Major musculoskeletal abnormalities that may be identified during nursing assessment include decreased muscle tone and strength, loss of muscle mass, and contractures. The anthropometric measurements described previously may indicate losses in muscle tone and muscle mass.

Early assessment of ROM is important as a baseline against which later measurements can be compared to evaluate whether a loss in joint mobility has occurred. ROM can be measured with a goniometer.

Disuse osteoporosis cannot be identified by physical assessment. However, patients on prolonged bed rest, postmenopausal women, patients taking steroids, and people with increased serum and urine calcium levels have a greater risk for bone demineralization. The risk of disuse osteoporosis should be considered when planning nursing interventions. Not only may falls result in injury but they may also occur because of pathological fractures secondary to osteoporosis. Patients who are at risk for osteoporosis should have their diet assessed for calcium intake (Papaioannou et al., 2010).

Elimination System. The patient's elimination status should be evaluated on each shift, and total intake and output should be evaluated every 24 hours and compared over time. You should determine that the patient is receiving the correct amount and type of fluids orally or parenterally (see Chapter 39).

Assessment of elimination status should also include an analysis of dietary and fluid intake, review of medications, monitoring of the frequency and consistency of bowel movements, and an abdominal examination (RNAO, 2011) (see Chapter 44). With accurate assessment, you will be able to intervene before constipation and fecal impaction occur.

Integumentary System. Early identification of high-risk patients and their risk factors can aid you in preventing pressure ulcers (see Chapter 46). Continually assess the patient's skin for breakdown and colour changes such as pallor or redness. The skin should be observed when the patient is turned, during hygiene measures, and when elimination needs are provided for. At a minimum, assessment should occur every two hours (RNAO, 2005b).

Psychosocial Assessment. Many alterations in psychological, sociocultural, cognitive, and developmental functioning are related to immobility. Often these problems are interrelated. Nursing care must focus on all of these dimensions, not just on physical problems (Box 45-4).

Abrupt changes in cognition may have a physiological cause, such as surgery, a medication reaction, a pulmonary embolus, or an acute infection. For example, compromised older patients have confusion as their primary symptom when experiencing a pulmonary emboli or an acute urinary tract infection. Identifying confusion is an important component of the nurse's assessment. Acute confusion in older adults is not normal and should be thoroughly examined (RNAO, 2010b; Touhy et al., 2012).

Common reactions to immobilization are boredom, feelings of isolation, depression, and anger. Determine the patient's emotional background, including any history of anxiety or depression. Explore the patient's family and social network to identify those at greater risk for social isolation and their available resources. Observe for changes in a patient's emotional status. Examples of change that may indicate psychosocial concerns are a cooperative patient who becomes less cooperative or an independent patient who asks for more help than is

BOX 45-4 RESEARCH HIGHLIGHT

The Meaning of Mobility

Research Focus

It is widely known that decreased mobility contributes to physical and psychological impairment. Little is known, however, about the significance of mobility to other residents and to nurses in long-term care facilities. The purpose of this study was to determine nurses' and residents' perceptions of mobility in order to develop strategies that would support mobility in the institutionalized adult.



Research Abstract

In this exploratory, qualitative study by Bourret et al. (2002), residents and nursing staff made up focus groups in three long-term care facilities. A total of 20 residents and 15 nurses participated in the study. When asked about the importance of mobility, both groups identified it as key to quality of life. Older adults equated mobility with freedom, choice, and independence. Nurses valued mobility and associated it with freedom and autonomy. Both nurses and residents viewed having to wait for assistance as an impediment to mobility. Nurses identified further obstacles such as heavy workload and lack of time. Residents focused on physical barriers such as steep ramps, crowded elevators, and the negative attitudes of staff.

Evidence-Informed Practice

- Mobility is central to patients' quality of life and well-being.
- Nurses play a key role in assessing and assisting patients with their mobility needs.
- Nurses should focus on minimizing obstacles to mobility.
- Nurses should coordinate with other health care providers to meet patients' mobility needs.
- Nurses need to use creative strategies to encourage mobility in older adults.

Reference: Bourret, E., Bernick, L., Cott, C., & Kontos, P. (2002). The meaning of mobility for residents and staff in long-term care facilities. *Journal of Advanced Nursing*, 37(4), 338–345.

necessary. Try to determine the reasons for such alterations. Identify how the patient usually copes with loss (see Chapters 28 and 29). A change in mobility status, whether permanent or not, may cause a grief reaction. Families are a key resource for information about behaviour changes.

Unexplained changes in the sleep–wake cycle must be recognized and corrected. Most can be prevented or minimized, such as those occurring because of nursing activities, a noisy environment, or discomfort. They may also occur because of the effects of medications such as analgesics, sleeping pills, or cardiovascular drugs (see Chapter 40).

Whereas psychosocial changes usually occur gradually, observe the patient's behaviour on a daily basis. If behavioural changes occur, determine the causes and evaluate the changes as short or long term. Identification of the cause will help you to design appropriate nursing interventions. For example, a fear of falling often limits the bariatric or elderly patients' mobility; fear may be related to past experiences of falling and not being able to get up (RNAO, 2005a). Interventions include encouraging the patient to lean forward before standing rather than standing straight up, and teaching the patient how to get up and down from the floor, with assistance if needed.

Developmental Assessment. Assessment of the patient who is immobilized should include developmental

considerations to ensure that the patient's needs are identified. When caring for a young child, determine whether the child can meet developmental tasks and is progressing normally. The child's development may regress or be slowed because of immobilization. By identifying a child's overall developmental needs, you can design nursing therapies to maintain normal development. You may also need to assure the parents that developmental delays are usually temporary.

Immobilization of a family member changes the family's functioning. The family's response to this change may lead to problems, stress, and anxieties. Children seeing parents who are immobile may have difficulty understanding what is occurring and may have difficulty coping.

Immobility can have a significant effect on the older adult's levels of health, independence, and functional status. Nursing assessment will enable you to determine the older patient's ability to meet needs independently and to adapt to developmental changes such as declining physical functioning and altered family and peer relationships. A decline in developmental functioning needs prompt investigation to determine why the change occurred and what can be done to return the patient to an optimal level of functioning as soon as possible. Activities that reduce immobility and promote participation in ADLs are vital to prevent functional decline (Kawamoto et al., 2006). Assessment should also include the patient's home and community to identify factors that are risks to the patient's mobility and safety (see Chapter 36).

Patient Expectations

Patients may have unrealistic expectations of themselves or their caregivers. They may agree with the staff and understand their limitations, or they may set their expectations of themselves too high or too low. Some patients may expect to be waited on, and other patients may want to do as much as possible. Ask patients to explain what they know about their mobility status, what questions they and their families have, and how the immobility is affecting their goals.

❖Nursing Diagnosis

A patient who is partially or completely immobilized may have one or more nursing diagnoses. The two diagnoses most directly related to mobility problems are *impaired physical mobility* and *risk for disuse syndrome*. The diagnosis of *impaired physical mobility* is used for the patient who has some limitation but is not completely immobile. The diagnosis of *risk for disuse syndrome* should be considered for the patient who is immobile and at risk for multisystem pathophysiology because of inactivity. The list of potential diagnoses is extensive, because immobility affects multiple body systems:

- *Activity intolerance*
- *Ineffective airway clearance*
- *Ineffective breathing pattern*
- *Ineffective individual coping*
- *Risk for disuse syndrome*
- *Risk for fluid volume deficit*
- *Impaired gas exchange*
- *Risk for infection*
- *Risk for injury*
- *Impaired physical mobility*
- *Impaired skin integrity*
- *Risk for impaired skin integrity*
- *Disturbed sleep pattern*

BOX 45-5 NURSING DIAGNOSTIC PROCESS

Assessment Activities	Defining Characteristics	Nursing Diagnosis
Measure range of motion (ROM) during exercises of extremities.	Patient has limited ROM with left shoulder. Patient has impaired coordination while attempting to perform ROM with left shoulder.	<i>Impaired physical mobility related to left shoulder pain.</i>
Observe patient use left shoulder in activities of daily living.	Patient is reluctant to attempt movement with left shoulder.	
Ask patient about perception of pain.	Patient complains of sharp pain in shoulder.	
Ask patient about endurance and activity tolerance.	Patient reports decreased muscle strength in left shoulder.	

- *Social isolation*
- *Ineffective (peripheral) tissue perfusion*
- *Impaired urinary elimination*

Through assessment you should find clusters of data indicating whether a patient is at risk or if an actual problem exists. Such clusters of data should include defining characteristics that support the diagnostic label and probable cause of the diagnosis. It is important to determine the probable cause of the diagnosis (on the basis of assessment data) in order to plan patient-centred goals and subsequent nursing interventions. For example, *impaired physical mobility related to bed rest* requires different interventions than those for *impaired physical mobility related to pain in the left shoulder*. Thus, you must identify and cluster defining characteristics that support the nursing diagnosis selected (Box 45-5).

Often, the physiological dimension is the major focus of nursing care for patients with impaired mobility, and the psychosocial and developmental dimensions are neglected. However, all dimensions are important to health. For example, during immobilization, social interaction and stimuli tend to be decreased. Ultimately, the patient may become isolated, withdrawn, and bored. Such patients may frequently use the call bell to request minor physical attention when their real need is greater socialization. Nursing diagnoses for health needs in developmental areas reflect changes from the patient's normal activities. Immobility can lead to a developmental crisis if the patient is unable to resolve problems and continue to mature.

Immobility may also lead to complications such as pulmonary emboli or pneumonia. If these conditions develop, you will need to collaborate with the physician or nurse practitioner for prescribed therapy to intervene.

Planning

During planning, you will need to synthesize information from resources such as knowledge of the roles of respiratory

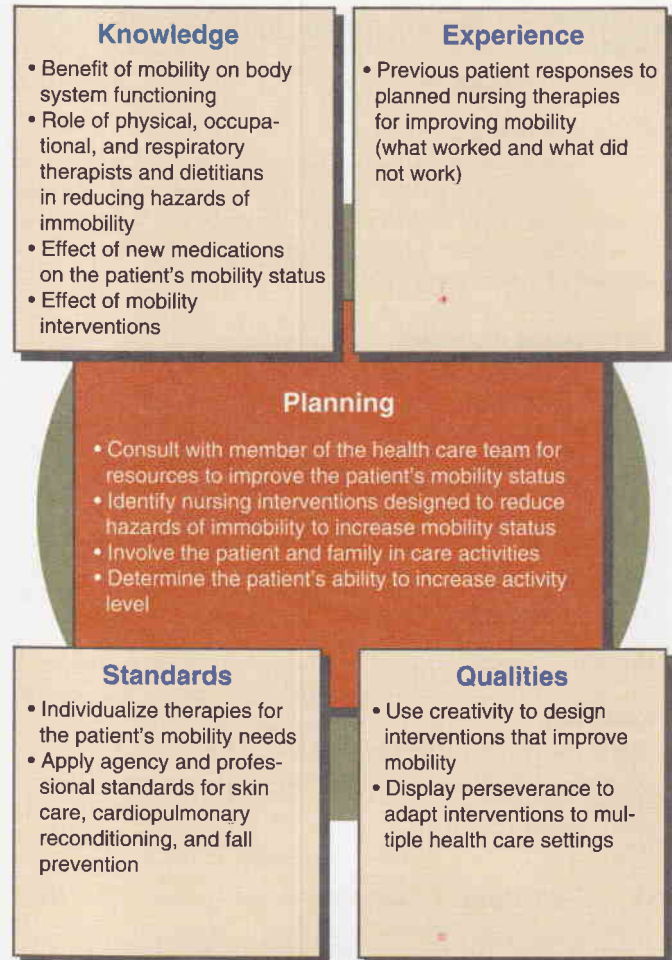


Figure 45-10 Critical thinking model for immobility planning.

therapy, occupational therapy, and physiotherapy; professional standards such as the RNAO (2005a, 2005b, 2007) guidelines for prevention of falls and pressure ulcers; qualities involving creativity and perseverance; and past experience with similar patients (Figure 45-10).

Goals and Outcomes

Develop an individualized care plan for each nursing diagnosis (Box 45-6). You and the patient, including the family, should mutually develop goals and expectations for care. Goals are to be individualized, realistic, and measurable, focusing on prevention of problems or risks to body alignment and mobility.

The goals and expected outcomes are developed to assist the patient in achieving his or her highest level of mobility. In addition, these goals may be written to reduce the hazards of immobility. For example, a patient who has left-sided paralysis after a stroke may have two long-term goals. The first, directed toward improved mobility, may be "Patient uses walker to ambulate around the home and grocery store." A parallel goal, directed toward the hazards of immobility, may be "Patient's skin remains free of pressure." Both of these goals are essential to restoring maximum mobility for this patient. Because sensation is impaired, both the patient and caregivers must be aware of the patient's need to have the skin free of pressure. Expected outcomes for the second goal follow on p. 1215:

► BOX 45-6 NURSING CARE PLAN

Impaired Physical Mobility

Assessment

Ms. Barbara Adams, an 84-year-old patient, has been admitted for rehabilitation after a total hip replacement for osteoarthritis five days ago. The wound is clean, dry, and intact. Staples are to be removed in nine days. She is weight bearing as tolerated (WBAT). She is not able to safely transfer independently from a chair to the bed. She states that she is “afraid of falling” and frequently refuses to get out of bed. She rates her pain as a 2 on a scale of 0 to 10. Ms. Adams has a history of smoking. She states that she needs pain medication to help her sleep during the night but does not need any during the day.

Assessment Activities

Assess Ms. Adams’s pain level.

Findings and Defining Characteristics

She rates her pain as a 2 on a scale of 0 to 10. She states that she needs pain medication at night to help her sleep, but does not need any during the day.

Assess Ms. Adams’s ability to transfer.

She is not able to transfer without help from chair to bed.

Ask Ms. Adams how her surgery has affected her mobility.

She responds that she is “afraid of falling,” and she frequently refuses to get out of bed.

Assess Ms. Adams’s wound status.

Wound is clean, dry, and intact.

Nursing Diagnosis: Impaired physical mobility related to musculoskeletal impairment from surgery and a fear of falling.

Planning

Goals (Nursing Outcomes Classification)*

Ms. Adams will be free from skin breakdown by discharge.

Expected Outcomes

Tissue Integrity: Skin

Patient’s skin will remain intact.

Patient’s skin will be free of erythema.

Ms. Adams will exhibit no evidence of deep vein thrombosis (DVT) by discharge.

Tissue Perfusion: Peripheral

Patient’s calf diameters will remain within 1 cm of baseline through discharge.

Patient’s lower extremity pulses will remain equal.

Patient will have no complaints of calf pain.

Ms. Adams will be able to safely transfer with assistance within two days.

Mobility Level

Patient will transfer with assistance three times per day within two days.

Patient will state fear of falling during transfer is less within two days.

*Outcome classification labels from Moorhead, S., Johnson, M., Maas, M. L., & Swanson, E. (Eds.). (2007). *Nursing outcomes classification (NOC)* (4th ed.). St Louis, MO: Mosby.

Interventions (Nursing Interventions Classification)[†]

Circulatory Care

Administer low-dose heparin as ordered.

Rationale

Administration of low-dose heparin has been shown to reduce risk for vein thrombosis.

Apply graduated compression stockings as ordered and remove them each shift for hygiene.

Application increases venous tone, improving venous return and reducing venous stasis.

Reinforce antiembolic exercises while awake.

Exercises promote venous return.

Assist patient out of bed slowly.

Moving slowly will decrease the likelihood of orthostatic hypotension.

Moving the patient slowly will also avoid the perception by the patient of being rushed, which may cause the patient to become fearful.

► BOX 45-6 NURSING CARE PLAN—cont'd

Interventions (Nursing Interventions Classification)[†]

Skin Surveillance

Instruct patient to shift position every 1 to 1.5 hours while awake.

Rationale

Position changes should occur every 1 to 1.5 hours or more frequently if needed. This reduces the risk of pressure ulcer development.

When recumbent, place patient in 30-degree lateral position.

The 30-degree lateral position reduces pressure from the sacral area and reduces the risk of skin breakdown (RNAO, 2007).

Keep patient's heels off of bed by placing a pad under the lower legs.

Use of a thin pad under the lower legs raises the heels just enough so that a paper can slide between the heels and the bed, thereby reducing the pressure on the heels so that tissue blood flow is maintained (RNAO, 2005b).

Positioning

Explain positioning procedure to patient.

Reduces anxiety

Refer patient to physiotherapy for transfer training.

Helps to strengthen muscles used in transfer

Encourage patient to assist in transfer and positioning.

Promotes independence

Teach patient safe positioning after total hip replacement, for example, no hip flexion >90 degrees, do not cross legs, do not lie on affected side, and when in bed use a pillow between the knees.

Minimizes risk of dislocation of hip. Patient education is important for continued rehabilitation and healing

[†]Intervention classification labels from Bulechek, G. M., Butcher, H. K., & Dochterman, J. M. (2008). *Nursing interventions classification (NIC)* (5th ed.). St Louis, MO: Mosby.

Evaluation

Nursing Actions

Ask Ms. Adams if her mobility has improved postoperatively. Observe patient transfer from bed to chair.

Patient Response and Finding

Patient is able to transfer from the chair to the bed with assistance.

Achievement of Outcome

Patient has achieved goal of transferring with assistance.

Observe Ms. Adams's skin integrity at each shift.

Patient's wound remains clean, dry, and intact. No breakdown is noted on extremities.

Patient has achieved outcome that skin will remain intact.

Perform circulatory assessment of extremities at every shift.

Patient's calf diameters remain within 1 cm of baseline. Swelling, pain, redness, and warmth are not evident.

DVT is not evident.

Ask Ms. Adams to rate her fear of falling on a scale of 0 to 10.

Patient rates fear of falling a 7 on a scale of 0 to 10.

Outcome of decrease in fear of falling has not been totally achieved.

Patient is getting out of bed every shift.

Continue to encourage patient.

- Patient's skin colour and temperature return to normal baseline within 20 minutes of position change.
- Patient's skin remains dry and intact.

Setting Priorities

In developing a care plan, it is important to set priorities so that immediate needs are attended to first. This is particularly important when patients have multiple diagnoses (Figure 45-11). Plan therapies according to the severity of risks to the patient. Individualize the plan according to the patient's developmental stage, level of health, and lifestyle. The immediacy of any problem is determined by the effect the problem has on the patient's mental and physical health.

Potential complications should not be overlooked. Many times, actual problems such as pressure ulcers and disuse osteoporosis get addressed only after they develop. Therefore,

you must be vigilant in monitoring the patient, reinforcing prevention techniques to both the patient and other caregivers, and supervising unregulated care providers (UCPs) in carrying out activities aimed at preventing complications of impaired mobility.

Continuity of Care

The interventions planned for the patient may be done directly by the nurse or delegated to UCPs. UCPs can reinforce leg exercises, use of the incentive spirometer, and coughing and deep breathing (see Chapter 38). They may also turn and position patients, apply elastic stockings, and assess leg circumferences and height and weight.

Because many of the skills associated with care of the patient who is immobile can be delegated, you need to be vigilant in performing routine assessments to identify any

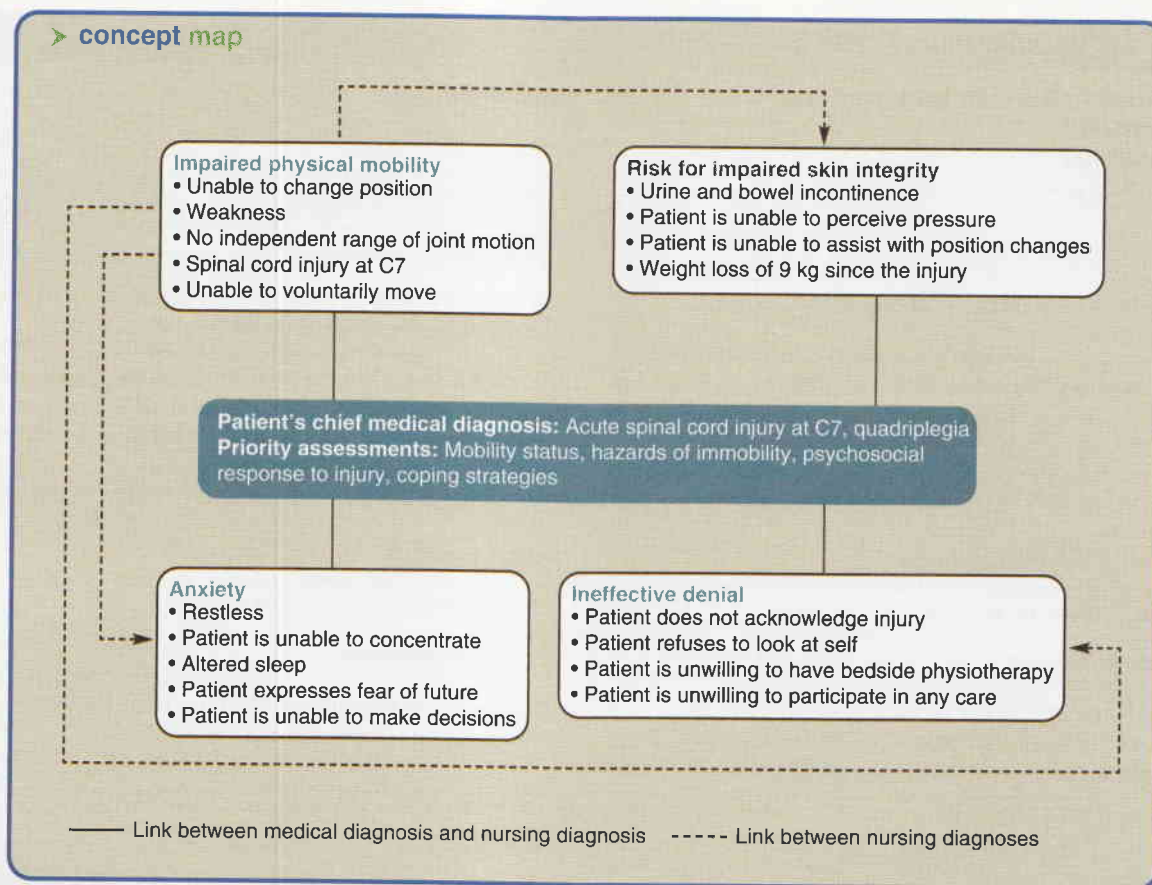


Figure 45-11 Concept map for patient with quadriplegia related to an acute spinal cord injury at C7.

developing complications early. It is also your responsibility to inform the UCP when patients are at risk for immobility hazards so that complications can be prevented. For example, although turning and positioning of a patient who is comatose may be delegated, you must ensure that it is done correctly and that the position is changed frequently enough to reduce the risk of poor alignment and future injury to the skin and musculoskeletal system. The frequency of turning is based on patient assessment for risk of pressure ulcer development (see Chapter 46).

Collaborate with other health team members such as physiotherapists or occupational therapists when considering a patient's mobility needs. For example, physiotherapists are a resource for planning ROM or strengthening exercises, and occupational therapists are a resource for planning ADLs that patients need to modify or relearn. Discharge planning begins when a patient enters the health care system. Consideration must be given to the patient's home environment when setting goals and planning therapies to maintain or improve body alignment and mobility. Referrals should be made early in the care process for ongoing care and therapy at home to help the patient remain mobile or further regain mobility at home.

❖ Implementation

Health Promotion

Health promotion activities are an essential part of primary health care and include a variety of interventions that can be divided into education, prevention, and early detection.

Encouragement of exercise should be a key health promotion strategy for all individuals, regardless of mobility issues (see Chapter 35). Engaging in regular exercise maintains the health of bones, muscles, and joints, thus promoting mobility.

Health promotion for the nurse includes additional areas of attention. Nurses must advocate for a healthy work environment for themselves and their patients. The availability of safe patient-handling equipment, the existence of transfer and lift policies, and staff education are just some of the key features of a healthy work environment (see Chapter 35).

Acute Care

In the acute care setting, use interventions to reduce the hazards of immobility. You should also know proper positioning and transferring techniques to safely move patients (see Chapter 35).

Immobility Hazards. Patients in acute care settings may demonstrate some problems associated with prolonged immobility, such as impaired respiratory status, orthostatic hypotension, and impaired skin integrity. For these patients, nursing interventions are designed to reduce the impact of immobility on body systems and prepare the patient for the restorative phase of care.

Metabolic System. Patients who are immobile often require a high-protein, high-calorie diet and possibly vitamin C and zinc supplements. Protein is needed to repair injured tissue and rebuild depleted protein stores. A high-calorie intake provides sufficient fuel to meet metabolic needs and to replace subcutaneous tissue. Supplementation with vitamin C

and zinc, if zinc stores are low, is needed for skin integrity and wound healing (see Chapter 46).

If the patient is unable to eat, nutrition must be provided parenterally or enterally. Enteral feedings include delivery through a nasogastric, gastrostomy, or jejunostomy tube of high-protein, high-calorie solutions with complete requirements of vitamins, minerals, and electrolytes (see Chapter 42). Total parenteral nutrition refers to delivery of nutritional supplements through a central or peripheral intravenous catheter.

Respiratory System. Nursing interventions for the respiratory system are aimed at promoting expansion of the chest and lungs, preventing stasis of pulmonary secretions, maintaining a patent airway, and promoting adequate exchange of respiratory gases.

Promoting Expansion of the Chest and Lungs. Changing the position of the patient at least every two hours allows the dependent lung regions to re-expand. Re-expansion maintains the elastic recoil property of the lungs and clears the dependent lung regions of pulmonary secretions.

Encourage the patient to deep breathe and cough every one to two hours. Alert patients can be taught to deep breathe or yawn every hour or to use an incentive spirometer (see Chapter 38). Instruct the patient to take in three deep breaths and cough with the third exhalation. This technique produces a more forceful, productive cough without excessive fatigue. These respiratory interventions will aid alveolar expansion and prevent atelectasis. Coughing reduces the stasis of pulmonary secretions.

If abdominal binders are required, they should be removed every two hours to allow the patient to breathe deeply. Binders must be assessed for correct positioning and adjusted as necessary to prevent interference with respirations. Often, patients will wear the binder only when ambulating. Specific physician instructions for the use of binders will vary.

Preventing Stasis of Pulmonary Secretions. Stagnant secretions accumulating in the bronchi and lungs may lead to growth of bacteria and subsequent development of pneumonia. Changing the patient's position every two hours can reduce stagnation of secretions. This change rotates the dependent lung, mobilizing secretions.

The patient who is immobile should take in a minimum of 2000 mL of fluid a day, if not contraindicated, to help keep mucociliary clearance normal. In patients free from infection and with adequate hydration, pulmonary secretions will appear thin, watery, and clear. The patient can easily remove the secretions by coughing. Without adequate hydration, the secretions are thick and difficult to remove. Encouragement of fluid intake also benefits bowel and urine elimination and aids in maintaining circulation and skin integrity.

Chest physiotherapy (CPT) (percussion and positioning) is an effective method for preventing pulmonary secretion stasis. CPT techniques help the patient to drain secretions from specific segments of the bronchi and lungs into the trachea so that the patient can cough and expel the secretions. Respiratory assessment findings can be used to identify areas of the lungs requiring CPT (see Chapter 38).

Maintaining a Patent Airway. Patients who are immobilized are generally weakened. If weakness progresses, the cough reflex gradually becomes inefficient. The stasis of secretions in the lungs may be life-threatening because hypostatic pneumonia can easily develop. The dislodging and mobilizing of the stagnant secretions reduce the risk of pneumonia. Assessment findings that indicate this condition include

productive cough with greenish-yellow sputum; fever; pain on breathing; crackles and wheezes; and dyspnea. You should actively work with the patient to deep breathe and cough every one to two hours as described earlier, in the section "Promoting Expansion of the Chest and Lungs."

In the patient who is immobilized, an obstructed airway is usually the result of a mucous plug. You can implement several therapies (e.g., CPT) to reduce the risk of mucous plugs and to maintain a patent airway. Nasotracheal or orotracheal suction techniques may be used to remove secretions in the upper airways of a patient who is unable to cough productively. This procedure must be performed aseptically. You can also suction secretions when patients have artificial airways such as an endotracheal or tracheal tube. Insert a catheter into the artificial airway using sterile technique. This can be used to remove pulmonary secretions from the upper and lower airways (see Chapter 38).

Cardiovascular System. The effects of bed rest or immobilization on the cardiovascular system include orthostatic hypotension, increased cardiac workload, and thrombus formation. Nursing therapies are designed to minimize or prevent these alterations.

Reducing Orthostatic Hypotension. After bed rest, patients usually have increased pulse rate and decreased pulse pressure and blood pressure. A large decrease in blood pressure when rising to a sitting or standing position (orthostatic hypotension) can result in lightheadedness and fainting (Copstead-Kirkhorn & Banasik, 2011). When getting a patient up for the first time, you should be assisted by at least one other person. This is a precautionary step in case the patient faints.

Interventions should be directed toward reducing or eliminating the effects of orthostatic hypotension. Attempt to get the patient moving as soon as the physical condition allows, even if this only involves sitting at the side of the bed (dangling) or moving to a chair. Changing position slowly and gradually helps to prevent orthostatic hypotension. Before the patient gets up from the bed, slowly raise the head of the bed so that the patient is sitting up for about 10 minutes before standing. Then, help the patient to sit on the side of the bed for a few minutes before the patient stands up. This activity helps maintain muscle tone and increase venous return. Then help the patient to stand. It is important to ask the patient if he or she feels weak or dizzy or sees spots before the eyes. If any of these symptoms occur, help the patient sit down again.

Reducing Cardiac Workload. Cardiac workload is increased by immobility. A primary intervention is to discourage patients from holding their breath while bearing down (the Valsalva manoeuvre), as may occur when the patient is moving up in bed or straining to defecate. The Valsalva manoeuvre increases intrathoracic pressure, thus decreasing venous return and cardiac output. When the strain is released, venous return and cardiac output immediately increase and systolic blood pressure and pulse pressure rise. These pressure changes produce a reflex bradycardia and a possible decrease in blood pressure that may cause sudden cardiac death in patients with heart disease. Remind the patient to breathe out while moving or being lifted up in bed.

Preventing Thrombus Formation. The most cost-effective way to address the problem of deep vein thrombosis (DVT) is through prevention (prophylaxis). It begins with identifying patients at risk and continues throughout the time patients are immobile or otherwise at risk. This is clearly a collaboration between nurses and physicians. You can easily identify risk

factors during an admission nursing assessment. Many interventions reduce the risk of thrombus formation in the patients who are immobilized. Leg exercises, encouragement of fluids, position changes, and teaching of such preventive measures should begin when the patient becomes immobile. Preoperative patients should be given this information before surgery (see Chapter 48). Other interventions such as intermittent pneumatic compression (IPC) and sequential compression devices (SCDs) require a physician's order. Maintenance and administration of prophylaxis is a nursing role, and nurses can determine when the patient is fully mobile postoperatively, decreasing the continued risk for DVT.

Medications also require a physician's order. Subcutaneous heparin and low-molecular-weight heparin (LMWH), such as tinzaparin, enoxaparin, and dalteparin, are the most widely used drugs in the prophylaxis of DVT. The recent approval of rivaroxaban and dabigatran, in addition to the long-standing availability of warfarin, means more oral options for DVT prophylaxis and anticoagulation therapy. Heparin is considered the gold standard for treatment because it has been well studied and validated. Common dosage for heparin therapy is 5000 units given subcutaneously every 12 hours until the patient is fully mobile or discharged (Geerts et al., 2008). Anticoagulants suppress clot formation and thus you must continually assess the patient for signs of bleeding, such as increased bruising, guaiac-positive stools, and bleeding gums. Although most patients receiving prophylactic doses of anticoagulants do not experience side effects, the risk of bleeding is present.

SCDs and IPCs consist of sleeves or stockings made of fabric or plastic that are wrapped around the leg and secured with Velcro (Box 45-7). The sleeves are then connected to a pump that alternately inflates and deflates the stocking around the leg. A typical cycle is inflation for 10 to 15 seconds and deflation for 45 to 60 seconds. Inflation pressures average 40 mm Hg. Use of SCDs or IPCs on the legs decreases venous stasis by increasing venous return through the deep veins of the legs. For optimal results, use of SCDs or IPCs is begun as soon as possible and maintained until the patient becomes fully ambulatory. Graduated compression stockings can help prevent DVT, but patients must receive the right size, and the SCD or IPC must be used correctly.

Elastic stockings (sometimes called *thromboembolic device [TED] hose* or thigh-high antiembolic stockings) also aid in maintaining external pressure on the muscles of the lower extremities and thus may promote venous return (Box 45-8). When considering applying elastic stockings, first assess the patient's suitability for wearing them. The stockings should not be applied if any local condition affects the leg (e.g., any skin lesion, gangrenous condition, or recent vein ligation) because application may compromise circulation. You will need to measure the patient's legs with a tape measure to determine proper stocking size. The stockings must be applied properly, and they must be removed and reapplied at least once per shift. Assess circulation at the toes to ensure that the hose are not too tight. In addition, the stockings should always be clean and dry; it may be useful for the patient to have two pairs.

Positioning techniques aid in reducing compression of the leg veins. Proper positioning used with other therapies (e.g., heparin or elastic stockings) aids in reducing the patient's risk of thrombus formation. When positioning patients, use caution to prevent pressure on the posterior knee and deep veins in the lower extremities. Patient teaching should include avoiding

► BOX 45-7 Procedural Guideline



Application of Sequential Compression Stockings

Delegation Considerations:

The skill of applying sequential compression stockings (SCSs) can be delegated to unregulated care providers (UCPs). The nurse is responsible for assessing circulation in the extremities; therefore, when application of the SCSs is delegated, it is important to instruct the UCP to do the following:

- Notify the nurse if the patient complains of pain in the leg.
- Notify the nurse if discoloration develops in the extremities.

Equipment:

Tape measure, sequential compression stockings, stockinette, hygiene supplies

Procedure:

1. Assess the patient for the need for sequential compression stockings.
2. Obtain baseline assessment data about the status of circulation, pulse, and skin integrity on the patient's lower extremities before initiating application of sequential compression stockings.
3. Measure the patient for proper-size stocking by measuring around the largest part of the patient's thigh. Review the manufacturer's directions regarding measuring for proper fit.
4. Perform hand hygiene. Provide hygiene to lower extremities if needed.
5. Place a protective stockinette over the patient's leg.
6. Wrap the stocking around the leg, starting at the ankle, with the opening over the patella (see Step 6 illustration).
 - A. Attach the stockings to the insufflator and verify that the intermittent pressure is between 35 and 45 mm Hg.



Step 6 Application of sequential compression stocking.

7. Record date and time of stocking application, and stocking length and size in nurses' notes.
8. Record condition of skin and circulatory assessment.
9. Monitor skin integrity and circulation to the patient's lower extremities as ordered or according to the manufacturer's guidelines.

crossing the legs, not sitting for prolonged periods of time, not wearing clothing that constricts the legs or waist, not putting pillows under the knees, and avoiding massaging the legs.

Although ROM exercises are designed to reduce the risk of contractures, they may also aid in preventing thrombi. Activity causes contraction of the skeletal muscles, which in turn exerts pressure on the veins to promote venous return, thereby reducing venous stasis. Specific exercises that help prevent thrombophlebitis are ankle pumps, foot circles, and knee flexion.

► BOX 45-8 Procedural Guideline

Application of Elastic Stockings

Delegation Considerations:

The skill of applying elastic stockings can be performed by unregulated care providers (UCPs). The nurse is responsible for assessing circulation to the lower extremities; therefore, when application of the stockings is delegated, it is important to instruct the UCP to report if the patient develops leg pain or discoloration.

Equipment:

Tape measure, elastic stockings, hygiene supplies

Procedure:

1. Assess the need for elastic stockings and condition of the patient's skin.
2. Observe for conditions that might contraindicate use of stockings.
3. Perform hand hygiene. Provide hygiene to lower extremities if needed.
4. Use tape measure to measure the patient's legs to determine proper stocking size (measure according to manufacturer's directions). Elastic stockings come in two lengths: knee length and thigh length.
5. Apply stockings:
 - A. Turn elastic stocking inside out up to the heel. Place one hand into the sock, holding heel. Pull top of sock with the other hand inside out over foot of sock.
 - B. Place patient's toes into the foot of the elastic stocking, making sure that sock is smooth (see Step 5B illustration).



Step 5B

- C. Slide remaining portion of sock over the patient's foot, being sure that the toes are covered. Make sure the foot fits into the toe and heel position of the sock (see Step 5C illustration).



Step 5C

- D. Slide top of sock up over patient's calf until sock is completely extended. Be sure sock is smooth and no ridges or wrinkles are present, particularly behind the knee (see Step 5D illustration).



Step 5D

6. Instruct patient not to roll socks partially down.
7. Record date and time of stocking application, and stocking length and size in nurses' notes.
8. Record condition of skin and circulatory assessment.

Ankle pumps, sometimes called *calf pumps*, include alternating plantar flexion and dorsiflexion. To perform foot circles, the patient rotates the ankle. Making the letters of the alphabet with their feet every one to two hours is a good exercise for patients. Knee flexion involves alternately extending and flexing the knee. These exercises are sometimes referred to as antiembolic exercises and should be done hourly while the patient is awake.

When DVT is suspected, you should report it immediately. The leg should be elevated with no pressure on the thrombus. The family, patient, and all health care personnel should be instructed to not massage the area because of the danger of dislodging the thrombus.

Musculoskeletal System. The patient who is immobilized must receive some exercise to prevent or minimize muscle atrophy and joint contractures. If the patient is unable to move part or all of the body, perform passive ROM exercises for all immobilized joints while bathing the patient and at least two or three more times a day (see "Restorative Care" section). If one extremity is paralyzed, the patient can be taught to put each joint independently through its ROM. Patients on bed rest should have active ROM exercises incorporated into their daily

schedules. Nurses can teach patients to integrate exercises during ADLs. Some orthopedic conditions require frequent passive ROM exercises to restore the injured joint's function after surgery. Patients with such conditions may use automatic equipment (continuous passive motion [CPM]) for passive ROM exercises (Figure 45-12). The CPM machine moves an extremity to a prescribed angle for a prescribed period. This is beneficial when the patient must gradually increase the degree and duration of flexion and extension. Researchers are currently investigating new uses for CPM. In one study, patients who had suffered a cerebrovascular accident (CVA) and who received CPM therapy to their affected shoulder had better joint stability than that of patients who received traditional ROM exercises (Lynch et al., 2005).

Active ROM exercises help maintain function of the musculoskeletal system. You should also plan interventions for the gradual return of mobility for patients who will be able to resume normal activity. The best nursing intervention is establishing an individualized progressive exercise program (Shin et al., 2006). A progressive exercise program gradually increases the patient's physical activity to reverse the deconditioning associated with immobility.



Figure 45-12 Continuous passive motion machine.

Encouraging the use of isometric-type exercises will also help the patient maintain the musculoskeletal system during acute care. Review the patient's chart and collaborate with the physician to alert you to any possible contraindications before initiating isometric exercises. An isometric exercise program is designed for the specific needs of a patient. For example, to prepare the patient for walking with crutches, you may implement an exercise program that includes isometric exercises targeting the biceps and triceps. Tell the patient to stop the activity if pain, fatigue, or discomfort are experienced, and reinforce this as necessary.

Generally, in an isometric exercise the muscle group is tightened (contracted) for 10 seconds and then completely relaxed for several seconds. Repetitions are gradually increased for each muscle group until the isometric exercise can be repeated 8 to 10 times. Instruct patients to perform the exercises slowly and to increase repetitions as their physical condition improves. Muscle groups used for walking (quadriceps and gluteal) should be exercised isometrically four times per day until the patient is ambulatory (Hoeman, 2008).

Teaching, referral, and interdisciplinary collaboration are important for patients with limited mobility. Depending on the setting and resources available, you may want to refer the patient to a physiotherapist or kinesiologist. The therapist would set up the specific exercise program, and the nurse would reinforce it.

Elimination System. The nursing interventions for maintaining optimal urinary functioning are directed at keeping the patient well hydrated and preventing urinary stasis, calculi, and infections without causing bladder distension.

Adequate hydration (i.e., 2000 to 3000 mL of fluids per day) helps prevent renal calculi and urinary tract infections. The patient who is well hydrated should void large amounts of dilute urine that are approximately equal to fluid intake. If the patient is incontinent, modify the care plan to include toileting aids and a hygiene schedule so that the increased urinary output does not cause skin breakdown.

To prevent bladder distension, assess the frequency and amount of urinary output. A patient who continually dribbles urine and whose bladder is distended may have overflow incontinence. If the patient does not have voluntary control of bladder elimination, bladder training may be necessary. If the patient experiences bladder distension, you may be required to insert a straight catheter or an indwelling Foley catheter (see Chapter 43).

The frequency and consistency of bowel movements must be recorded. A diet rich in fluids, fruits, vegetables, and fibre can facilitate normal peristalsis. If a patient is unable to maintain regular bowel patterns, stool softeners, cathartics, or enemas may be needed (see Chapter 44).

Integumentary System. The major risk to the skin from restricted mobility is the formation of pressure ulcers. Preventing a pressure ulcer is much less expensive than treating one, and thus preventive nursing interventions are imperative as outlined in the RNAO (2005b) Best Practice Guideline: *Risk Assessment and Prevention of Pressure Ulcers* (see Chapter 46).

Interventions aimed at prevention are positioning, skin care, and the use of therapeutic devices to relieve pressure. The patient who has impaired mobility should be assisted or encouraged to change position according to the patient's activity level, perceptual ability, treatment protocols, and daily routines. Although turning every one to two hours is recommended for preventing ulcers, it may also be necessary to use devices for relieving pressure. The amount of time that a patient sits uninterrupted in a chair should be limited to one hour or less, although this time interval is individualized. The patient should be repositioned frequently because uninterrupted pressure will cause skin breakdown. You should teach patients who are able to do so to shift their weight every 15 minutes. Patients who are chair-bound should have a device for the chair that reduces pressure; however, doughnut-shaped devices should not be used (RNAO, 2007). If a pressure ulcer does develop, treatment should commence immediately based on RNAO's (2007) Best Practice Guideline: *Assessment and Management of Stage I–IV Pressure Ulcers* (see Chapter 46).

Psychosocial Changes. Through assessment, you can identify effects of prolonged immobilization on the patient's psychosocial dimension. People who have a tendency toward depression or mood swings are at greater risk for developing psychosocial changes during bed rest or immobilization.

You should anticipate changes in the patient's psychosocial status and provide routine and informal socialization. Nursing activities can be planned so that the patient can talk and interact with staff. If possible, the patient should be placed in a room with others who are mobile and interactive. If a private room is required, staff members and family should be asked to visit throughout the shift to provide meaningful interaction.

Provide stimuli to maintain a patient's orientation. Maintaining a calendar and clock; providing a newspaper, books, radio, or television; and encouraging visits from significant others may reduce the risk of social isolation and delirium (RNAO, 2010a). Spending time in the room talking and listening to the patient also helps reduce isolation.

An important part of nursing care for patients with mobility issues is encouraging them to perform as many ADLs as independently as possible. Patients should continue to perform personal grooming if they did so before their mobility was restricted. This type of activity preserves the patient's dignity and gives the patient a sense of accomplishment.

In institutional health care settings, nursing care given between 2200 hours and 0700 hours should be scheduled to minimize interruptions of sleep. For example, the nurse may administer medications and assess vital signs at the time when the patient is turned or receives special skin care.

Observe the patient's ability to cope with restricted mobility. If the nursing care plan is not improving coping patterns, a clinical nurse specialist, counsellor, social worker, spiritual

advisor, or other consultant may be needed. Their recommendations should be incorporated into the care plan.

Developmental Changes in Children. Ideally, patients with mobility challenges continue normal development; nursing interventions can help with this. Nursing care should provide mental and physical stimulation, particularly for a young child. Play activities can be incorporated into the care plan. Completing puzzles, for example, helps a child to develop fine motor skills, and reading helps the child to develop cognitively. Parents should be encouraged to stay with a child who is hospitalized. An immobilized child should be placed with children of the same age who are not immobilized, unless a contagious disease is present. You must watch for significant changes from normal behavioural patterns. If these changes continue, consult with a clinical nurse specialist, counsellor, or other health care provider who specializes in children.

Positioning Devices and Techniques. Patients with impaired function of the nervous, skeletal, or muscular system and with general weakness often require help to attain proper body alignment while in bed or sitting. You must assess skin integrity regularly for pressure points or skin breakdown when using positioning devices.

Several positioning devices are available for maintaining good body alignment for patients:

- **Pillows:** These provide support, elevate body parts, and can splint incisional areas, reducing postoperative pain during activity or coughing and deep breathing. Before using a pillow, you should determine whether it is the proper size. A thick pillow under the patient's head increases cervical flexion. A thin pillow under body prominences may be inadequate to protect skin and tissue from damage caused by pressure. When additional pillows are unavailable, or if they are an improper size, folded sheets, blankets, or towels can be used as positioning aids.
- **Wedge (or abductor) pillow:** This is a triangular-shaped pillow made of heavy foam used to maintain the legs in abduction after total hip replacement surgery.
- **Foot boot:** This maintains feet in dorsiflexion. Foot boots are made of rigid plastic or heavy foam (Figure 45-13). They keep the foot flexed at the proper angle and the weight of the bedsheets off the toes. Remove the foot boots two or three times a day to assess skin integrity and joint mobility.
- **Trochanter roll:** This prevents external rotation of the hips when the patient is in a supine position. A **trochanter roll**

is formed by folding a cotton bath blanket lengthwise to a width that will extend from the greater trochanter of the femur to the lower border of the popliteal space (Figure 45-14). The blanket is placed under the buttocks and then rolled counterclockwise until the thigh is in neutral position or in inward rotation. When correct alignment of the hip is achieved, the patella faces directly upward.

- **Sandbags:** These are sand-filled plastic tubes or bags that can be shaped to body contours. Sandbags can be used in place of or in addition to trochanter rolls. They immobilize an extremity or maintain body alignment.
- **Hand rolls:** These rolls maintain the thumb in slight adduction and in opposition to the fingers. A hand roll maintains the hand, thumb, and fingers in a functional position, thus preventing contractures (Figure 45-15). Evaluate the hand roll to make sure that the hand is indeed in a functional position. Hand rolls are most often used for patients whose arms are paralyzed or who are unconscious. Rolled washcloths should not be used as hand rolls, because they do not keep the thumb well abducted, especially in patients who have a spastic paralysis.
- **Hand-wrist splints:** These are individually moulded for the patient to maintain proper alignment of the thumb (slight adduction) and the wrist (slight extension). These splints should be used only by the patient for whom the splint was made (Figure 45-16).

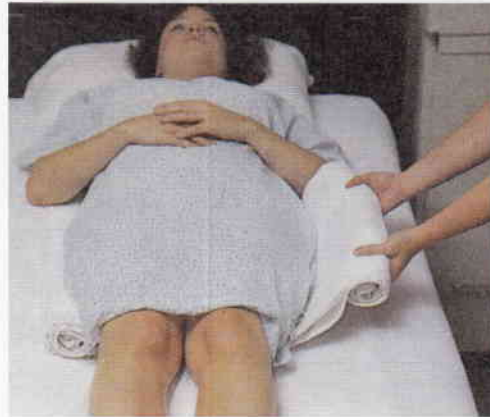


Figure 45-14 Trochanter roll.



Figure 45-13 Foot boot.



Figure 45-15 Hand roll. Source: Courtesy J. T. Posey, Arcadia, CA.



Figure 45-16 Hand-wrist splint. **Source:** Sorrentino, S. A., Wilk, M. J., & Newmaster, R. (2009). *Mosby's Canadian textbook for the support worker* (2nd ed., p. 431, Fig 24-8). Toronto: Elsevier.



Figure 45-17 Patient using a trapeze bar.

- **Trapeze bar:** This is a triangular device that descends from a securely fastened overhead bar attached to the bed frame. A **trapeze bar** allows the patient to use his or her upper extremities to raise the trunk off the bed, to assist in transfer from bed to wheelchair, or to perform arm exercises (Figure 45-17). It is a useful device for helping to increase independence, maintain upper body strength, and decrease the shearing action from sliding across or up and down in bed.

Although procedures for each position have specific guidelines, some universal steps should be followed for patients who require positioning assistance (Skill 45-1). By following the guidelines, you reduce the risk of injury to the musculoskeletal system. When joints are unsupported, their alignment is impaired. Joints must be positioned in a slightly flexed position or their mobility is decreased. During positioning, it is important to also assess bony prominences (pressure points; see Figure 46-2). When actual or potential pressure areas exist, nursing interventions involve removal of the pressure, thus

decreasing the risk for development of pressure ulcers and further trauma to the musculoskeletal system. For patients at risk for pressure ulcers, the 30-degree lateral position should be used (see Chapter 46).

Supported Fowler's Position. In the supported Fowler's position, the head of the bed is elevated 45 to 60 degrees and the patient's knees are slightly elevated without pressure; the patient is sitting up in bed. Do not elevate the head of the bed more than 60 degrees because this would increase shearing force on the patient's back and heels (see Chapter 46). The angle of head and knee elevation and the length of time that the patient should remain in the supported Fowler's position vary depending on the patient's illness and overall condition. Supports must permit flexion of the hips and knees and proper alignment of the normal curves in the cervical, thoracic, and lumbar vertebrae. The following are common trouble areas for the patient in the supported Fowler's position (see Skill 45-1 for preventive measures):

- Excessive cervical flexion because the pillow at the head is too thick and the head thrusts forward
- Hyperextension of the knees, allowing the patient to slide to the foot of the bed
- Pressure on the posterior aspect of the knees, decreasing circulation to the feet
- External rotation of the hips
- Arms hanging unsupported at the patient's sides
- Unsupported feet or pressure on the heels
- Unprotected pressure points at the sacrum and heels

Supine Position. The supine position is a back-lying position. In the supine position, the relationship of body parts is essentially the same as in good standing alignment except that the body is in the horizontal plane. Pillows, trochanter rolls, and hand rolls or arm splints are used to increase comfort and reduce injury to the skin or musculoskeletal system. The mattress should be firm enough to support the cervical, thoracic, and lumbar vertebrae. Shoulders are supported, and the elbows are slightly flexed to control shoulder rotation. A foot support is used to prevent footdrop and maintain proper alignment. The following are some common trouble areas for patients in the supine position (see Skill 45-1 for preventive measures):

- Excessive cervical flexion because the pillow at the head is too thick and the head thrusts forward
- Head flat on the mattress
- Shoulders unsupported and internally rotated
- Elbows extended
- Thumb not in opposition to the fingers
- Hips externally rotated
- Unsupported feet
- Unprotected pressure points at the occipital region of the head, vertebrae, coccyx, elbows, and heels

Prone Position. The patient in the prone position is lying chest down. Often the head is turned to the side. If a pillow is under the head, it should be thin enough to prevent cervical flexion or extension and maintain alignment of the lumbar spine. Placing a pillow under the lower leg permits dorsiflexion of the ankles and some knee flexion, which promotes relaxation. If a pillow is unavailable, the ankles should be in dorsiflexion over the end of the mattress. Although the prone position is seldom used in practice, nurses should consider this as an alternative, especially in patients who normally sleep in this position. The prone position may also have some

Text continued on p. 1230

► SKILL 45-1 Moving and Positioning Patients in Bed



Delegation Considerations

The skills of moving and positioning patients in bed can be delegated to unregulated care providers (UCPs). The nurse is responsible for assessing the patient's level of comfort and for any potential hazards. It is important to instruct the UCP on any limitations affecting movement and positioning of the patient in bed.

Procedure

STEPS

1. Assess patient's body alignment and comfort level while patient is lying down.
2. Assess for risk factors that may contribute to complications of immobility:
 - A. Paralysis: Hemiparesis resulting from cerebrovascular accident; decreased sensation
 - B. Impaired mobility: Traction or arthritis or other contributing disease processes
 - C. Impaired circulation
 - D. Age: Very young, older adults
- E. Level of consciousness and mental status
- F. Assess condition of patient's skin.
3. Assess patient's physical ability to help with moving and positioning:
 - A. Age
 - B. Level of consciousness and mental status
 - C. Disease process
 - D. Strength, coordination
 - E. ROM
4. Assess physician's orders. Clarify whether any positions are contraindicated because of the patient's condition (e.g., spinal cord injury; respiratory difficulties; certain neurological conditions; presence of incisions, drain, or tubing).
5. Perform hand hygiene.
6. Assess for the presence of tubes, incisions, and equipment (e.g., traction).
7. Assess the ability and motivation of the patient, family members, and primary caregiver to participate in moving and positioning the patient in bed in anticipation of discharge to home.
8. Raise level of bed to a comfortable working height, and get extra help if needed.
9. Perform hand hygiene.
10. Explain procedure to patient.
11. Position patient flat in bed if this is tolerated.

Equipment

- Pillows
- Drawsheet or friction-reducing device
- Positioning devices as required (e.g., trochanter roll, extra pillows, hand rolls)

RATIONALE

- Provides baseline data for later comparisons. Determines ways to improve position and alignment.
- Increased risk factors require patient to be repositioned more frequently.
- Paralysis impairs movement and causes muscle tone changes; sensation can be affected. Because of difficulty in moving and poor awareness of the involved body part, the patient is unable to protect and position the affected body part.
- Traction or arthritic changes of affected extremity result in decreased range of motion (ROM).
- Decreased circulation predisposes the patient to pressure sores.
- Premature and young infants require frequent turning because their skin is fragile. Normal physiological changes associated with aging predispose older adults to greater risks for developing complications of immobility.
- Patients who are comatose or semicomatose are unable to convey areas of skin pressure, increasing the risk for skin breakdown.
- Provides a baseline to determine effects of positioning.
- Enables nurse to use patient's mobility and strength. Determines need for additional help. Ensures patient's and nurse's safety.
- Older adult patients may move more slowly and with less strength.
- Determines need for special aids or devices.
- Patients with altered levels of consciousness may not understand instructions and may be unable to help.
- Cardiopulmonary disease may require the patient to have the head of the bed elevated.
- Determines amount of assistance provided by patient during position change.
- Limited ROM may contraindicate certain positions.
- Placing patient in an inappropriate position could cause injury.
- Reduces transfer of microorganisms.
- Will alter positioning procedure and may affect patient's ability to independently change positions.
- Determines ability of the patient and caregivers to assist with positioning.
- Raises level of work to centre of gravity and provides for patient's and nurse's safety.
- Reduces transfer of microorganisms.
- Decreases anxiety and increases patient cooperation.
- Repositioning from a flat position decreases friction and possible shear on patient's skin.

Critical Decision Point: Before flattening the bed, account for all tubing, drains, and equipment to prevent dislodgement or tipping if caught in the mattress or bed frame as bed is lowered.

Continued

► SKILL 45-1 Moving and Positioning Patients in Bed-cont'd



12. Position patient in bed.

A. Assist patient in moving up in bed (one or two nurses). Note: Only a young child or a small patient requiring minimal assistance can be safely moved by one nurse.

(1) Remove pillow from under the head and shoulders, and place pillow at head of bed. Ask patient to cross arms across the chest.

(2) Face head of bed.

(a) Each nurse should have one arm under the patient's shoulders and one arm under the patient's thighs.

(b) Alternative position: Position one nurse at the patient's upper body. The nurse's arm nearest head of bed should be under the patient's head and opposite shoulder; the other arm should be under the patient's closest arm and shoulder. Position the other nurse at patient's lower torso. The nurse's arms should be under the patient's lower back and torso.

(3) Place feet apart, with foot nearest head of bed behind the other foot (forward-backward stance; see Step 12A(3) illustration).



Step 12A(3) Position of feet: feet placed apart in a forward-to-backward stance.

(4) Ask patient to flex knees with feet flat on bed.

(5) Instruct patient to flex neck, tilting chin toward chest.

(6) Instruct patient to assist moving by pushing with feet on bed surface.

(7) Flex knees and hips, bringing forearms closer to the level of the bed.

(8) Instruct patient to push with heels and elevate trunk while breathing out, thus moving toward head of bed on a count of 3.

(9) On count of 3, rock and shift weight from back to front leg. At the same time, the patient pushes with heels and elevates trunk.

B. Move patient up in bed with drawsheet or friction-reducing device (two nurses are needed).

(1) Adjust bed to appropriate height for caregiver's body mechanics. Place drawsheet or friction-reducing device under the patient by turning side to side. Have sheet extend from shoulders to thighs. Return patient to supine position.

(2) Position one nurse at each side of the patient.

(3) Grasp drawsheet or friction-reducing device firmly near the patient with palms facing up.

- Prevents striking of patient's head against head of the bed.
- Reduces surface area and friction.

- Facing the direction of movement prevents twisting of nurse's body while moving the patient.

- Prevents trauma to patient's musculoskeletal system by supporting shoulder and hip joints and evenly distributing weight.

- A wide base of support increases balance. This stance enables you to shift body weight as the patient is moved up in bed, thereby reducing force needed to move load.

- Decreases friction and enables patient to use leg muscles during movement.
- Prevents hyperextension of neck when moving patient up in bed.
- Reduces friction. Increases patient mobility. Decreases workload.
- Increases balance and strength by bringing the centre of gravity closer to the patient. Uses thighs instead of back muscles.
- Prepares patient for move. Reinforces assistance in moving up in bed. Increases patient cooperation. Breathing out avoids Valsalva manoeuvre.
- Rocking enables you to improve balance and overcome inertia. Shifting weight counteracts the patient's weight and reduces the force needed to move load. The patient's assistance reduces friction and workload.

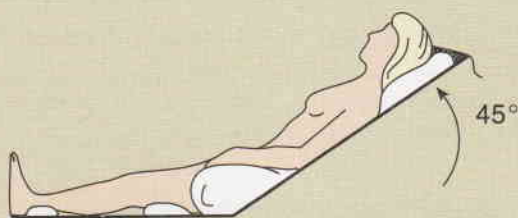
- Supports patient's body weight and reduces friction during movement. Reduces risk of injury to caregivers and maximizes leverage to move the patient safely.

- Distributes weight equally between nurses.

► SKILL 45-1 Moving and Positioning Patients in Bed—cont'd



- (4) Place feet apart with forward-backward stance. Flex knees and hips. Shift weight from back to front leg, and move patient and drawsheet or friction-reducing device to desired position in bed.
 - (5) Realign patient in correct body alignment.
- C. Position patient in supported Fowler's position (see Step 12C illustration).



Step 12C Supported Fowler's position.

- (1) Elevate head of bed 45 to 60 degrees.
 - (2) Rest patient's head against mattress or on a small pillow.
 - (3) Use pillows to support arms and hands if the patient does not have voluntary control or use of hands and arms.
 - (4) Position pillow at lower back.
 - (5) Place a small pillow under thigh.
 - (6) Position patient's heel in heel boots or other heel pressure relief devices.
- Facing the direction of movement ensures proper balance. Shifting weight reduces the force needed to move load. Flexing knees lowers the centre of gravity and uses thighs instead of back muscles.
 - Prevents injury to musculoskeletal system.
 - Increases comfort, improves ventilation, and increases patient's opportunity to socialize or relax.
 - Prevents flexion contractures of cervical vertebrae.
 - Prevents shoulder subluxation from effect of downward pull of unsupported arms, promotes circulation by preventing venous pooling, and prevents flexion contractures of arms and wrists.
 - Supports lumbar vertebrae and decreases flexion of vertebrae.
 - Prevents hyperextension of knee and occlusion of popliteal artery caused by pressure from body weight.
 - Heel pressure relief devices are more effective than pillows for consistently reducing pressure from the mattress on the heels. When pillows are used, they must be repositioned each time the patient moves.

Critical Decision Point: A foot cradle may also be used in patients with poor peripheral circulation as a means of reducing pressure on the tips of a patient's toes.

D. Position patient with hemiplegia in supported Fowler's position.

- (1) Elevate head of bed 45 to 60 degrees.
 - (2) Position patient in sitting position as straight as possible.
 - (3) Position head on a small pillow with the chin slightly forward. If patient is totally unable to control head movement, hyperextension of the neck must be avoided.
- Increases comfort, improves ventilation, and increases patient's opportunity to relax.
 - Counteracts tendency to slump toward affected side. Improves ventilation and cardiac output, and decreases intracranial pressure. Improves patient's ability to swallow and helps to prevent aspiration of food, liquids, and gastric secretions.
 - Prevents hyperextension of neck. Too many pillows under the head may cause or worsen neck flexion contracture.

Critical Decision Point: If the patient has a paralyzed extremity, provide support for involved arm and hand on overbed table in front of patient. Place arm away from the patient's side and support elbow with pillow.

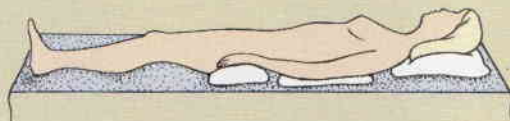
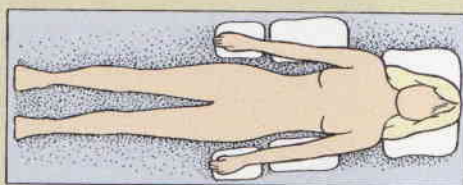
- Position *flaccid* hand in a normal resting position with the wrist slightly extended, arches of hand maintained, and fingers partially flexed. You may use a hand grip or section of rubber ball cut in half; clasp patient's hands together.
 - Position *spastic* hand with wrist in neutral position or slightly extended; fingers should be extended with palm down. It may be difficult to position spastic hands without the use of specially made splints for the patient (discuss with occupational therapist).
 - (4) Flex patient's knees and hips by using a pillow or folded blanket under the knees.
 - (5) Support feet in dorsiflexion with firm pillow or therapeutic boots or splints.
 - Ensures proper alignment. Flexion prevents prolonged hyperextension, which could impair joint mobility.
 - Prevents footdrop. Stimulation of ball of the foot by a hard surface has a tendency to increase muscle tone in a patient with extensor spasticity of lower extremity. Therapeutic boots or splints are manufactured with thick padding to cushion the heel and prevent pressure ulcers.
- E. Position patient in supine position.
- (1) Be sure patient is comfortable on back with head of bed flat.
 - Some patients' physical conditions will not tolerate a supine position.

Continued

► SKILL 45-1 Moving and Positioning Patients in Bed—cont'd

video

- (2) Place a small rolled towel under the lumbar area of the back.
 - (3) Place a pillow under upper shoulders, neck, or head.
 - (4) Place trochanter rolls or sandbags parallel to lateral surface of the patient's thighs.
 - (5) Place a small pillow or roll under ankle to elevate heels (see Step 12C illustration).
 - (6) Place firm pillows against bottom of patient's feet.
 - (7) Place foot boots on patient's feet, if necessary.
 - (8) Place pillows under pronated forearms, keeping upper arms parallel to patient's body (see Step 12E(8) illustrations).
- Provides support for lumbar spine.
 - Maintains correct alignment and prevents flexion contractures of cervical vertebrae.
 - Reduces external rotation of hip.
 - Reduces pressure on heels, helping to prevent pressure sores.
 - Maintains dorsiflexion and prevents footdrop.
 - Maintains feet in dorsiflexion. Prevents footdrop.
 - Reduces internal rotation of shoulder and prevents extension of elbows. Maintains correct body alignment.



Step 12E(8) Supine position with pillows in place.



- (9) Place hand rolls in patient's hands. Consider occupational therapy referral for use of hand splints, if necessary.
- F. Position hemiplegic patient in supine position.**
- (1) Place head of bed flat.
 - (2) Place folded towel or small pillow under shoulder or affected side.
 - (3) Keep affected arm away from body with elbow extended and palm up. (An alternative is to place arm out to side, with elbow bent and hand toward head of the bed.)
- Reduces extension of fingers and abduction of thumb. Maintains thumb slightly adducted and in opposition to fingers.
 - Necessary for positioning in supine position.
 - Decreases possibility of pain, joint contracture, and subluxation. Maintains mobility in muscles around shoulder to permit normal movement patterns.
 - Maintains mobility in arm, joints, and shoulder to permit normal movement patterns. (The alternative position counteracts limitation of ability of arm to rotate outward at shoulder [external rotation]. External rotation must be present to raise arm overhead without pain.)

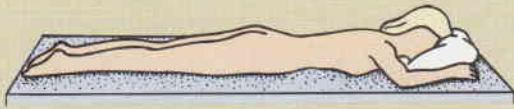
Critical Decision Point: Position the affected hand in one of the recommended positions for flaccid or spastic hand.

- (4) Place a folded towel under the hip of patient's involved side.
 - (5) Flex affected knee 30 degrees by supporting it on a pillow or folded blanket.
 - (6) Support feet with soft pillows at a right angle to leg.
- G. Position patient in prone position:** This requires two staff members to safely position patient.
- (1) With drawsheet under patient, move patient toward one side of the bed. Ensure that side rail on opposite side is up for safety. With patient supine, roll patient over arm positioned close to body, with elbow straight and hand under hip. Position on abdomen in centre of the bed.
 - (2) Turn patient's head to one side and support head with a small pillow (see Step 12G[2] illustration).
- Diminishes effect of spasticity in entire leg by controlling hip position.
 - Slight flexion breaks up abnormal extension pattern of leg. Extensor spasticity is most severe when the patient is supine.
 - Maintains foot in dorsiflexion and prevents footdrop. Pillows prevent stimulation to ball of foot by hard surface, which has a tendency to increase muscle tone in a patient with extensor spasticity of lower extremity.
 - Positions patient correctly so that alignment can be maintained.
 - Diminishes effects of spasticity in entire leg by controlling hip position. Slight hip flexion breaks up abnormal extension pattern of leg; extensor spasticity is most severe when the patient is supine.
 - Reduces flexion or hyperextension of cervical vertebrae.

► SKILL 45-1 Moving and Positioning Patients in Bed—cont'd

[video](#)

- (3) Place small pillow under patient's abdomen below level of diaphragm (see Step 12G[3] illustration).



Step 12G(2) Prone position, head supported with pillow.

- (4) Support arms in flexed position, level at shoulders.
- (5) Support lower legs with pillows to elevate toes (see Step 12G[5] illustration).



Step 12G(5) Prone position with pillows supporting lower legs.

H. Position patient with hemiplegia in prone position.

- Reduces pressure on breasts of some female patients and decreases hyperextension of lumbar vertebrae and strain on lower back.



Step 12G(3) Prone position, pillow under patient's abdomen and feet.

- Maintains proper body alignment. Support reduces risk of joint dislocation.
- Prevents footdrop. Reduces external rotation of hips. Reduces mattress pressure on toes.

Critical Decision Point: Increase frequency of position changes if pressure areas begin to appear, joint mobility becomes impaired or worsened, or patient complains of discomfort. Consult with physiotherapist and occupational therapist as needed. Use 30-degree lateral position (see Chapter 46) to help prevent pressure ulcers.

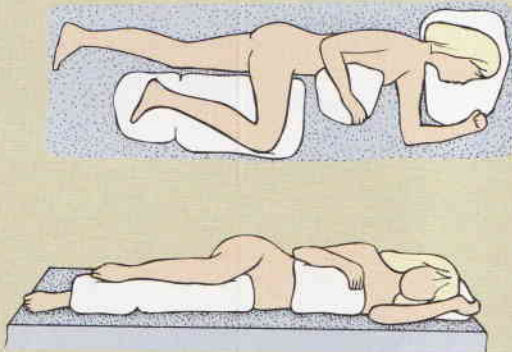
- (1) Move patient toward unaffected side.
 - (2) Roll patient onto side.
 - (3) Place pillow on patient's abdomen.
 - (4) Roll patient onto abdomen by positioning involved arm close to patient's body, with elbow straight and hand under hip. Roll patient carefully over arm.
 - (5) Turn head toward involved side.
 - (6) Position involved arm out to side, with elbow bent, hand toward head of bed, and fingers extended (if possible).
 - (7) Flex knees slightly by placing pillow under legs from knees to ankles.
 - (8) Keep feet at right angle to legs by using a pillow high enough to keep toes off mattress.
- I. Position patient in lateral (side-lying) position.
- (1) Lower head of bed completely or as low as the patient can tolerate.
 - (2) Position patient to the side of the bed.
 - (3) Prepare to turn patient onto side. Flex patient's knee that will not be next to mattress. Place one hand on the patient's hip and one hand on the patient's shoulder.
 - (4) Roll patient onto side toward you.
- Creates room for proper patient alignment in centre of bed when patient is rolled onto abdomen.
 - Prevents sagging of abdomen when patient is rolled over; decreases hyperextension of lumbar vertebrae and strain on lower back.
 - Prevents injury to affected side.
 - Promotes development of neck and trunk extension, which is necessary for standing and walking.
 - Counteracts limitation of the arm's ability to rotate outward at the shoulder (external rotation). External rotation must be present to raise arm over head without pain.
 - Flexion prevents prolonged hyperextension, which could impair joint mobility.
 - Maintains feet in dorsiflexion.
 - Provides position of comfort for patient and removes pressure from bony prominences on back and buttocks.
 - Provides room for patient to turn to side.
 - Positioning will set up leverage for easy turning.
 - Rolling patient toward nurse decreases trauma to tissues. In addition, patient is positioned so that leverage on hip makes turning easy.

Continued

► SKILL 45-1 Moving and Positioning Patients in Bed—cont'd

video

- (5) Place pillow under patient's head and neck.
 - (6) Bring shoulder blade forward.
 - (7) Position both arms in a slightly flexed position. The upper arm is supported by a pillow level with the shoulder; the other arm, by the mattress.
 - (8) Place tuck-back pillow behind patient's back. (Make by folding pillow lengthwise. The smooth area is slightly tucked under the patient's back.)
 - (9) Place pillow under semiflexed upper leg level at hip from groin to foot (see Step 12I[9] illustrations).
- Maintains alignment. Reduces lateral neck flexion. Decreases strain on sternocleidomastoid muscle.
 - Prevents patient's weight from resting directly on shoulder joint.
 - Decreases internal rotation and adduction of the shoulder. Supports both arms in a slightly flexed position.
 - Provides support to maintain patient on side.
 - Maintains leg in correct alignment. Prevents pressure on bony prominence.



Step 12I(9) Side-lying position with pillows in place.



- (10) Place sandbag parallel to plantar surface of dependent foot.
- J. Position patient in Sims' (semiprone) position.**
- (1) Lower head of bed completely.
 - (2) Be sure patient is comfortable in supine position.
 - (3) Position patient in lateral position, with dependent arm straight along the patient's body and with patient lying partially on abdomen.
 - (4) Carefully lift patient's dependent shoulder and bring arm back behind the patient.
 - (5) Place a small pillow under patient's head.
 - (6) Place pillow under flexed upper arm, supporting arm level with shoulder.
 - (7) Place pillow under flexed upper leg, supporting leg level with hip.
 - (8) Place sandbags or pillows parallel to plantar surface of foot (see Step 12J[8] illustration).
- Maintains dorsiflexion of foot. Prevents footdrop.
 - Provides for proper body alignment while patient is lying down.
 - Prepares patient for position. Patient is rolled partially onto abdomen.
 - Maintains proper alignment and prevents lateral neck flexion. Prevents internal rotation of shoulder. Maintains alignment.
 - Prevents internal rotation of hip and adduction of leg. Flexion prevents hyperextension of leg. Reduces mattress pressure on knees and ankles.
 - Maintains foot in dorsiflexion. Prevents footdrop.



Step 12J(8) Sims' (semiprone) position with pillows in place.

K. Logroll the patient (this requires three nurses).

Critical Decision Point: Supervise and aid UCPs when a physician's order is to logroll a patient. Patients who have suffered from spinal cord injury or are recovering from neck, back, or spinal surgery often need to keep the spinal column in straight alignment to prevent further injury.

- (1) Place pillow between patient's knees.
 - (2) Cross patient's arms on chest.
- Prevents tension on the spinal column and adduction of the hip.
 - Prevents injury to arms.

► SKILL 45-1 Moving and Positioning Patients in Bed—cont'd



- (3) Position two nurses on side of bed to which the patient will be turned. Position third nurse on the other side of bed (see Step 12K[3] illustration).
- (4) Fanfold or roll the drawsheet or pull sheet.
- (5) Move the patient as one unit in a smooth, continuous motion on the count of 3 (see Step 12K[5] illustration).



Step 12K(3) Position nurses on each side of patient.

- (6) The nurse on the opposite side of the bed places pillows along the length of the patient (see Step 12K[6] illustration).
- (7) Gently lean the patient as a unit back toward the pillows for support (see Step 12K[7] illustration).



Step 12K(6) Place pillows along patient's back for support.

13. Perform hand hygiene.
14. Evaluate patient's level of comfort and ability to assist in position change.
15. After each position change, evaluate patient's body alignment and presence of any pressure areas. Observe for areas of erythema or breakdown involving skin.

Unexpected Outcomes

Joint contractures

Skin erythema and breakdown

Patient avoids moving

Recording and Reporting

- Record procedure and observations (e.g., condition of skin, joint movement, patient's ability to assist with positioning).
- Report observations at change of shift and document in nurses' notes.

Home Care Considerations

- Teach the family about the importance of body mechanics for themselves and the patient.
- Teach the patient and family about the signs of skin breakdown and the importance of safety during positioning patients with decreased sensation or mobility.

- Distributes weight equally among nurses.
- Provides strong handles to grip the drawsheet or pull sheet without slipping.
- Maintains proper alignment by moving all body parts at the same time, preventing tension or twisting of the spinal column.



Step 12K(5) Move patient as a unit, maintaining proper alignment.

- Pillows keep the patient aligned.
- Ensures continued straight alignment of spinal column, preventing injury.



Step 12K(7) Gently lean patient as a unit against pillows.

- Reduces transmission of microorganisms.
- Patients with reduced activity tolerance and increased levels of pain may find position changes very tiring and will need post-position change interventions to restore their level of comfort.
- Prompt identification of poor alignment reduces risks to the patient's skin and musculoskeletal systems.

Related Interventions

- Improper positioning results in shortening of muscles.
- Frequency of repositioning is inadequate.
- Place turning schedule above patient's bed.
- Frequency of repositioning is inadequate.
- Place turning schedule above patient's bed.

benefits for patients with acute respiratory distress syndrome and acute lung injury (Marklew, 2006).

Assess for and correct any of the following potential trouble points for patients in the prone position (see Skill 45-1 for preventive measures):

- Neck hyperextension
- Hyperextension of the lumbar spine
- Plantar flexion of the ankles
- Unprotected pressure points at the chin, elbows, hips, knees, and toes

Side-Lying Position. In the side-lying (or lateral) position, the patient is resting on the side with the major portion of body weight on the dependent hip and shoulder. A 30-degree lateral position is recommended for patients at risk for pressure ulcers (see Chapter 46). Trunk alignment should be the same as in standing. For example, the structural curves of the spine should be maintained, the head should be supported in line with the midline of the trunk, and rotation of the spine should be avoided. The following trouble points are common in the side-lying position (see Skill 45-1 for preventive measures):

- Lateral flexion of the neck
- Spinal curves out of normal alignment
- Shoulder and hip joints internally rotated, adducted, or unsupported
- Lack of support for the feet
- Lack of protection for pressure points at the ear, shoulder, anterior iliac spine, trochanter, and ankles
- Excessive lateral flexion of the spine if the patient has large hips and a pillow is not placed superior to the hips at the waist

Sims' Position. Sims' position differs from the lateral position in the distribution of the patient's weight. In Sims' position, the weight is placed on the anterior ilium, humerus, and clavicle. Trouble points common in Sims' position include the following (see Skill 45-1 for preventive measures):

- Lateral flexion of the neck
- Internal rotation, adduction, or lack of support to the shoulders and hips
- Lack of support for the feet
- Lack of protection for pressure points at the ilium, humerus, clavicle, knees, and ankles

Transfer Techniques. Nurses often provide care for patients who must be assisted to change positions, who must be moved up in bed, or who must be transferred from a bed to a chair or from a bed to a stretcher. Use of proper body mechanics will enable you to position, move, or transfer patients safely and also protect you from injury to the musculoskeletal system (see Chapter 35). Although many transfer techniques are used, the following general guidelines should be followed in any transfer procedure:

- Raise the side rail on the side of the bed opposite you to prevent the patient from falling out of bed.
- Elevate the level of the bed to a comfortable working height.
- Assess the patient's mobility and strength to determine what assistance the patient can offer during transfer.
- Determine the need for assistance from other care providers or mechanical lifts.
- Explain the procedure to the patient and describe what is expected of the patient.
- Assess for correct body alignment and pressure areas after each transfer.

safety alert Recognition of your own personal strengths and limits is crucial. Moving a patient who is completely immobilized alone is dangerous and not allowed in many agencies. If you are attempting transfer or moving techniques for the first time, you should request help to reduce the risk of injury to yourself and to the patient.

Moving Patients. Patients require various levels of assistance to move up in bed, move to the side-lying position, or sit up at the side of the bed. For example, a young, healthy woman may need only a little support as she sits at the side of the bed for the first time after childbirth, whereas an older person may need help from one or more nurses to do the same task one day after abdominal surgery.

Always enlist the patient's help to the fullest extent possible. To determine what the patient is able to do alone and how many people are needed to help move the patient in bed, you need to assess the patient to determine whether the illness contradicts exertion (e.g., cardiovascular disease).

Next, determine whether the patient comprehends what is expected. For example, a patient recently medicated for post-operative pain may be too lethargic to understand instruction. To ensure safety, two nurses would be needed to move the patient in bed. You must then determine the comfort level of the patient and evaluate personal strength and knowledge of the procedure.

Finally, determine whether the patient is too heavy or immobile for you to complete the procedure alone (see Skill 45-1). If in doubt, always request assistance from another person. Collaborate with the physiotherapist, occupational therapist, and physician to plan for mobilizing the **bariatric** patient (Box 45-9). Use of mechanical transfer devices may be warranted (Figure 45-18), and agency lifting and transferring policies must be followed (Worksafe BC, 2006).

Assessment criteria and tools have been developed to help you gather data and to assess and plan for the safe transfer of patients. An example of a patient mobility assessment form is shown in Table 45-4.

Transferring a Patient from a Bed to a Chair. Transfer of a patient from a bed to a chair by one nurse requires assistance from the patient and should not be attempted with a patient who cannot help (Skill 45-2). Explain the procedure to the patient before the transfer. Moving obstacles out of the way also prepares the environment. The chair is placed next to the bed with the chair back in the same plane as the head of the bed. Placement of the chair allows you to pivot with the patient and to transfer the patient's weight in a controlled manner.

A safe transfer is the first priority. If you are doubtful about personal strength or the patient's ability to help, you should request assistance. A **transfer belt** should be used with all patients being transferred for the first time and thereafter as deemed necessary. Use of a transfer belt (called a **gait belt** when used for walking with a patient) helps prevent caregiver back injuries and aids in the safe transfer of the patient. The belt encircles the patient's waist and has handles attached for the nurse to hold. It is applied over the patient's clothing, never over bare skin. The belt is tightened so that it is snug but does not cause discomfort or impair breathing, and the buckle is placed off-centre in the front or in the back. The buckle should not be over the spine.

The patient should sit and dangle the feet at the side of the bed for a minute before standing. The patient should then stand at the side of the bed for another minute so that he or

► BOX 45-9 Mobilizing Bariatric Patients

Several measures are used to evaluate a patient's weight status. One such measure, the body mass index (BMI), expresses the relative percentages of fat and muscle mass; weight in kilograms is divided by height in metres. The result is used as an index of obesity.

The World Health Organization uses the BMI to categorize weight status:

- BMI 25 to 29.9: grade I, moderately overweight
- BMI 30 to 39.9: grade II, severely obese
- BMI >40: grade III, massively or morbidly obese

The Canadian Medical Association has declared obesity an "epidemic" (Lau et al., 2007). A survey conducted in 2004 reported that 59% of the adult population is overweight (BMI 25 to 29.9) and 23% is obese (BMI 30 to 39.9) (Starky, 2005).

Mobilizing bariatric patients requires special considerations beyond that outlined for mobilizing most patients. Facilities need policies and procedures that describe the safe handling practices and available equipment to mobilize bariatric patients. Staff need training in the techniques and use of equipment specifically for the care of this patient population (Muir & Archer-Heese, 2008). Nurses should consult their policy manual, contact their occupational health department, or consult with their administrator for organization-specific guidelines.

One of the major considerations in mobilizing bariatric patients is to ensure that the environment is safe. Environments need to be larger than usual to accommodate the patient and the necessary equipment. Unfortunately, few care facilities are specially designed to accommodate such patients (Muir & Archer-Heese, 2009). Sometimes a bed must be blocked, allowing a two-bed space in which to care for the bariatric patient (Muir & Archer-Heese, 2008).

Another consideration is how much the bariatric patient is able to assist in the move. Specific assessment forms for the safe mobilization of the bariatric patient have been developed (Muir & Archer-Heese, 2008; Muir & Archer-Heese, 2009; Muir & Gerlach, 2003).

You will need to collaborate with team members such as the physiotherapist and occupational therapist to plan for mobilizing. You may need to use a mechanical transfer device, preferably a ceiling lift. Specially designed equipment needed for moving a bariatric patient includes a hospital gown, blood pressure cuff, wheelchair, walker, commode, bed, chair, transfer device and lift, and overbed trapeze and grab bar. An overbed trapeze and grab bars enable the patient to be more independent and to participate in mobilizing (Muir & Archer-Heese, 2009).

she can quickly sit down on it in case of dizziness or fainting (Dingle, 2003). When moving a patient from a bed to a wheelchair, both nurses must use proper body mechanics. If a patient has an immobile lower extremity from a cast or paralysis, the transfer should be toward the unaffected leg.

Transferring a Patient from a Bed to a Stretcher. To transfer a patient who is immobile from a bed to a stretcher or from a bed to another bed, use a friction-reducing device under the patient. In this technique, nurses need to be on opposite sides of the bed and holding on to the friction-reducing device. The stretcher and the bed are placed side by side so that the patient can be transferred quickly and easily using the device. As with all procedures, safety is the priority. To increase safety, the three team members need to work together, with one person assuming the leadership role.

Exercise caution when transferring a patient who has or is suspected of having spinal cord trauma. If the patient must be

moved, a transfer board should be placed under the patient to maintain spinal alignment before transferring the patient to a stretcher. The patient should be prepared for the transfer and asked to help when possible (e.g., by folding the arms over the chest). The environment should be free from obstacles, and unnecessary equipment should be removed from the bed.

Restorative Care. The goal of restorative care for the patient who is immobile is to maximize functional mobility and independence and reduce residual functional deficits such as impaired gait and decreased endurance. The focus in restorative care is on not only ADLs that relate to physical self-care but also **instrumental activities of daily living (IADLs)**. IADLs are activities that are necessary to be independent in society beyond eating, grooming, transferring, and toileting. They include such skills as shopping, preparing meals, banking, and taking medications.

Although you will use many of the interventions described in the "Health Promotion" and "Acute Care" sections, the emphasis here is on working collaboratively with patients and their significant others and with other health care providers. The goal is to enhance the patient's quality of life by helping the patient return to maximal functional ability in both ADLs and IADLs.

Intensive specialized rehabilitation such as occupational or physiotherapy is common. If the patient is in an institution, he or she will likely go to the therapy department two to three times a day. Your role is to work collaboratively with these professionals and reinforce exercises and teaching. For example, after a stroke, a patient will likely receive gait training from a physiotherapist, speech rehabilitation from a speech therapist, and training from an occupational therapist on getting dressed and preparing food. Working with allied health providers on an interdisciplinary plan of care, you can reinforce and further enhance the patient's mobilization. The therapy may not be able to restore total functional health, but it may help the patient adapt to limited mobility and related complications.

Restorative interventions are focused on the regaining of mobility. According to evidenced-informed protocols, common restorative interventions used by nurses include promotion of exercises for maintaining or regaining joint mobility and teaching of the use of assistive devices for walking (Box 45-10). Items frequently used to help a patient adapt to mobility limitations include walkers, canes, wheelchairs, and assistive devices such as raised toilet seats, reaching sticks, special silverware, and adaptive clothing with Velcro closures.

Joint Mobility. To ensure adequate joint mobility, teach the patient about ROM exercises. When the patient does not have voluntary motor control, start the patient on passive ROM exercises. Walking also increases joint mobility. Occasionally, patients need to use assistive devices such as crutches or walkers to help them walk.

Range-of-Motion Exercises. Patients with restricted mobility are unable to perform some or all ROM exercises independently. Such patients include those with limited movement in one extremity and those who are completely immobilized. Provide ROM exercises to maintain maximum joint mobility.

To ensure that patients routinely receive ROM exercises, schedule them at specific times, perhaps with another nursing activity, such as during the patient's bath. Doing so will enable you to systematically reassess mobility while improving the

Text continued on p. 1240



Figure 45-18 A1, Ensure that safety straps are secured appropriately when using a motorized lift to help a patient move to standing position. A2, Patient grasps handles as the nurse enables motorized lift. A3, Patient is in standing position with feet on the floor and is ready to ambulate to a chair with nurses' help. B1, When the patient is unable to walk, secure safety straps, and use platform of the motorized lift. B2, Patient in upright position. B3, Position patient in front of chair. B4, Explain to patient the need to hold on to the handles as motorized lift begins to lower patient into chair. B5, Guide patient into chair.

TABLE 45-4 Patient Mobility Assessment Summary Form

This assessment form helps caregivers to determine if it is appropriate to assist the patient using a physical transfer or a mechanical lift. If the answer to any of the questions on the assessment form is “no,” then a mechanical lift should be used for the safety of the patient and caregivers. After determining whether the type of assistance is a physical transfer or mechanical lift, you must decide which type of transfer is most appropriate (see Skill 45-2).

Question	If All Are “Yes”	Then Transfer (Identify Type of Transfer)	If Any Are “No”	Then Lift (Identify Type of Lift)
Can the patient bear weight through one leg or both arms, to be moved from one surface to another?				
Is the patient consistent and reliable in bearing weight?				
Can the patient communicate with you?				
Can the patient follow commands?				
Is the patient free from pain or medical devices that may interfere with carrying out the procedure?				
Is the patient cooperative?				
Is the patient’s behaviour nonaggressive?				
Is the patient’s range of motion suitable for performing transfer?				
Is the patient’s strength suitable for performing a transfer?				
Are the patient’s mobility and balance suitable for performing a transfer?				
Are all environmental factors suitable?				
Are all equipment factors suitable?				
Are all caregivers able to perform the task?				

From Health Care Health and Safety Association of Ontario (HCHSA). (2003). *Handle with care: A comprehensive approach to developing and implementing a client handling program. Resource manual* (p. 101, Table 16). Toronto: Author. Retrieved from <http://www.osach.ca/products/resrcdoc/rrerge320toc.pdf>.

SKILL 45-2 Using Safe and Effective Transfer Techniques**video****Delegation Considerations**

The skills of effective transfer techniques can be delegated to unregulated care providers (UCPs). Patients who are transferred for the first time after prolonged bed rest, extensive surgery, critical illness, or spinal cord trauma usually require supervision by professional nurses. When delegating this skill, it is important to instruct the UCP about the following:

- The need to seek assistance before moving or lifting a heavy patient.
- Any patient limitations that may affect safe transfer techniques.

Procedure**STEPS**

1. Assess the patient for the following:

- A. Muscle strength (legs and upper arms)
- B. Joint mobility and contracture formation

Equipment

- Transfer belt, sling, or lapboard (as needed), nonskid shoes, bath blankets, pillows
- Wheelchair: Position chair at 45-degree angle to bed, lock brakes, remove footrests, lock bed brakes.
- Stretcher: Position at right angle (90 degrees) to bed, lock brakes on stretcher, lock brakes on bed.
- Mechanical or hydraulic lift: Use ceiling track or mechanical portable lift, and sling.

RATIONALE

- Provides information relative to the patient’s abilities, physical status, and ability to comprehend. The number of individuals needed to provide a safe transfer can then be determined.
- Patients who are immobile have decreased muscle strength, tone, and mass. Affects ability to bear weight or raise body.
- Immobility or inflammatory processes (e.g., arthritis) may lead to contracture formation and impaired joint mobility.

Continued

► SKILL 45-2 Using Safe and Effective Transfer Techniques—cont'd



C. Paralysis or paresis (spastic or flaccid)

D. Orthostatic hypotension

E. Activity tolerance

F. Presence of pain

G. Vital signs

2. Assess patient's sensory status:

A. Adequacy of central and peripheral vision

B. Adequacy of hearing

C. Loss of sensation

- Patient with central nervous system damage may have bilateral paralysis (requiring transfer by swivel bar, sliding bar, or mechanical lift) or unilateral paralysis, which requires belt transfer to "best" (unaffected) side. Weakness (paresis) requires stabilization of knee during transfer. Flaccid arm must be supported with sling during transfer.
- Determines risk of fainting or falling during transfer. Patients who are immobile may have decreased ability for autonomic nervous system to equalize blood supply, resulting in drop of 20 mm Hg or more in systolic blood pressure or 10 mm Hg in diastolic blood pressure when rising from sitting position.
- Determines ability of patient to assist with transfer.
- Pain may reduce patient's motivation and ability to be mobile. Pain relief before transfer enhances patient participation.
- Vital sign changes such as increased pulse and respiration may indicate activity intolerance (see Chapter 30).

- Determines influence of sensory loss on ability to make transfer. Visual-field loss may decrease patient's ability to transfer safely. Patients with visual and hearing losses need transfer techniques adapted to deficits. Patients with cerebrovascular accident (CVA) may lose area of visual field, which profoundly affects vision and perception.

Critical Decision Point: Patients with hemiplegia also may "neglect" one side of the body (inattention to or unawareness of one side of body or environment), which distorts perception of the visual field.

3. Assess patient's cognitive status.

- Determines patient's ability to follow directions and learn transfer techniques.

Critical Decision Point: Patients with head trauma or CVA may have perceptual cognitive deficits that create safety risks. If patient has difficulty in comprehension, simplify instructions and maintain consistency.

4. Assess patient's level of motivation:

A. Patient's eagerness or unwillingness to be mobile

B. Whether patient avoids activity and offers excuses

5. Assess previous mode of transfer (if applicable).

6. Assess patient's specific risk of falling when transferred.

7. Assess special transfer equipment needed for home setting.
Assess home environment for hazards.

8. Perform hand hygiene.

9. Explain procedure to patient.

10. Transfer patient:

A. Assist patient to sitting position.

(1) Place patient in supine position.

(2) Face head of bed at a 45-degree angle and remove pillows.

(3) Place feet apart with foot nearer bed behind other foot, continuing at a 45-degree angle to the head of the bed.

- Altered psychological states reduce the patient's desire to engage in activity.
- Determines mode of transfer and assistance required to provide continuity. Transfer belts should be used with all patients being transferred for the first time and thereafter as deemed necessary.
- Certain conditions increase the patient's risk of falling or potential for injury. Neuromuscular deficits, motor weakness, calcium loss from long bones, cognitive and visual dysfunction, and altered balance increase the risk of falls.
- Transfer ability at home is greatly enhanced by prior teaching of family and support people, and assessment of home for safety risks and functionality.
- Reduces transmission of microorganisms.
- Increases patient participation.
- Enables nurse to assess patient's body alignment continually and to administer additional care, such as suctioning or hygiene needs.
- Proper positioning reduces twisting of nurse's body when moving the patient. Pillows may cause interference when the patient is sitting up in bed.
- Improves balance and allows transfer of body weight as patient is sitting up in bed.

► SKILL 45-2 Using Safe and Effective Transfer Techniques—cont'd

video

- (4) Place hand farther from patient under shoulders, supporting patient's head and cervical vertebrae.
- (5) Place other hand on bed surface.
- (6) Raise patient to sitting position by shifting weight from front to back leg. Pivot feet as weight is shifted from front to back leg so that the upper body does not twist.
- (7) Push against bed with arm that is placed on bed surface.

- Maintains alignment of head and cervical vertebrae and allows for even lifting of patient's upper trunk.
- Provides support and balance.
- Improves balance, overcomes inertia, and transfers weight in direction in which patient is being moved.

B. Assist patient to sitting position on side of bed with bed in low position.

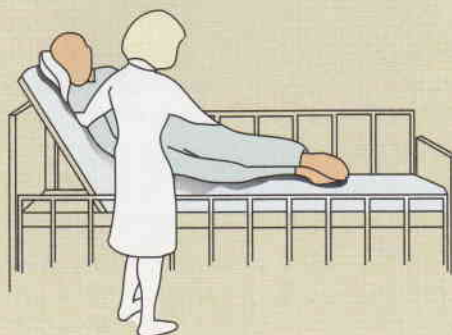
- (1) Turn patient to side facing you on side of bed on which patient will be sitting (see Step 10B[1] illustration).



Step 10B(1) Side-lying position.

- (2) Raise head of bed 30 degrees.
- (3) Stand opposite patient's hips. Turn diagonally so that you face patient and far corner of foot of bed.
- (4) Place feet apart with foot closer to head of bed in front of other foot.
- (5) Place arm nearer head of bed under patient's shoulders, supporting head and neck.
- (6) Place other arm over patient's thighs (see Step 10B[6] illustration).
- (7) Move patient's lower legs and feet over side of bed. Pivot toward rear leg, allowing patient's upper legs to swing downward.
- (8) At the same time, shift weight to rear leg and elevate patient (see Step 10B[8] illustration). Pivot feet in the direction of movement to avoid twisting of upper body.

- Divides activity between arms and legs and protects back from strain. By bracing one hand against the mattress and pushing against it as patient is lifted, part of the weight that would be lifted by the back muscles is transferred through the arm onto the mattress.
- Decreases amount of work needed by patient and nurse to raise patient to sitting position.

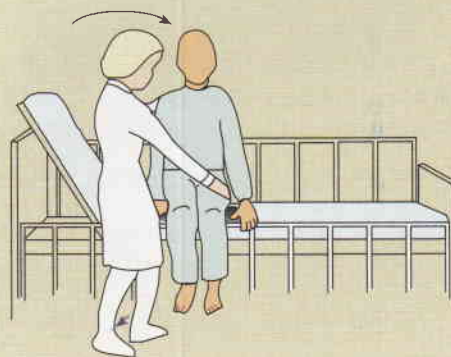


Step 10B(6) Nurse places arm over patient's thighs.

C. Transfer patient from bed to chair with bed in low position.

- (1) Assist patient to sitting position on side of bed. Have chair in position at 45-degree angle to bed. If the patient has hemiparesis or hemiplegia, place the chair on the patient's unaffected side.

- Prepares patient to move to side of bed and protects patient from falling.
- Places nurse's centre of gravity nearer patient. Reduces twisting of nurse's body by facing the direction of movement.
- Increases balance and allows nurse to transfer weight as patient is brought to sitting position on side of bed.
- Maintains alignment of head and neck as nurse brings patient to sitting position.
- Supports hip and prevents patient from falling backward during procedure.
- Decreases friction and resistance. Weight of patient's legs when off the bed allows gravity to pull down lower legs, and weight of legs assists in pulling upper body into sitting position.
- Reduces patient risk for falling. Patients who have been immobilized may experience lightheadedness or dizziness when assuming a sitting position.



Step 10B(8) Nurse shifts weight to rear leg and elevates patient.

- Positions chair within easy access for transfer. Enables the patient to transfer more safely by pivoting on the unaffected leg and reaching for the arm of the chair with the unaffected arm.

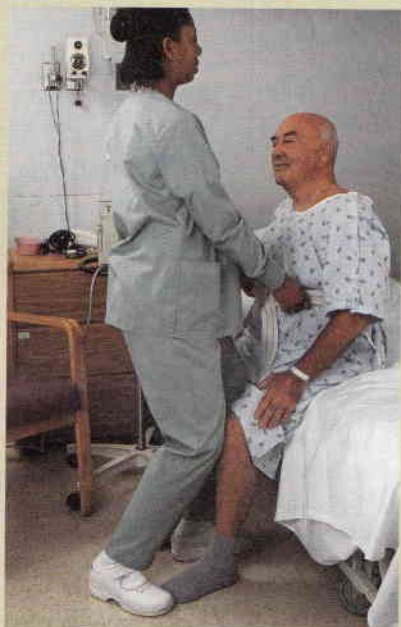
Continued

► SKILL 45-2 Using Safe and Effective Transfer Techniques—cont'd

- (2) Apply transfer belt or other transfer aids.
 - (3) Ensure that patient has stable nonskid shoes. Weight-bearing or unaffected (strong) leg is placed back with the affected (weak) knee slightly forward or parallel.
 - (4) Place feet shoulder-width apart.
 - (5) Flex hips and knees, supporting patient's weaker knee or leg with your knees (see Step 10C[5] illustration).
 - (6) Grasp transfer belt from underneath.
- Transfer belt maintains stability of patient during transfer and reduces risk of falling (Owen et al., 1999). Patient's arm should be in a sling if flaccid paralysis is present.
 - Nonskid soles decrease risk of slipping during transfer. Always have patient wear shoes during transfer; bare feet increase risk of falls. Patient will stand on unaffected (stronger, or weight-bearing) leg.
 - Ensures balance with wide base of support.
 - Flexion of knees and hips lowers the centre of gravity to object to be raised; supporting knees with nurse's knees allows for stabilization of patient's knee when the patient stands.
 - Transfer belt is grasped at patient's side to provide movement of patient at centre of gravity. Patients with upper extremity paralysis or paresis should never be lifted by or under the arms.

Critical Decision Point: A transfer belt or gait belt with handles should be used in place of the under-axilla technique. The under-axilla technique has been found to be physically stressful for nurses and uncomfortable for patients.

- (7) Rock patient up to standing position on count of 3 while straightening hips and legs and keeping knees slightly flexed (see Step 10C[7] illustration). Unless contraindicated, patient may be instructed to use hands to push up if applicable.
- Rocking motion gives patient's body momentum and requires less muscular effort for the nurse to lift patient.



Step 10C(5) Nurse flexes hips and knees, supporting patient's knee between nurse's knees.

- (8) Maintain stability of patient's weak or paralyzed leg between your knees.
- (9) Pivot on foot farther from chair. Instruct patient to stand straight. Pivot body in direction of chair, instructing patient to take small steps toward chair. Ask patient to tell you when the chair touches the back of his or her knees.



Step 10C(7) Nurse rocks patient to standing position.

- Ability to stand can often be maintained in a paralyzed or weak limb with support of nurse's knees to stabilize it.
- Maintains support of patient while allowing adequate space for patient to move.

► **SKILL 45-2 Using Safe and Effective Transfer Techniques—cont'd**

video

- (10) Instruct patient to use armrests on chair for support and ease patient into chair (see Step 10C[10] illustration).
- (11) Flex hips and knees while lowering patient into chair (see Step 10C[11] illustration).

- Increases patient stability.
- Prevents injury to nurse from poor body mechanics.



Step 10C(10) Patient uses armrests for support.



Step 10C(11) Nurse flexes hips and knees while easing patient into chair.

- (12) Assess patient for proper alignment for sitting position. Provide support for paralyzed extremities. Lapboard or sling will support flaccid arm. Stabilize leg with bath blanket or pillow.
- (13) Praise patient's progress, effort, or performance.

- Prevents injury to patient from poor body alignment.
- Continued support and encouragement provide incentive for the patient to persevere with these efforts.

D. Transfer patient from bed to stretcher or other bed, using drawsheet or friction-reducing device.

- (1) Place bed flat, and position at same level as stretcher. Ensure that bed brakes are locked.
- (2) Lower side rails. Have two caregivers stand on the side where the stretcher will be, while the third caregiver stands on the other side.
- (3) Two caregivers help patient roll onto side toward one caregiver.
- (4) Work together to position friction-reducing device properly under patient's back (see Step 10D[4] illustration).
- (5) Roll stretcher along side of bed. Lock wheels of stretcher once it is in place. Instruct patient to place arms across chest and not to move.
- (6) All three caregivers place feet widely apart with one foot slightly in front of the other, and grasp the friction-reducing device.

- Bed and stretcher need to be at the same level to allow patient to slide from bed to stretcher.
- Minimizes caregiver's stretching. Prevents patient from falling out of bed and promotes safety.
- Positions patient for friction-reducing lateral transfer device.
- Patient needs to be placed on transfer device properly to enable safe transfer.
- Positions stretcher correctly for transfer and prevents patient from falling out of bed.
- Prepares for transfer. Wide base of support allows nurse to shift weight and minimizes back strain.

Continued

► SKILL 45-2 Using Safe and Effective Transfer Techniques—cont'd

video

- (7) On the count of 3, caregivers pull the patient from the bed onto the stretcher, using the friction-reducing device and shifting weight appropriately (see Step 10D[7] illustration).



Step 10D(4) Two caregivers position sliding board under patient.

- (8) Put up side rail of stretcher on side where caregivers are, then roll stretcher away from side of bed and put side rails up on that side.
- E.** Use mechanical or hydraulic lift to transfer patient from bed to chair. Before using lift, be thoroughly familiar with its operation. Gather all necessary equipment and caregivers.
- (1) Choose the appropriate-size sling for patient's weight and height. Position lift properly at bedside.
 - (2) Position chair near bed, and allow adequate space to manoeuvre lift.
 - (3) Raise bed to a high position with mattress flat. Lower side rail.
 - (4) Keep bed side rail up on the side opposite you.
 - (5) Roll patient on side away from you.
 - (6) Place sling under patient. Place lower edge under patient's knees (wide piece); upper edge fits under patient's shoulders (narrow piece).
 - (7) Roll patient to opposite side and pull sling through.
 - (8) Roll patient supine onto sling.
 - (9) Remove patient's glasses, if present.
 - (10) If using transportable Hoyer lift, place lift's horseshoe bar under side of bed (on side with the chair).
 - (11) Lower horizontal bar to sling level by releasing hydraulic valve. Lock valve.
 - (12) Attach hooks on strap to holes in sling. Short straps hook to top holes of sling; longer straps hook to bottom of sling.
 - (13) Elevate head of bed.
 - (14) Fold patient's arms over chest.
 - (15) Use lift to raise patient off the bed and manoeuvre to chair (see Step 10E[15] illustration).

- Transfers patient smoothly and efficiently to the stretcher.



Step 10D(7) Transfer of patient from bed to stretcher, using friction-reducing device.

- Side rails prevent patient from falling off stretcher.
- Ensures safe elevation of patient off bed.
- Prepares environment for safe use of lift and subsequent transfer.
- Maintains nurses' alignment during transfer.
- Maintains patient safety.
- Allows positioning of patient on mechanical or hydraulic sling.
- Places sling under patient's centre of gravity and greatest portion of body weight.
- Completes positioning of patient on mechanical or hydraulic sling.
- Sling should extend from shoulders to knees (hammock) to support patient's body weight equally.
- Swivel bar is close to patient's head and could break eyeglasses.
- Positions lift efficiently and promotes smooth transfer.
- Positions hydraulic lift close to patient. Locking valve prevents injury to patient.
- Secures hydraulic lift to sling.
- Positions patient in sitting position.
- Prevents injury to paralyzed arms.

SKILL 45-2 Using Safe and Effective Transfer Techniques—cont'd

(16) Position patient and lower slowly into chair (see Step 10E[16] illustration).



Step 10E(15) Use mechanical lift to raise patient off the bed.

(17) Close check valve as soon as patient is down, and release straps.

(18) Remove straps and mechanical or hydraulic lift.

(19) Check patient's sitting alignment and correct it if necessary.

11. Perform hand hygiene.

12. With each transfer, evaluate patient's tolerance and level of fatigue and comfort.

13. After each transfer, evaluate patient's body alignment.

Not all patients require a fully mechanically assisted lift. Many types of lifts allow patients to partially weight bear. Benefits of these types of lifts include practice at standing, promotion of independence and control, and fostering of a sense of safety and confidence for patients who may have been immobile for a long period of time. An example of a lift that allows for partial weight bearing is the SERA Lift. Before using any lift, you should receive instruction and practise this skill (see Figure 45-19).

Unexpected Outcomes

Patient inability to comprehend and follow directions

Patient injury on transfer

Patient too weak for active transfer

Weight on non-weight-bearing limb

Uneven patient ability for transfer

Inability to stand during transfer

Localized areas of persistent erythema

• Moves patient from bed to chair.



Step 10E(16) Use mechanical lift to lower patient into the chair.

- If valve is left open, boom may continue to lower and injure patient.
- Prevents damage to skin and underlying tissues from canvas or hooks.
- Prevents injury from poor posture.
- Reduces transmission of microorganisms.
- Increased activity may result in symptoms associated with activity intolerance (e.g., increased pulse, changes in blood pressure, increased respirations, and decreased level of comfort). These patients may find transfer very tiring and will need post-transfer interventions to restore their level of comfort.
- Prompt identification of poor alignment reduces risks to the patient's skin and musculoskeletal systems.

Related Interventions

- Cognitive impairment affects learning and retention.
- Reassess continuity and simplicity.
- Cognitive impairment affects learning and retention.
- Reassess continuity and simplicity.
- Physical impairments require increased assistance from nursing personnel.
- Increase patient's bed activity and exercise to heighten tolerance.
- Certain conditions (e.g., hip fractures that have not been surgically stabilized) need to be non-weight bearing through the healing process.
- Reassess patient's understanding of weight-bearing status.
- Transfers may be difficult when the patient is fatigued or in pain. Assess the patient's ability before transfer (allow for a rest period before transferring, or medicate for pain if indicated).
- Periodic confusion may also alter performance.
- This results from increased fatigue, orthostatic hypotension, or pain.
- Provide for adequate assistance during transfer.
- Perform complete assessment of pressure ulcers and carry out appropriate interventions (see Chapter 46).

Continued

► SKILL 45-2 Using Safe and Effective Transfer Techniques—cont'd

video

Recording and Reporting

- Record procedure, including the following pertinent observations: patient's weakness, ability to follow directions, weight-bearing ability, balance, and ability to pivot; number of personnel needed to assist; and amount of assistance (muscle strength) required.
- Report any unusual occurrence to the nurse in charge. Report transfer ability and assistance needed to next shift or other caregivers. Report progress or remission to rehabilitation staff (physiotherapist or occupational therapist).

Home Care Considerations

- Teach family members about proper body mechanics for themselves and the patient.
- Provide community resources for hospital equipment that can be used in the home setting (e.g., transfer belts, mechanical lifts) to assist in safe transfer techniques.

* BOX 45-10

EVIDENCE-INFORMED PRACTICE GUIDELINE

Exercise Promotion: Reinitiating Exercise in the Patient Who Was Previously Immobile

- Encourage patient to contemplate change in activity level.
- Increase patient's awareness of current activity levels.
- Provide information about the benefits of exercise.
- Determine any impediments to exercise.
- Provide choices of physical activities.
- Assist patient in preparing for an activity program.
- Provide information about how to safely carry out the exercise (e.g., proper walking, safety considerations).
- Assist patient in strengthening exercise tolerance and activity levels.
- Emphasize patient's ability to become more active.
- Provide resources for social exercise groups (e.g., fitness groups, community walking programs, walking in local shopping malls).
- Assist patient in establishing an activity program.
- Provide positive, constructive feedback.
- Increase physical activity as appropriate for patient's mobility status.
- Assist patient in developing a long-term exercise plan.
- Visit the patient while he or she is participating in an exercise program.
- Assist patient in maintaining an activity program.
- Recognize each success.
- If relapse occurs, remind patient that it is okay and to continue with the exercise program.
- Maintain a supportive environment.
- Encourage family and friends to participate in the exercise program.



Figure 45-19 Using a cupped hand to support a joint.

you may support an extremity while the patient performs the movement, or the patient may be able to move some joints actively while you passively move others. In general, exercises should be as active as health and mobility allow. Passive ROM exercises should begin as soon as the patient's ability to move the extremity or joint is lost. Movements are carried out slowly and smoothly, just to the point of resistance, and should not cause pain. Never force a joint beyond its capacity. Each movement should be repeated five times during the session.

When performing passive ROM exercises, stand at the side of the bed closest to the joint being exercised. Passive ROM exercises are performed using a head-to-toe sequence and moving from larger to smaller joints. If an extremity is to be moved or lifted, place a cupped hand under the joint to support it (Figure 45-19), support the joint by holding the adjacent distal and proximal areas (Figure 45-20), or support the joint with one hand and cradle the distal portion of the extremity with the remaining arm (Figure 45-21). The following sections provide an overview of nursing considerations for ways to support major joints in the body. See Table 45-2 for detailed ROM exercises and illustrated motion for each joint.

Neck. A flexion contracture of the neck is a serious disability because the patient's neck is permanently flexed with the chin close to or actually touching the chest. Ultimately, the patient's body alignment is altered, the visual field is changed, and the level of independent functioning is decreased.

Shoulder. The shoulder is controlled by the deltoid muscle and rotator cuff muscles. When caring for a patient with limited shoulder mobility, you may need to provide support devices for the shoulder, such as slings when the patient is standing or sitting, or pillows when the patient is in bed. Correctly positioning the shoulder prevents pain, joint subluxation, and further changes in body alignment.

patient's ROM. In addition, during bathing, the extremities and joints are usually put through complete ROM.

Unless contraindicated, the care plan should include movement of the patient's extremities through the fullest ROM possible. ROM exercises may be active, passive, or somewhere in between (active assisted). With a weak patient, for example,

Source: Adapted from Jitramontree, N. (2001). Evidence-based protocol: Exercise promotion: Walking in elders. In M. G. Titler (Series Ed.), *Series on evidence-based practice for older adults*. Iowa City, IA: The University of Iowa College of Nursing Gerontological Nursing Interventions Research Center, Research Dissemination Core.

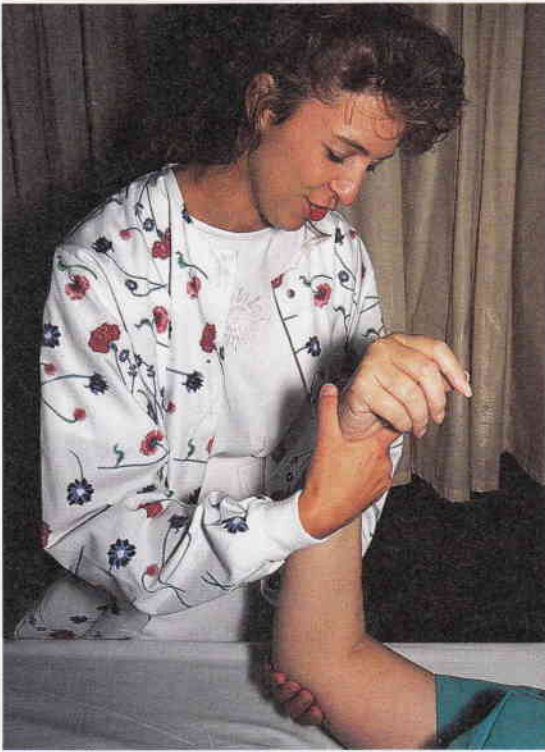


Figure 45-20 Supporting the joint by holding the distal and proximal areas adjacent to the joint.



Figure 45-21 Cradling the distal portion of an extremity.

Elbow. The elbow functions optimally at an angle of about 90 degrees. An elbow fixed in full extension is disabling and limits the patient's independence.

Forearm. Most functions of the hand are best carried out with the forearm in moderate pronation. When the forearm is fixed in a position of full supination, the patient's use of the hand is limited.

Wrist. The primary function of the wrist is to place the hand in slight extension, the position of functioning. Therefore, full ROM is not as great a priority as maintaining the wrist in a functional position. When the wrist is fixed in even a slightly flexed position, the grasp is weakened. In the patient who is immobilized, the functional position of the wrist can be achieved by using splints.

Fingers and Thumb. The ROM in the fingers and thumb enables the patient to perform ADLs and activities requiring fine motor skills, such as writing, carpentry, needlework,

drawing, and painting. The functional position of the fingers and thumb is slight flexion of the thumb in opposition to the fingers.

Hip. Because the lower extremities are involved chiefly with locomotion and weight bearing, stability of the hip joint may be more important than its mobility. For example, if the hip has no mobility but is fixed in a neutral position and fully extended, it is possible to walk without a significant limp.

Contractures often fix the hip in positions of deformity. Excessive abduction makes the affected leg appear too short, whereas excessive adduction makes the affected leg appear too long. In either case, the patient has limited mobility and walks with an obvious limp. Internal and external rotation contractures cause an abnormal and unbalanced gait.

Knee. A primary function of the knee is stability, which is achieved by ROM, ligaments, and muscles. However, the knees cannot remain stable under weight-bearing conditions unless quadriceps power is adequate for maintaining the knee in full extension. ROM exercises should include pulling the knee into full extension.

An immobile knee joint can result in serious disability. The degree of disability depends on the position in which the knee is stiffened. If the knee is fixed in full extension, the person must sit with the leg thrust out in front. When the knee is flexed, the person limps while walking. The greater the flexion, the greater is the limp.

Ankle and Foot. Without full ROM of the ankle, gait deviations will occur. If the joint is not stable, the person will fall. If joint mobility is diminished, you should maintain the joint in a position in which walking can be carried out with a forward rolling motion from the heel onto the forefoot.

When the person relaxes as in sleep or coma, the foot relaxes and assumes a position of plantar flexion. As a result, the foot may become fixed in plantar flexion (footdrop), which impairs the ability to walk. Inversion and eversion must also be avoided to allow the foot to rest flat on the floor.

Toes. Excessive flexion of the toes results in clawing. When this is a permanent deformity, the foot is unable to rest flat on the floor and the patient is unable to walk properly. Flexion contractures are the most common foot deformity associated with reduced joint mobility.

Adequate ROM provides the necessary mobility to carry out ADLs and exercise. In addition, adequate ROM in the lower extremities allows walking.

Walking. In the normal walking posture, the head is erect; the cervical, thoracic, and lumbar vertebrae are aligned; the hips and knees have appropriate flexion; and the arms swing freely with the legs. Illness or trauma can reduce activity tolerance, so that assistance in walking is required. In addition, temporary or permanent damage to the musculoskeletal and nervous systems may necessitate use of an assistive device for walking.

Helping a Patient Walk. When a patient's mobility has restricted the ability to walk, you must assess the patient's activity tolerance, tolerance to the upright position (orthostatic hypotension), strength, level of pain, coordination, and balance to determine the amount of assistance needed. Before getting the patient up, ensure the patient is wearing supportive, nonskid shoes.

Explain to the patient how far the patient should try to walk, who is going to help, when the walk will take place, and why walking is important. In addition, you and the patient should determine how much independence the patient can assume.

Check the walking environment to be sure that no obstacles are in the patient's path. Clear chairs, overbed tables, and wheelchairs out of the way so that the patient has ample room to walk safely. Before starting, establish rest points in case activity tolerance is less than estimated or the patient becomes dizzy. For example, a chair might be placed in the hall for the patient to rest, if needed. Provide support at the waist so that the patient's centre of gravity remains midline. This can be achieved by placing both hands at the patient's waist or using a gait belt. A gait belt is a belt that is placed around the lower rib cage to provide stability; it has handles that you can hold while the patient ambulates. The proper way to apply the belt is to keep two fingers between it and the patient's body. Tighten the belt until it has just enough room for your fingers. If the belt is too loose, it might slip upward and injure the patient's chest (particularly in women) or increase your risk of dropping the patient once weight is put on the belt. While walking, the patient should not lean to one side because this alters the centre of gravity, distorts balance, and increases the risk of falling. Walk to the side and slightly behind the patient (Figure 45-22).

A patient who at any point appears unsteady or complains of dizziness should be returned to a nearby bed or chair. If the patient has a syncopal (fainting) episode or begins to fall, assume a wide base of support with one foot in front of the other, providing enough support of the patient's body weight to prevent injury (Figure 45-23, A). Protecting the patient's head is the primary goal, but take care to avoid being injured yourself. To extend your front leg, move your back foot further away, and slide the patient against your forward leg to ease him or her to the floor (see Figure 45-23, B and 45-23, C). Practise this technique with a friend or classmate before attempting it in a clinical setting. When the patient attempts to ambulate again, proceed more slowly, monitoring for complaints of dizziness; also monitor the patient's blood pressure before, during, and after ambulation. Do not attempt to lift a patient manually from the floor, alone or with assistance. The best option is to allow the patient to get up without help, if possible, or to use mechanical lifting equipment.

Figure 45-22 When helping a patient walk, the nurse uses a gait belt and walks slightly behind the patient's side. **Source:** Sorrentino, S. A., Wilk, M. J., & Newmaster, R. (2009). *Mosby's Canadian textbook for the support worker* (2nd ed., p. 439, Fig. 24-22). Toronto: Elsevier.

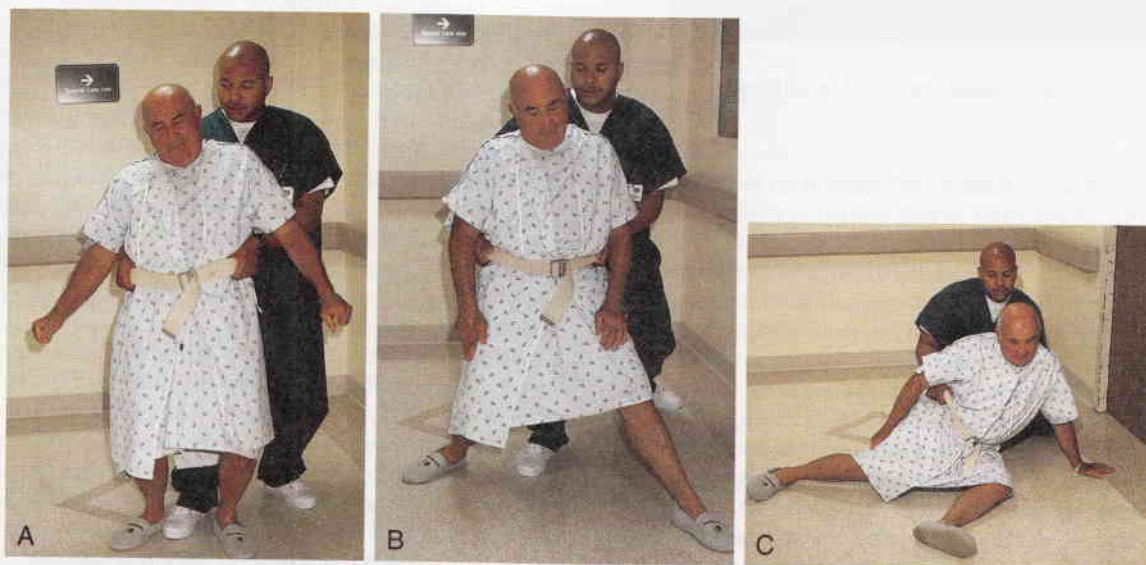


Figure 45-23 A, Stand with feet apart to provide a broad base of support. B, Extend one leg and let patient slide against it to the floor. C, Bend knees to lower body as patient slides to the floor.



Figure 45-24 Patient using a standard walker.

If you do not have a lot of strength and are unable to ambulate a patient alone, you should request help. The two-nurse method helps distribute the patient's weight evenly. The two nurses stand on either side of the patient. Each nurse's near arm is around the patient's waist, and the other arm is around the inferior aspect of the patient's arm so that both nurses' hands are supporting the patient's axillae.

Using Assistive Devices for Walking. Patients recovering from a lengthy illness that required bed rest and whose mobility is impaired frequently require assistive devices to help them with ambulation. These devices include canes, walkers, and crutches. The patient and family must be educated in the use of these devices.

Walkers. Walkers are extremely light, moveable devices that are about waist high and made of metal tubing used to assist patients with walking. There are standard walkers that have four widely placed, sturdy, rubber-tipped legs (Figure 45-24). These are used by patients who need the most support when walking. The patient holds the handgrips on the upper bars, moves the walker forward, takes a step with the weaker or painful leg, and then takes a step with the unaffected leg. There are also two-wheeled walkers that have two wheels in the front and two sturdy legs in the back (Figure 45-25). These provide for support also, but allow the patient to move more quickly as the walker does not have to be lifted with each step. There are also walkers with four wheels, brakes, and a seat, often called rollators or rollator walkers (Figure 45-26). These walkers are used with patients who have mild balance problems.

Canes. Canes are lightweight, easily moveable devices made of wood or metal. They provide less support than a walker and are less stable. A person's cane length is equal to the distance between the floor and the crease at their wrist when they are standing tall with their arm straight down at their side. Two common types of canes are the single straight-legged cane and the quad cane. The single straight-legged cane is more common and is used to support and balance a patient with decreased leg strength. This cane should be kept on the stronger side of the body. For maximum support when walking, the patient places the cane forward 15 to 25 cm,



Figure 45-25 Patient using a two-wheeled walker.



Figure 45-26 Patient using a rollator walker.

keeping the body weight on both legs. The weaker leg is moved forward to the cane so that the body weight is divided between the cane and the stronger leg. The stronger leg is then advanced past the cane so that the weaker leg and body weight are supported by the cane and weaker leg. During walking, the patient continually repeats these three steps. The patient must be taught that two points of support, such as both feet or one foot and the cane, are present at all times.

The quad cane provides the most support and is used when partial or significant leg paralysis or some hemiplegia is present. The same three steps used with the straight-legged cane are used with the quad cane and need to be taught to the patient.

Crutches. Crutches are often needed to increase mobility. Begin crutch instruction with guidelines for safe use (Box 45-11). The use of crutches may be temporary, such as after ligament damage to the knee. A patient with paralysis of the


BOX 45-11 PATIENT TEACHING
Crutch Safety
Objective

- Patient will describe and demonstrate safe crutch walking.

Teaching Strategies

- Teach patient with axillary crutches about the dangers of pressure on the axillae, which occurs when leaning on the crutches to support body weight.
- Explain why the patient must use crutches that were measured for him or her.
- Show the patient how to routinely inspect crutch tips. Rubber tips should be securely attached to the crutches. When tips become worn out, they should be replaced. Rubber crutch tips increase surface friction and help prevent slipping.
- Explain that the crutch tips should remain dry. Water decreases surface friction and increases the risk of slipping.
- Explain that the patient should wear nonslip shoes and not wear an open gown or other long, flowing clothing to decrease the risk of falls.
- Show patient how to inspect the structure of the crutches.
- Cracks in a wooden crutch decrease its ability to support weight. Bends in aluminum crutches can alter body alignment.
- Provide patient with a list of medical supply companies in the community where repairs, new rubber tips, handgrips, and crutch pads can be obtained.
- Instruct patient to have spare crutches and spare tips readily available.

Evaluation

- Patient can describe principles of crutch safety.
- Patient correctly demonstrates proper use of crutches.



Figure 45-27 Double adjustable Lofstrand, or forearm, crutch.

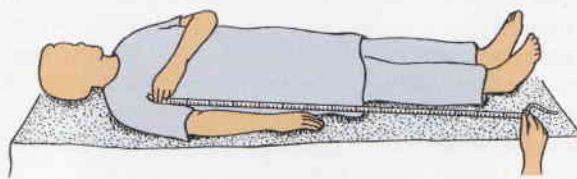


Figure 45-28 Measuring crutch length.

lower extremities, by contrast, may need crutches permanently. A crutch is a wooden or metal staff. The two types of crutches are the double adjustable Lofstrand, or forearm, crutch (Figure 45-27) and the axillary wooden or metal crutch. The forearm crutch has a handgrip and a metal band that fits around the patient's forearm. The metal band and the handgrip are adjusted to fit the patient's height. The axillary crutch has a padded curved surface at the top, which fits under the axilla. A handgrip in the form of a crossbar is held at the level of the palms to support the body. It is important that crutches be measured for the appropriate length and that patients be taught to use their crutches safely, to achieve a stable gait, to ascend and descend stairs, and to rise from a sitting position.

Measuring for Crutches. The axillary crutch is the more common crutch used. Measurements include the patient's height, the angle of elbow flexion, and the distance between the crutch pad and the axilla. When crutches are fitted, the length of the crutch should be from three to four fingerwidths from the axilla to a point 15 cm lateral to the patient's heel (Hoeman, 2008; Figure 45-28).

The handgrips should be positioned so that the patient's body weight is not supported by the axillae. Pressure on the axillae increases risk to underlying nerves, which could result in partial paralysis of the arm. Correct position of the handgrips is determined with the patient upright, supporting weight by the handgrips with the elbows slightly flexed at 30 degrees.



Figure 45-29 Verifying correct distance between crutch pads and axilla.

When the height and placement of the handgrips have been determined, you should again verify that the distance between the crutch pad and the patient's axilla is three to four fingerwidths (Figure 45-29).

Crutch Gait. The **crutch gait** is assumed by alternately bearing weight on one or both legs and on the crutches. The

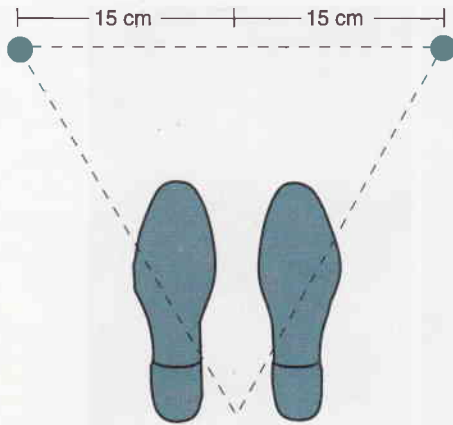


Figure 45-30 Tripod position, basic crutch stance.

gait selected by the physician is determined by assessing the patient's physical and functional abilities and the disease or injury that resulted in the need for crutches. This section summarizes the basic crutch stance and the four standard gaits: four-point alternating gait, three-point alternating gait, two-point gait, and swing-through gait.

The basic crutch stance is the tripod position, formed when the crutches are placed 15 cm in front of and 15 cm to the side of each foot (Figure 45-30). This position improves the patient's balance by providing a wider base of support. The body alignment of the patient in the tripod position is an erect head and neck, straight vertebrae, and extended hips and knees. The tripod position is assumed before crutch walking.

Three-point alternating, or three-point, gait requires the patient to bear all of the weight on one foot. In a three-point gait, weight is borne on both crutches and then on the unaffected leg, and the sequence is repeated (Figure 45-31). The affected leg does not touch the ground during the early phase of the three-point gait. Gradually, the patient progresses to touchdown and full weight bearing on the affected leg.

The two-point gait requires at least partial weight bearing on each foot (Figure 45-32). The patient moves a crutch at the same time as the opposing leg, so that the crutch movements are similar to arm motion during normal walking.

The swing-through, or swing-through gait, is frequently used by patients with paraplegia who wear weight-supporting braces on their legs. With weight placed on the supported legs, the patient places the crutches one stride in front and then swings to or through the crutches while they support the patient's weight.

Crutch Walking on Stairs. When ascending stairs on crutches, the patient usually uses a modified three-point gait (Figure 45-33). The patient stands at the bottom of the stairs and transfers body weight to the crutches. The unaffected leg is advanced between the crutches to the stairs. The patient then shifts weight from the crutches to the unaffected leg. Finally, the patient aligns both crutches on the stairs. This sequence is repeated until the patient reaches the top of the stairs.

To descend the stairs (Figure 45-34), a three-phase sequence is also used. The patient transfers body weight to the unaffected leg. The crutches are placed on the stairs, and the patient begins to transfer body weight to the crutches, moving the affected leg forward. Finally, the unaffected leg is moved to the stairs with the crutches. Again, the patient repeats the sequence until reaching the bottom of the stairs.

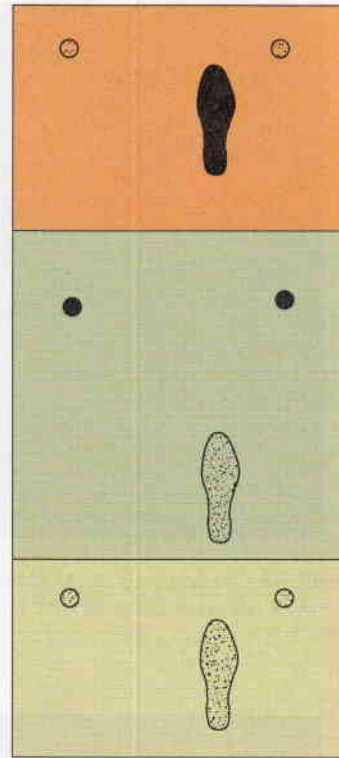


Figure 45-31 Three-point gait with weight borne on unaffected leg. Solid foot and crutch tips show weight bearing in each phase. (Read from bottom to top.)

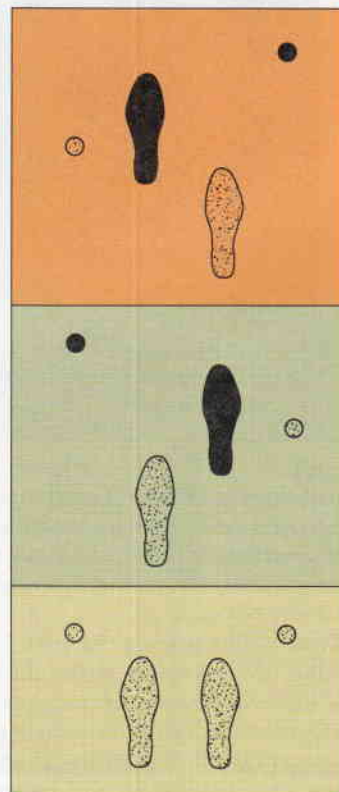


Figure 45-32 Two-point gait with weight borne partially on each foot and each crutch advancing with opposing leg. Solid areas indicate leg and crutch tips bearing weight. (Read from bottom to top.)



Figure 45-33 Ascending stairs. A, Weight is placed on crutch. B, Weight is transferred from crutches to unaffected leg on stairs. C, Crutches are aligned with unaffected leg on stairs.



Figure 45-34 Descending stairs. A, Body weight is on unaffected leg. B, Body weight is transferred to crutches. C, Unaffected leg is aligned on stairs with crutches.

Because in most cases patients will need to use crutches for some time, they should be adequately taught to use crutches on stairs before discharge. This instruction applies to all crutch-dependent patients, not just those who have stairs in their homes.

Sitting in a Chair With Crutches. As with crutch walking and crutch walking up and down stairs, the procedure for sitting in a chair involves phases and requires the patient to transfer weight (Figure 45-35). First, the patient gets positioned at the centre front of the chair with the posterior aspect of the legs touching the chair. Then the patient holds both crutches in the hand opposite the affected leg. If both legs are affected, as with a patient with paraplegia who wears weight-supporting braces, the crutches are held in the hand on the patient's stronger side. With both crutches in one hand, the

patient supports body weight on the unaffected leg and the crutches. While still holding the crutches, the patient grasps the arm of the chair with the remaining hand and lowers his or her body into the chair. To stand, the procedure is reversed, and the patient, when fully erect, should assume the tripod position before beginning to walk.

◆Evaluation

Patient Care

To evaluate outcomes and response to nursing care, measure the effectiveness of all interventions. Compare the actual outcomes with the outcomes selected during planning. Evaluate specific interventions designed to promote body alignment, improve mobility, and protect the patient from the hazards of

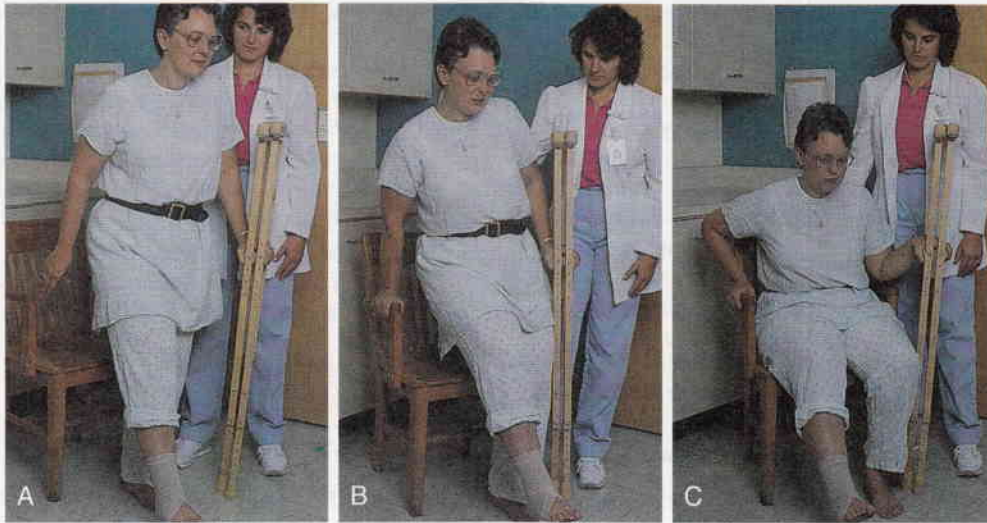


Figure 45-35 Sitting in a chair. **A**, Both crutches are held by one hand. Patient transfers weight to crutches and unaffected leg. **B**, Patient grasps arm of chair with free hand and begins to lower herself into chair. **C**, Patient completely lowers herself into chair.

immobility. Also evaluate patient and family instruction to prevent future risks to body alignment and hazards of immobility (Figure 45-36). The evaluation enables you to determine whether new or revised therapies are required and if new nursing diagnoses have developed.

Patient Expectations

Patients who are immobile and dependent on others for some or all of their needs can become overly dependent or try to do too much themselves too early. Finding the balance between independence and dependence is a difficult task. Patients will want control over mobility that is personally satisfactory. For the patient who is completely dependent on others for care, control over how and when things are done may be very important. Do patients feel they are treated with dignity? Do caregivers treat them as adults? Are they given opportunities to make meaningful choices?

❖ KEY CONCEPTS

- Body mechanics are the coordinated efforts of the musculoskeletal and nervous systems as the person moves, lifts, bends, stands, sits, lies down, and completes daily activities.
- Balance is assisted through nervous system control by the cerebellum and inner ear.
- Range-of-motion (ROM) exercises include one or all of the body joints and can be active or passive.
- Body alignment is the condition of joints, tendons, ligaments, and muscles in various body positions.
- Balance is achieved when a wide base of support is present, the centre of gravity falls within the base of support, and a vertical line falls from the centre of gravity through the base of support.
- Developmental stages influence body alignment and mobility; the greatest impact of physiological changes on the musculoskeletal system is observed in children and older adults.
- The risk of disabilities related to immobilization depends on the extent and duration of immobilization and the patient's overall level of health.

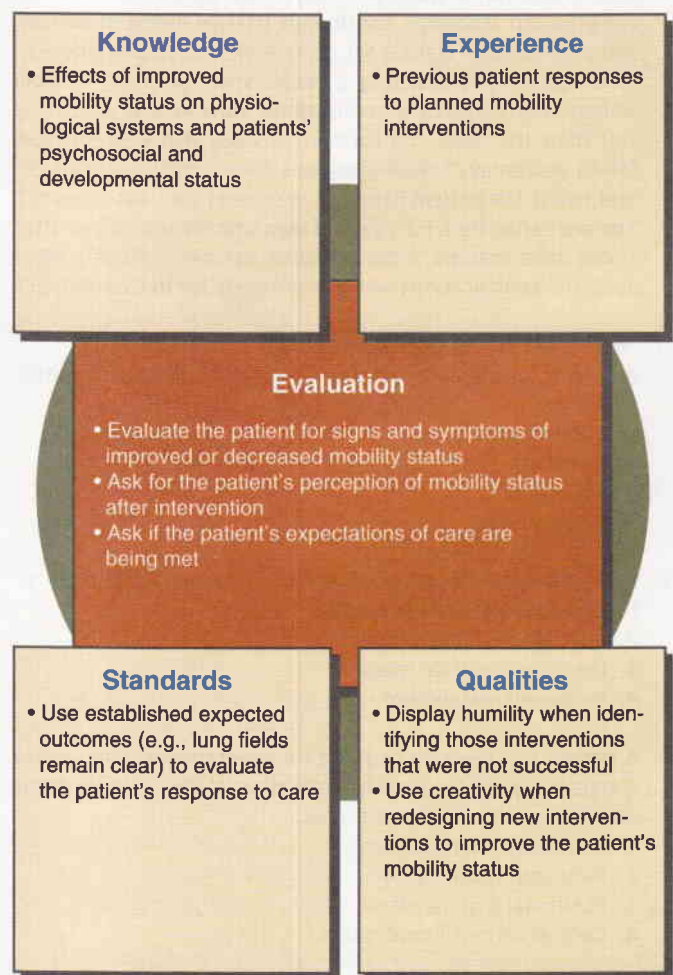


Figure 45-36 Critical thinking model for immobility evaluation.

- Immobility may result from illness or trauma or may be prescribed for therapeutic reasons (bed rest).
- Immobility presents hazards in the physiological, psychological, and developmental dimensions.
- Use the nursing process and critical thinking synthesis to provide care for patients who are experiencing or are at risk for the adverse effects of impaired body alignment and immobility.
- After identifying nursing diagnoses, plan and implement interventions to prevent or minimize the hazards and complications of impaired body alignment and immobilization.
- Patients with weakness and impaired function of the nervous, skeletal, or muscular system often require nursing assistance to attain proper body alignment while in bed or sitting and to transfer from a bed to a chair.
- Positioning devices help patients maintain good body alignment while lying or sitting.
- Assistive devices to promote walking include canes, walkers, and crutches.

✦ CRITICAL THINKING EXERCISES

1. You are caring for a 57-year-old man who had bilateral total knee replacements for osteoarthritis two days ago. He is beginning to transfer to a chair with help. He is 45 kg overweight and has a history of deep vein thrombosis. He has compression stockings, continuous passive range of motion, and a saline lock. Make a list of potential nursing diagnoses.
2. When you are conducting a home visit for a 75-year-old woman, the patient's granddaughter runs in and says, "Did you show the nurse the sore on your leg that you got from falling yesterday?" What questions about mobility are important to ask the patient? How do you begin your assessment?
3. You are caring for a 68-year-old man who is immobilized after spinal cord trauma from a motor vehicle accident. What potential complications would you assess for in this patient?

✦ REVIEW QUESTIONS

1. A patient is unable to dorsiflex or evert the foot, a condition known as
 1. Kyphoscoliosis
 2. Footdrop
 3. Torticollis
 4. Kyphlordosis
2. A physiological risk associated with prolonged immobility is
 1. Decreased bone resorption
 2. Increased cardiac output
 3. Decreased muscle mass
 4. Increased metabolism
3. A patient has been on bed rest for several days. The patient stands and you note that the patient's systolic pressure drops 20 mm Hg. This is referred to as
 1. Orthostatic hypotension
 2. Rebound hypotension
 3. Positional hypotension
 4. Central venous hypotension
4. Elastic stockings help to prevent thrombus formation by
 1. Preventing varicose veins
 2. Preventing muscular atrophy
 3. Increasing venous return
 4. Ensuring joint mobility

5. The patient at greatest risk for developing adverse effects of immobility is a
 1. 3-year-old child with a fractured femur
 2. 48-year-old woman after a thyroidectomy
 3. 78-year-old man in traction for a broken hip
 4. 38-year-old woman undergoing a hysterectomy
6. A patient has been immobilized for five days because of extensive abdominal surgery. When getting this patient out of bed for the first time, a nursing diagnosis related to the safety of this patient would be
 1. Pain
 2. Impaired skin integrity
 3. Altered tissue perfusion
 4. Risk for activity intolerance
7. The following device allows the patient to pull with the upper extremities to raise the trunk off the bed, to assist in transfer from bed to wheelchair, or to perform upper arm exercises:
 1. Trapeze bar
 2. Trochanter roll
 3. Hand rolls
 4. Footboard
8. The patient in this position is lying chest down:
 1. Supine
 2. Prone
 3. Fowler's
 4. Lateral
9. When positioning a patient in the supported Fowler's position, you would place a small pillow under the patient's thighs to
 1. Decrease intracranial pressure
 2. Support the lumbar vertebrae
 3. Prevent occlusion of popliteal artery
 4. Prevent pressure of mattress on heel

✦ RECOMMENDED WEB SITES

Canadian Association of Rehabilitation Nurses (CARN): <http://www.carn.ca>

This Web page provides access to the CARN and includes information about membership, education events, and Canadian certification in rehabilitation nursing.

(American) Association of Rehabilitation Nurses: <http://www.rehabnurse.org/>

This Web page provides an extensive list of links to resources for nurses working with patients with actual or potential impairments or disabilities. It provides information about both prevention and treatment. Although the content has an American orientation, it is also useful to Canadian nurses.

Canadian Physical Activity Guidelines: <http://www.csep.ca/english/view.asp?x=804>

This Web page of the Canadian Society of Exercise Physiologists provides guides to physical activity for all age groups and includes a guideline specific to those with spinal cord injuries. These guides are a good source of consumer education on the benefits of activity.

Osteoporosis Canada: Health Professionals Resource Links: <http://www.osteoporosis.ca>

Osteoporosis Canada is a national organization that works toward educating and supporting individuals and communities in the prevention and treatment of osteoporosis. This site

provides numerous links to evidence-informed resources on osteoporosis.

The Registered Nurses' Association of Ontario (RNAO) Best Practice Guidelines: *Prevention of Falls and Injury in the Older Adult*: <http://www.rnao.org/Page.asp?PageID=924&ContentID=810>

The RNAO has developed a series of practice guidelines based on the consensus of nurse experts across a variety of practice,

academic, and research agencies. This site provides information on patient participation in ADLs, cognition, continence, strength, gait, and balance in relation to the risk for falls.

Review Question Answers

1, 2, 2, 3, 3, 1, 4, 3, 5, 3, 6, 4, 7, 1, 8, 2, 9, 3

Rationales for the Review Questions appear at the end of the book.

Skin Integrity and Wound Care

Written by Rosemary Kohr, RN, MScN, PhD, Tertiary Care Nurse Practitioner Certificate (UWO, 1998)

Based on the original chapter by Janice Colwell, RN, MS, CWOCN, FAAN

objectives

Mastery of content in this chapter will enable you to:

- Describe the key terms listed.
- Discuss the risk factors that contribute to pressure ulcer formation.
- Recognize the stages of pressure ulcers.
- Describe the etiology and key components of venous, arterial, diabetic, and malignant wounds.
- Discuss the normal process of wound healing.
- Describe the differences between wounds that heal by primary and secondary intention.
- Describe the complications of wound healing.
- Explain the factors that impede or promote wound healing.
- Describe the differences in nursing care for acute and chronic wounds.
- Describe the types of dressings appropriate for moist wound healing.
- Complete an assessment for a patient with impaired skin integrity.
- List nursing diagnoses associated with impaired skin integrity.
- Develop a nursing care plan for a patient with impaired skin integrity.
- List appropriate nursing interventions for a patient with impaired skin integrity.
- State evaluation criteria for a patient with impaired skin integrity.

key terms

- | | |
|--------------------------------|------------------------------|
| Abrasion, p. 1268 | Hyperemia, p. 1252 |
| Approximated, p. 1264 | Induration, p. 1257 |
| Blanching, p. 1252 | Laceration, p. 1268 |
| Collagen, p. 1256 | Nonviable tissue, p. 1261 |
| Darkly pigmented skin, p. 1252 | Pressure ulcer, p. 1251 |
| Debridement, p. 1277 | Primary intention, p. 1264 |
| Dehiscence, p. 1271 | Puncture, p. 1268 |
| Drainage evacuators, p. 1294 | Purulent, p. 1269 |
| Epithelialization, p. 1266 | Sanguineous, p. 1269 |
| Eschar, p. 1261 | Secondary intention, p. 1264 |
| Evisceration, p. 1271 | Serosanguineous, p. 1269 |
| Exudate, p. 1262 | Serosus, p. 1269 |
| Fibrin, p. 1265 | Shear, p. 1253 |
| Fistula, p. 1271 | Slough, p. 1261 |
| Friction, p. 1256 | Sutures, p. 1291 |
| Granulation tissue, p. 1261 | Tissue ischemia, p. 1252 |
| Hematoma, p. 1271 | Wound, p. 1264 |
| Hemorrhage, p. 1270 | Wound contraction, p. 1265 |
| Hemostasis, p. 1265 | |

media resources

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Skin, the body's largest organ, constitutes 15% of the total adult body weight (Wysocki, 2007). It protects against disease-causing organisms; senses pain, temperature, and touch; and synthesizes vitamin D. Injury to the skin poses risks to safety and triggers a complex healing response.

As a nurse, one of your most important responsibilities is to monitor skin integrity and prevent skin breakdown. Understanding normal wound healing helps in planning, implementing, and assessing interventions that maintain skin integrity and optimize wound healing.

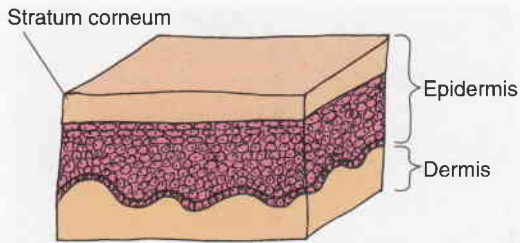


Figure 46-1 Layers of skin. **Source:** Pires, M., & Muller, A. (1991). Detection and management of early tissue pressure indicators: A pictorial essay. *Progressions*, 3(3), 3.

Scientific Knowledge Base

Skin

The skin has two layers: the epidermis and the dermis (Figure 46-1). These two layers are separated by a membrane, often referred to as the dermal–epidermal junction. The epidermis, or top layer, also consists of several layers. The stratum corneum is the thin, outermost layer of the epidermis, consisting of flattened, keratinized cells. The cells originate from the innermost epidermal (or basal) layer. These cells divide, proliferate, and migrate toward the epidermal surface.

After cells reach the stratum corneum, they flatten and die. This constant movement ensures replacement of surface cells sloughed during normal desquamation or shedding. The stratum corneum protects underlying cells and tissues from dehydration and prevents the entrance of certain chemical agents. The stratum corneum allows the evaporation of water from the skin and permits the absorption of certain topical medications.

The dermis, the inner layer of the skin, provides tensile strength, mechanical support, and protection to the underlying muscles, bones, and organs. It differs from the epidermis in that it contains mostly connective tissue and few skin cells. Collagen (a tough, fibrous protein), blood vessels, and nerves are in the dermal layer. Fibroblasts, which are responsible for collagen formation, are the only distinctive cell type within the dermis.

Understanding skin structure helps you to maintain skin integrity and promote wound healing. Intact skin protects the patient from chemical and mechanical injuries. When the skin is injured, the epidermis functions to resurface the wound and restore the barrier against invading organisms while the dermis responds to restore the structural integrity (collagen) and the physical properties of the skin. Age alters skin characteristics and makes skin more vulnerable to damage. Box 46-1 provides a summary of the changes in aging skin.

Pressure Ulcers

Pressure ulcer, *pressure sore*, *decubitus ulcer*, and *bedsore* are terms used to describe impaired skin integrity related to unrelieved, prolonged pressure. The most current terminology is *pressure ulcer*, which is consistent with the recommendations of the pressure ulcer guidelines developed by the Registered Nurses' Association of Ontario (RNAO) (RNAO, 2007). A **pressure ulcer** is localized injury to skin and underlying tissue, usually over a bony prominence, as a result of pressure, or in combination with shear and/or friction (Figure 46-2).

Pressure ulcers have a high prevalence rate in all health care settings. It is estimated that one individual in four within the

* BOX 46-1 FOCUS ON OLDER ADULTS

Skin-Associated Issues

- Age-related changes, such as reduced skin elasticity, decreased collagen, and thinning of underlying muscle and tissues, cause the older adult's skin to be easily torn via mechanical trauma, especially shearing forces (Wysocki, 2007).
- Concomitant medical conditions and polypharmacy, common in the older adult, interfere with wound healing.
- The attachment between the epidermis and dermis becomes flattened in older adults, allowing skin to be easily torn from mechanical trauma (e.g., tape removal).
- Aging causes a diminished inflammatory response, resulting in slow epithelialization and wound healing (Doughty & Sparks-Defries, 2007).
- The hypodermis decreases in size with age. Older patients have little subcutaneous padding over bony prominences, so they are more prone to skin breakdown (Wysocki, 2007).
- Reduced nutritional intake, commonly seen in older adults, increases the risk of pressure ulcer development and impaired wound healing (Posthauer & Thomas, 2004).



Canadian health care system has some issue with skin integrity (Woodbury & Houghton, 2004). The prevalence rate in acute care settings is 25%; nonacute care settings (including long-term care facilities), 30%; and community care and home care settings, 15% (Woodbury & Houghton, 2004).

The impact of pressure ulcers and other chronic wounds on quality of life is significant, as normal activities may be restricted because of pain, odour, or treatments. Costs associated with chronic wound care can substantially increase the burden on the health care system. It has been estimated that in the United States, an increase of 50% of nursing time along with treatments can cost from \$10,000 to \$86,000 (US\$; in Canadian currency, \$12,300 to \$105,800) (Clarke et al., 2005).

Thus, it is essential that attention be paid to the causes of pressure ulcers as well as to the healing process of wounds. The focus of this text is on pressure ulcer prevention and treatment options, but other chronic wounds, such as diabetic, arterial, venous, and malignant wounds, will be briefly discussed and are important for you to recognize and treat. Additional resources are readily available on Web sites for the Canadian Association of Wound Care (CAWC), the Canadian Association of Enterostomal Therapists (CAET), and the Registered Nurses' Association of Ontario (RNAO), which has produced a large number of evidence-informed best practice guidelines for pressure ulcers, venous leg ulcers, diabetic foot ulcers, continence, and constipation, among others. These and other resources are provided for you at the end of this chapter.

Pathogenesis of Pressure Ulcers. Pressure is the major element in the cause of pressure ulcers. Three pressure-related factors contribute to pressure ulcer development: (1) pressure intensity, (2) pressure duration, and (3) tissue tolerance.

Pressure Intensity. A classic research study identified capillary closing pressure as the minimal amount of pressure required to collapse a capillary (e.g., when the pressure exceeds the normal capillary pressure range of 15 to 32 mm Hg) (Burton & Yamada, 1951). Therefore, if pressure applied over a capillary exceeds the normal capillary pressure and the vessel is

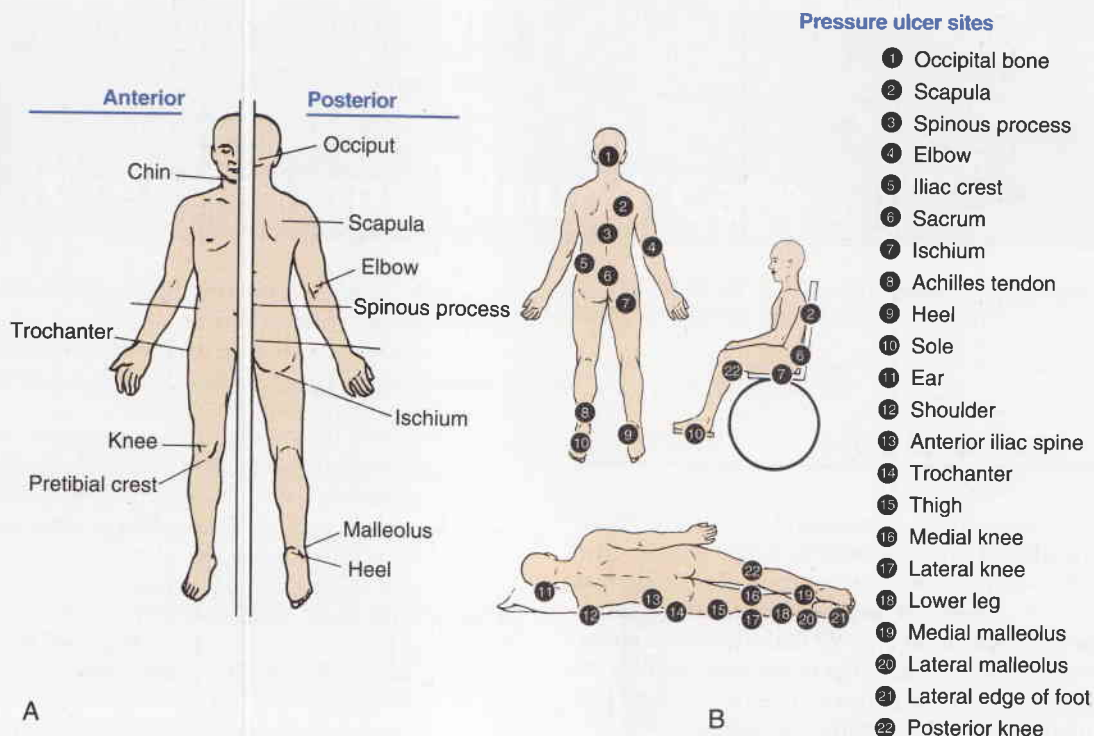


Figure 46-2 A, Bony prominences most frequently underlying pressure ulcers. B, Common pressure ulcer sites. **Source:** Adapted from Trelease, C. C. (1988). Developing standards for wound care. *Ostomy/Wound Management*, 20, 46.

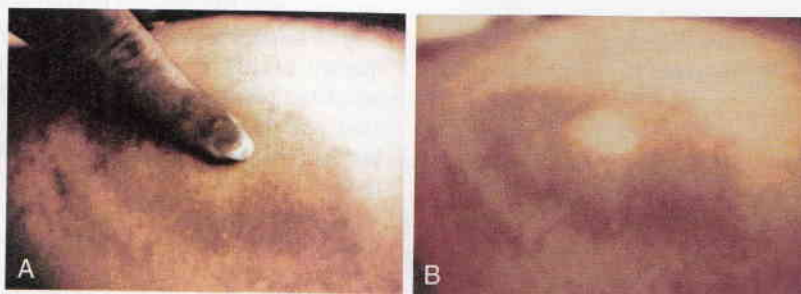


Figure 46-3 A, Reactive hyperemia. B, Blanching erythema: blanches with fingertip pressure.

occluded for a prolonged period of time, **tissue ischemia**, or reduction in blood flow, can occur. If the patient has decreased sensation and thus does not have the cue of discomfort to prompt shifting (off-loading) pressure, tissue death may result. The clinical presentation of obstructed blood flow occurs when you evaluate areas of pressure. After a period of tissue ischemia, if pressure is relieved and blood flow returns, the skin turns red. The effect of this redness is vasodilatation (blood vessel expansion), called **hyperemia** (redness) (Figure 46-3, A). Evaluate the area of hyperemia by pressing a finger over the affected area. If the area blanches (turns lighter in colour) (Figure 46-3, B) and the redness returns when you remove your finger, hyperemia is transient and is an attempt to overcome the ischemic episode; thus, it is called **blanching hyperemia** (Pieper, 2007).

If, however, the erythematous area does not blanch (non-blanching erythema) (Figure 46-4) when you apply pressure, deep tissue damage is probable.

Blanching occurs when the normal red tones of light-skinned patients are absent. Blanching does not occur in

patients with darkly pigmented skin. The Task Force on the Implications for Darkly Pigmented Intact Skin in the Prediction and Prevention of Pressure Ulcers (Bennett, 1995) defined **darkly pigmented skin** as skin that “remains unchanged (does not blanch) when pressure is applied over a bony prominence, irrespective of the patient’s race or ethnicity.” Characteristics of intact dark skin that will alert you to the potential for pressure ulcers are found in Box 46-2.

Pressure Duration. Two considerations are related to duration of pressure. Low pressures over a prolonged time period and high-intensity pressure over a short period of time both cause tissue damage. Extended pressure occludes blood flow and nutrients and contributes to cell death (Pieper, 2007). Clinical implications of pressure duration include evaluating the amount of pressure (check the skin for reactive hyperemia) and the amount of time that a patient tolerates pressure (check to be sure that after removing pressure, the affected area blanches).

Tissue Tolerance. The ability of tissue to endure pressure depends on the integrity of both the tissue and supporting

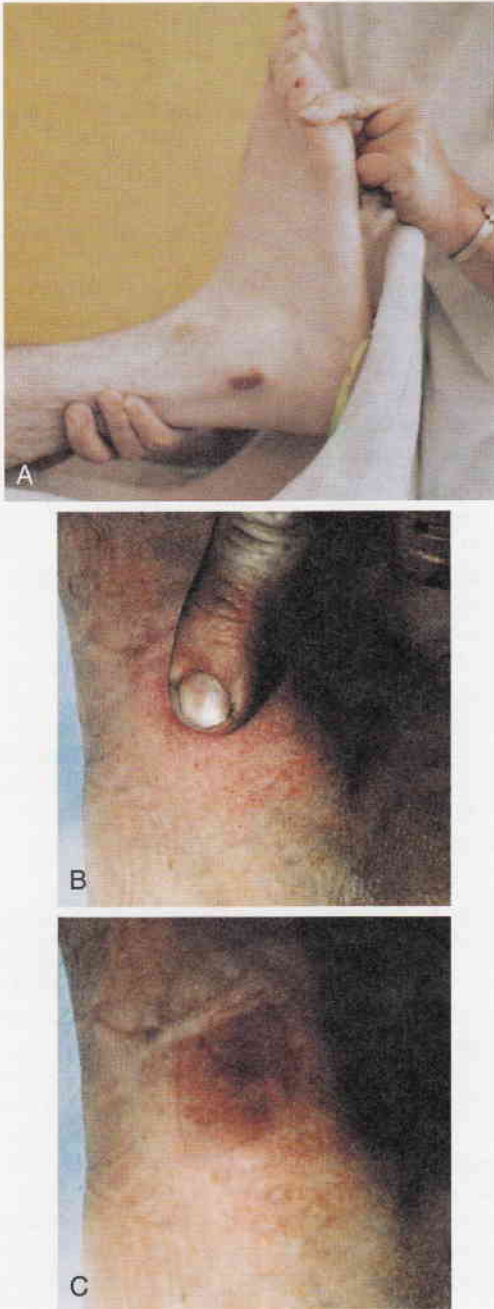


Figure 46-4 A, Reactive hyperemia. B and C, In nonblanching erythema, the area is much darker than the surrounding skin and does not blanch with fingertip pressure. **Source:** Pires, M., & Muller, A. (1991). Detection and management of early tissue pressure indicators: A pictorial essay. *Progressions*, 3(3), 3.

structures. The extrinsic factors of shear, friction, and moisture affect the ability of the skin to tolerate pressure: the greater the degree to which these factors are present, the more susceptible the skin will be to damage from pressure. Another factor related to tissue tolerance pertains to the ability of the underlying skin structures (blood vessels, collagen) to assist in redistributing pressure. Systemic factors such as poor nutrition, age, and low blood pressure affect tissue tolerance to externally applied pressure.

► BOX 46-2

Characteristics of Dark Skin at Risk of Skin Breakdown

A natural or halogen light source is best for assessing skin. Avoid fluorescent light sources because they cast a bluish hue, making accurate assessment difficult.

Colour

Appears darker than surrounding skin
Has purplish or bluish hue

Temperature

Initial warmth when compared with surrounding skin
Later coolness as tissue is devitalized

Touch

Indurated
Edema
Soft, boggy

Appearance

Taut
Shiny
Scaly

Source: Adapted from Bennett, M. A. (1995). Report of the task force on the implications for darkly pigmented intact skin in the prediction and prevention of pressure ulcers. *Advances in Wound Care*, 8(6), 34.

Nursing Knowledge Base

Prediction and Prevention of Pressure Ulcers

A major aspect of nursing care is the maintenance of skin integrity. Consistent, planned skin care interventions are critical to ensuring high-quality care. You need to take every opportunity to observe and assess your patients' skin for impaired skin integrity.

Risk Factors for Pressure Ulcer Development.

A variety of factors predisposes a patient to pressure ulcer formation. These factors are often directly related to disease, such as a decreased level of consciousness, the after-effects of trauma, or the presence of a cast, or are secondary to an illness, such as decreased sensation after a cerebrovascular accident.

The use of a pressure ulcer risk assessment tool, such as the Braden Risk Assessment Tool (described later in Table 46-2), provides an initial assessment to determine appropriate interventions and ongoing regular assessment to evaluate skin status and treatment efficacy.

Impaired Sensory Perception. Patients with altered sensory perception of pain and pressure are at more risk of impaired skin integrity than are patients with normal sensation. Patients with impaired sensory perception of pain and pressure may not feel increased, prolonged pressure or pain and are at high risk of developing pressure ulcers (Skill 46-1).

Impaired Mobility. Patients unable to independently change positions are at risk of pressure ulcer development. For example, patients with spinal cord injuries have decreased or absent motor and sensory perception and are unable to reposition themselves.

Alteration in Level of Consciousness. Patients who are confused or disoriented or with changing levels of consciousness may not be able to understand the sensation of pressure and respond by repositioning independently. As well, they may not be able to communicate discomfort or pain. Patients in a coma cannot perceive pressure and are unable to move voluntarily to relieve pressure.

Shear. Shear is the force exerted parallel to the skin and results from both gravity pushing down on the body and

► SKILL 46-1 Assessment for Risk of Pressure Ulcer Development



Delegation Considerations

Assessment of patients for risk of pressure ulcers should not be delegated to unregulated care providers (UCPs); however, prevention strategies should be included in their work plan. Check with your institution's policy in this regard.

Prevention

- Document changes to patient's skin, such as redness, blistering, abrasions, or cuts.
- Keep patient's skin dry: cleanse well after incontinence (urine or stool) or exposure to other body fluids.
- Reposition patient according to frequency established in nursing care plan or agency policy.
- Avoid trauma to patient's skin from tape, pressure, friction, or shear.

Equipment

- Use a risk assessment tool: Braden Scale (used in this skill) or other tool, according to agency policy.
- Documentation record

Procedure

STEPS

1. Identify at-risk individuals needing prevention and specific risk factors.
 - A. Use a validated risk assessment tool (e.g., the Braden Scale).
 - B. Assess the patient on admission to hospital, long-term care facility, home care program, or other health care facility.
 - C. Inspect the condition of the patient's skin at least once a day (see Box 46-4) and examine all bony prominences, noting skin integrity. (Check agency policy for reassessment and reassess at periodic intervals.) If redness or discoloration is noted, palpate area of redness for blanchable erythema.

RATIONALE

- Identification determines factors that increase the patient's risk of developing pressure ulcers (Braden, 2001).
- Consistent, reliable, comparable assessments are ensured (AHCPR, 1992a, 1992b; NPUAP, 2007a, 2007b; RNAO, 2007).
- A baseline assessment is provided.
- Routine skin assessments will identify changes in patient's risk of pressure ulcers.
- Nonblanchable erythema or discoloration in the patient's skin may be an early indicator of skin injury (Pieper, 2007).

Critical Decision Point: In dark-skinned patients, the discoloration appears as a deepening of the normal colour (see Box 46-2). Darkly pigmented skin does not always show direct changes in colour (Bennett, 1995; NPUAP, 1998).

- D. Observe all assistive devices, such as braces or casts, and medical equipment, such as nasogastric and enteral tubes and catheters, for pressure points.
2. Determine patient's ability to respond meaningfully to pressure-related discomfort (sensory perception).
 - Presence of medical equipment may cause pressure and skin breakdown in sensitive regions, such as nostrils, ears, or other bony prominences.
 - Patients with completely, very, or slightly limited ability to respond to pressure-related discomfort cannot communicate discomfort, will have a limited ability to feel pain, and, thus, risk developing pressure ulcers.
 3. Assess the degree to which patient's skin is exposed to moisture.
 - Exposure to excessive moisture increases the risk of skin breakdown due to changes in skin pH and maceration of skin.
 4. Evaluate the patient's activity level.
 - A. Determine patient's ability to change and control body position (mobility).
 - B. Determine patient's preferred positions.
 - The patient who is bedfast, chairfast, or only walks occasionally limits repositioning and pressure off-loading due to physical inactivity.
 - Potential for friction and shear injury increases when the patient is completely dependent on others for position change.
 - Habitual positioning (e.g., lying on one side or the other) may result in skin breakdown as the patient may resist repositioning to different areas.
 - A patient who never eats a complete meal, rarely eats a complete meal, or has limited fluid intake is at risk of skin breakdown.
 5. Assess patient's usual food and fluid intake pattern (nutrition and hydration).
 - A. Review weight pattern and nutritional laboratory values.
 - B. Complete a fluid intake assessment.
 - Decreased nutritional status is linked with pressure ulcer formation and poor wound healing (AHCPR, 1994; RNAO, 2007).
 - Fluid imbalance, either dehydration or edema, can increase the patient's risk of pressure ulcers.
 6. Evaluate the presence of friction and shear.
 - The patient who has spastic limbs, requires maximum assistance in moving, or slides against sheets when moved is at an increased risk of skin damage.
 7. Document the risk assessment on admission, on a regular basis according to institutional policy, and if any change in status occurs (Sibbald, Orsted, et al., 2006).
 - The documentation provides a baseline to track risk of development of pressure ulcers and allow planning of interventions.

► SKILL 46-1 Assessment for Risk of Pressure Ulcer Development—cont'd



- A. Observe the Braden Scale scores: as they become lower, predicted risk becomes higher.
Existing skin breakdown increases the risk by one level.
- B. Link the risk assessment to preventive protocols.
- C. Institute mild-risk interventions (score of 15–16). Plan of care should include frequent turning; maximum remobilization; off-load heel pressure; use of pressure-reducing support surface; manage moisture, nutrition, and friction and shear.
- D. Institute moderate-risk interventions (score of 13–14). Plan of care should include interventions for mild risk (step 7c), as well as use of foam wedges to position the patient in the 30-degree lateral position.
- E. Institute high-risk interventions (score of 10–12). Plan of care should include interventions for moderate risk (step 7d), as well as instructions to turn the patient with small shifts in weight.
- F. Institute very high-risk interventions (score <10). Plan of care should include interventions for high risk (step 7e) as well as use of a pressure-relieving surface, which still requires frequent repositioning of patient.
- 8. Provide education to patient and family regarding pressure ulcer risk.
- 9. Evaluate measures to reduce pressure ulcer development.
 - A. Observe patient's skin for areas at risk.
 - B. Observe tolerance of patient for positioning.
 - C. Monitor the success of a toileting program or other measures to reduce the frequency of incontinence of urine or stool.
 - D. Evaluate laboratory nutrition values.
- Scores:
 - 15–16, mild risk
 - 13–14, moderate risk
 - 10–12, high risk
 - <10, very high risk
- Existing skin breakdown indicates risk factors are already present and require attention.
- Prevention protocols will target problem areas to assist in prevention of skin breakdown (Braden, 2001).
- The risk of skin breakdown is decreased.
- The increased risk of skin breakdown is decreased with appropriate interventions.
- The factors that contribute to skin breakdown are identified, and appropriate interventions are planned.
- Plan interventions to decrease the effects of immobility, decreased sensory perception, moisture, friction, shear, decreased activity, and nutritional issues in a high-risk individual.
- Patient and family understand and participate as much as possible in the interventions designed to reduce pressure ulcer risk.
- Evaluation on a regular basis provides opportunity to assess and adjust interventions.
- Patient's response to risk-reduction interventions is determined over time.
- Frequent change in position further reduces patient's risk of pressure ulcer development.
- Avoiding moisture from urine or stool on patient's skin reduces risk of skin breakdown.
- Value of nutritional supplements in improving nutritional status is determined.

Unexpected Outcomes

No blanching when skin is firmly pressed, purple discoloration, or significant colour change

Related Interventions

- Reassess frequency of turning schedule.
- Implement agency's skin care protocols.
- Consider support surface to reduce pressure ulcer risk.

Recording and Reporting

- Record patient's risk score and sub-scores.
- Record appearance of skin (at pressure points, etc).
- Describe position, turning intervals, pressure-relieving devices, and other prevention strategies.
- Report any need for additional consultations (e.g., wound care specialist or dietitian) for the high-risk patient.

Home Care Considerations

- Instruct the caregiver to use the 30-degree lateral position. This position reduces pressure over the trochanter.
- Pressure-relief manoeuvres need to be individualized for patient needs and the home environment. Provide the family with resources to access equipment.

resistance (friction) between the patient and a surface (Pieper, 2007). For example, shear force occurs when the head of the bed is elevated and the skeleton starts to slide but the skin is fixed because of friction with the bed (Figure 46-5). In addition, shear force occurs when you transfer a patient from the bed to a stretcher and the patient's skin is pulled across the bed. When shear is present, the skin and subcutaneous layers

adhere to the surface of the bed, while layers of muscle and the bones slide in the direction of body movement. The underlying tissue capillaries are stretched and angulated by the shear force. As a result, necrosis occurs deep within the tissue layers, causing undermining of the dermis. Heels are particularly vulnerable to injury from shear as patients are often repositioned in bed without the heels being supported.

Friction. The force of two surfaces moving across one another, such as the mechanical force exerted when skin is dragged across a coarse surface such as bed linens, is called **friction** (Wound, Ostomy, and Continence Nurses [WOCN], 2010). Unlike shear injuries, friction injuries affect the epidermis, or top layer of the skin. The denuded skin appears red and painful and is sometimes referred to as a “sheet burn.” A friction injury occurs in a patient who is dragged over the bed surface instead of being lifted slightly during position changes.

Moisture. The presence and duration of moisture on the skin increases the risk of ulcer formation. Moisture reduces the skin’s resistance to other physical factors such as pressure and shear force. Prolonged moisture softens skin, which makes it

more susceptible to damage. Immobilized patients, who are unable to take care of their own hygiene needs, depend on you to keep their skin dry and intact. Skin moisture originates from wound drainage, excessive perspiration, and fecal or urinary incontinence.

Nutrition. Adequate nutritional intake is essential for not only wound healing but also wound prevention (Skipper, 2010). In particular, high-protein oral nutritional supplementation is necessary in patients whose prealbumin or albumin, hemoglobin, and serum zinc stores are low (RNAO, 2011).

For patients weakened or debilitated by illness, nutritional therapy is especially important. A patient who has undergone surgery (see Chapter 48) and is well nourished still requires at least 1500 kcal/day for nutritional maintenance. Alternatives such as enteral feedings and parenteral nutrition (see Chapter 42) are available for patients unable to maintain normal food intake.

Normal wound healing requires proper nutrition (Table 46-1). Deficiencies in any of the nutrients result in impaired or delayed healing (Stotts, 2007a). Physiological processes of wound healing depend on availability of protein, vitamins (especially A and C), and trace minerals: zinc and copper. **Collagen** is a protein formed from amino acids acquired by fibroblasts from protein ingested in food. Vitamin C is necessary for the synthesis of collagen, and vitamin A reduces the negative effects of steroids on wound healing. Trace elements such as zinc (used for epithelialization and collagen synthesis) and copper (for collagen fibre linking) are also necessary.

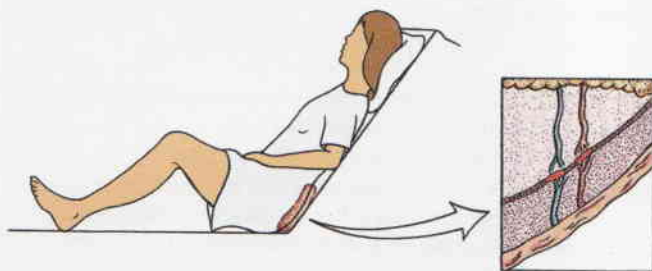


Figure 46-5 Sketch of shear force exerted against the sacral area.

► TABLE 46-1 Role of Selected Nutrients in Wound Healing

Nutrient	Role in Healing	Recommendations	Sources
Calories	Fuel for cell energy “protein protection”	35–40 kcal/kg/day, or enough to maintain positive nitrogen balance	
Protein	Fibroplasia, angiogenesis, collagen formation, and wound remodelling, immune function	1.0–1.5 g/kg/day, or enough to maintain positive nitrogen balance	Poultry, fish, eggs, beef
Vitamin C (ascorbic acid)	Collagen synthesis, capillary wall integrity, fibroblast function, immunological function, antioxidant	100–1000 mg/day Need long time before clinical scurvy from vitamin C deficiency develops Low toxicity	Citrus fruits, tomatoes, potatoes, fortified fruit juices
Vitamin A	Epithelialization, wound closure, inflammatory response, angiogenesis, collagen formation Can reverse steroid effects on skin and delayed healing	1600–2000 retinol equivalents per day Supplement if deficient 20,000 units × 10 days	Green leafy vegetables (spinach), broccoli, carrots, sweet potatoes, liver
Vitamin E	No known role in wound healing, antioxidant	None	Fish, oysters, liver, dark meat, eggs, legumes
Zinc	Collagen formation, protein synthesis, cell membrane and host defences	15–30 mg Correct deficiencies No improvement in wound healing with supplementation unless zinc deficient Use with caution: large doses can be toxic May inhibit copper metabolism and impair immune function	Vegetables, meats, legumes
Fluid	Essential fluid environment for all cell function	30–35 mL/kg/day Increase by another 10–15 mL/kg if patient is on an air-fluidized bed	Use noncaffeine, nonalcoholic fluids without sugar Water is best: 6–8 glasses/day

Adapted from Ayello, E. A., Thomas, D. R., & Litchford, M. A. (1999). Nutritional aspects of wound healing. *Home Health Nurse*, 17(11), 719; and Stotts, N. A. (2007). Nutritional assessment and support. In R. A. Bryant & D. P. Nix (Eds.), *Acute and chronic wounds: Current management concepts* (3rd ed.). St Louis, MO: Mosby.

Calories provide the energy to support wound healing. Protein needs, especially, are increased. A balanced nutrient intake is critical for wound healing, including protein, fat, carbohydrates, vitamins, and minerals. Serum proteins are biochemical indicators of malnutrition (Stotts, 2007a). Although serum albumin is the most frequently measured of these laboratory parameters, it is not sensitive to rapid changes in nutritional status. The best measure of nutritional status is pre-albumin because it reflects not only what the patient has ingested but also what the body has absorbed, digested, and metabolized (Stotts, 2007a).

Tissue Perfusion. Oxygen fuels the cellular functions essential to the healing process; therefore, the ability to perfuse the tissues with adequate amounts of oxygenated blood is critical to wound healing (Doughty & Sparks-Defriese, 2007). Patients with shock or peripheral vascular diseases, such as diabetes, are at risk of poor tissue perfusion due to poor circulation. Oxygen requirements depend on the phase of wound healing; for instance, chronic tissue hypoxia is associated with impaired collagen synthesis and reduced tissue resistance to infection.

Infection. Wound infection prolongs the inflammatory phase, delays collagen synthesis, prevents epithelialization, and increases the production of proinflammatory cytokines, which leads to additional tissue destruction (Stotts, 2007b). Indications that a wound infection is present are the presence of pus; a change in odour, volume, or the character of wound drainage; redness in the surrounding tissue; fever; or pain (Box 46-3).

Pain. Uncontrolled pain can affect the patient's ability to tolerate movement and can decrease tissue perfusion because of rapid, shallow breathing and tensed muscles. In addition, the patient's appetite may be diminished because of nausea from pain, and if the restorative powers of sleep are not accessible, the individual may feel hopeless and depressed from the unrelenting nature of both the wound and the persistent pain (Kohr & Gibson, 2008).

Age. Physiological changes occur with aging. These changes will affect the healing trajectory of a wound. For example, decrease in the functioning of macrophages leads to a delayed inflammatory response, delayed collagen synthesis, and slower epithelialization.

► BOX 46-3 Classic Signs of Wound Infection

- Pain and tenderness at the wound site
- Erythema (reddening of the surrounding tissue)
- Edema (swelling), **induration** (increased firmness of the tissue)
- Inflammation of wound edges
- Purulent discharge
- Warmth in surrounding tissue
- Fever, chills
- Foul odour
- Elevated white blood cell count
- Delayed healing

Chronic Wounds

The above signs and symptoms as well as the following:

- Increased exudates
- Bright red discolouration of granulation tissue
- New areas of slough or breakdown on the wound surface
- Undermining (dead space under the edges of the wound)

Psychosocial Impact of Wounds. The patient's psychological response to any wound is part of your assessment. Body-image changes often impose a great stress on the patient's adaptive mechanisms. In addition, body-image changes influence self-concept (see Chapter 25) and sexuality (see Chapter 26). Make sure the patient's personal and social resources for adaptation are a part of the assessment. Factors that affect the patient's perception of the wound include the presence of scars, drains (drains are often necessary for weeks or even months after certain procedures), odour from drainage, and temporary or permanent prosthetic devices.

Critical Thinking

Successful critical thinking requires a synthesis of knowledge, experience, information gathered from patients, critical thinking attitudes, and intellectual and professional standards. Clinical judgement means you need to anticipate the information necessary, analyze the data, and make decisions regarding patient care. Critical thinking is always changing. During assessment, consider all elements that build toward making appropriate nursing diagnoses (Figure 46-6).

When caring for patients who have impaired skin integrity and chronic wounds, you must integrate knowledge from nursing and other disciplines, previous experiences, and information gathered from patients to understand the risks to skin integrity and wound healing. Knowledge of normal musculoskeletal physiology, the pathogenesis of pressure ulcers, normal wound healing, and the pathophysiology of underlying diseases provides you with a scientific basis for care. The CAWC (2006) and the RNAO (2011) provide evidence-derived guidelines for assessment of the risk of impaired skin integrity, prevention measures, and interventions to promote wound healing, as well as other standards of practice that you should use in planning care. Past experience with patients at risk of impaired skin integrity or with patients with wounds increases the experiential knowledge base helping you to identify interventions.

Finally, you need to ensure that you remain attentive during assessment to obtain comprehensive and correct assessment data. As identified previously, a *continuum* exists to wound healing that implies change over time. You need to be aware that the patient and the skin or wound condition will not remain static, so you should reassess on a regular basis and adjust your plan of care accordingly. Knowledge and experience regarding wound healing will assist you in taking advantage of all the available and appropriate treatment options.

Assessment for tissue pressure damage involves visual and tactile inspection of the skin. Your baseline assessment will determine the patient's normal skin characteristics and any potential or actual areas of breakdown. You need to take into account the specific characteristics of the patient's skin, including pigmentation, effects of aging or medication, etc. (Bennett, 1995; Henderson et al., 1997). Assessment characteristics of darkly pigmented skin appear in Boxes 46-2 and 46-5.

Pay particular attention to areas located over bony prominences or under casts, traction, splints, braces, collars, or other orthopedic devices. The frequency of pressure checks depends on the schedule of appliance application and the skin's response to the external pressure (Figure 46-7).

When you note hyperemia, document the location, size, and colour and reassess the area after one hour (Figure 46-8, A). When you suspect abnormal reactive hyperemia, outline the affected area with a marker to make reassessment easier. These

Knowledge

- Pathogenesis of pressure ulcers
- Factors contributing to pressure ulcer formation or poor wound healing
- Factors contributing to wound healing
- Impact of underlying disease process on skin integrity
- Impact of medication on skin integrity and wound healing

Experience

- Caring for patients with impaired skin integrity or wounds
- Observation of normal wound healing

Assessment

- Identify the patient's risk for developing impaired skin integrity
- Identify signs and symptoms associated with impaired skin integrity or poor wound healing
- Examine patient's skin for actual impairment in skin integrity

Standards

- Apply intellectual standards of accuracy, relevance, completeness, and precision when obtaining health history regarding skin integrity and wound management
- Knowledge of AHRQ (AHCPR, 1992a) standards for prevention of pressure ulcers
- Knowledge of standards for assessment of risk for impaired skin integrity and prevention

Qualities

- Use discipline to obtain complete and correct assessment data regarding patient's skin or wound integrity
- Demonstrate responsibility for collecting appropriate specimens for diagnostic and laboratory tests related to wound management

Figure 46-6 Critical thinking for skin integrity and wound care assessment.

signs are early indicators of impaired skin integrity, but damage to the underlying tissue is sometimes more progressive (Figure 46-8, B). Palpation with your fingertips will help you assess and identify induration or other damage to skin and underlying tissues.

Gently palpate the reddened tissue, observing for blanching as normal skin tones return in patients with light-toned skin. In addition, palpate for induration, noting size in millimetres or centimetres of the induration around the injured area. Also note changes in the temperature of the surrounding skin and tissues.

Use visual and tactile inspection over the body areas most frequently at risk of pressure ulcer development (see Figure 46-2).

Nursing Process

◆ Assessment

Skin integrity is subject to change over time. Baseline and continual assessment data support critical information about



Figure 46-7 A pressure ulcer on the heel caused by pressure exerted by the mattress.

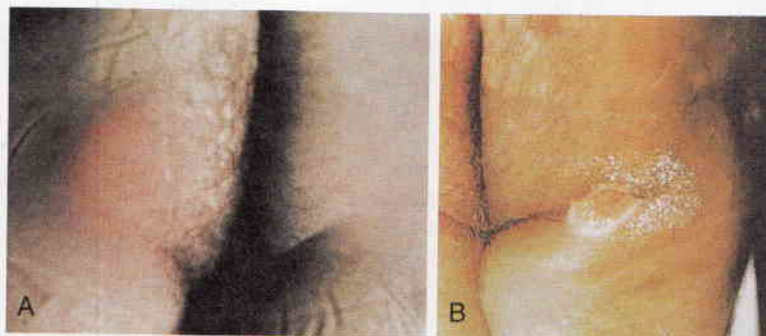


Figure 46-8 A, Hyperemia on ischial tuberosity. B, Ulcer. **Source:** Pires, M., & Muller, A. (1991). Decision and management of early tissue pressure indicators: A pictorial essay. *Progressions*, 3(3), 3.

► BOX 46-4 Nursing Assessment Questions

Skin Integrity

Sensation

- Do you have any loss of feeling in your feet or legs or anywhere else?
- Do you feel more (or less) sensitive to heat or cold?

Mobility

- Do you have any physical conditions, injury, or paralysis that limits your mobility?
- Can you easily change your position?
- Is it painful to move?

Continence

- Do you have any problems with urine or bowel continence?
- Do you need help when you use the toilet?
- How often do you need to use the toilet? During the day? During the night?

Presence of a Wound

- How did this wound happen?
- When did the wound occur?
- When did you last receive a tetanus shot?
- What happened to this wound since it occurred? Is it getting better? Or worse?
- What treatments, activities, or care have slowed or helped the wound healing process? Are there other things we could be doing to improve things?
- Is the wound painful? If so, can you describe the pain (burning, stabbing, sharp, dull, etc.) or is it itchy? What have you been doing to manage this? Is it working?
- What would you like, in terms of the goal for yourself, in relation to this wound and its healing?

the patient's skin integrity and the increased risk of pressure ulcer development. The specific factors, such as continence status or mobility, help focus your assessment (Box 46-4).

Skin

You should ensure that ongoing assessment occurs to guard against skin breakdown, and you should treat any tears or ulcers promptly (Box 46-5). The neurologically impaired patient, the chronically ill patient in long-term care, the patient with diminished mental status, and patients in the intensive care unit (ICU) or oncology, hospice, or orthopedic departments all have an increased potential of developing pressure ulcers.

Risk Assessment

By identifying and promptly treating at-risk patients, you can spare patients with little risk of pressure ulcer development the unnecessary and sometimes costly preventive treatments and related risks of complications. Prevention and treatment of pressure ulcers are major nursing priorities, no matter what the health care setting. Evidence exists that a program of prevention guided by consistent risk assessment simultaneously reduces the institutional incidence of pressure ulcers by as much as 60% and decreases the costs of prevention at the same time (Braden, 2001). The Braden Pressure Ulcer Risk Assessment Scale has been identified by the CAWC and the RNAO Best Practice Guidelines as a reliable and valid risk assessment

* BOX 46-5 CULTURAL ASPECTS OF CARE

Skin Colour Impact

Your ability to detect cyanosis and other changes in skin colour in patients is an important clinical skill. However, this detection becomes a challenge in dark-skinned patients. Cyanosis is “a slightly bluish greyish slate-like or dark purple discolouration of the skin due to the presence of at least 5 grams of reduced hemoglobin in arterial blood.” Colour differentiation of cyanosis varies according to skin pigmentation. In dark-skinned patients, you need to know the individual's baseline skin tone. You should not confuse the normal hyperpigmentation of Mongolian spots that are seen on the sacrum of African, Native American, and Asian patients as cyanosis. Observe the patient's skin in nonglare daylight. The Gaskin's Nursing Assessment of Skin Colour (GNASC) is a useful assessment tool for identifying changes in skin colour that increase the patient's risk of pressure ulcers.



Implications for Practice

- Cyanosis is difficult but possible to detect in the dark-skinned patient.
- Be aware of situations that produce changes in skin tone, such as inadequate lighting.
- Examine body sites with the least melanin, such as under the arm, for underlying colour identification.
- Evaluate pigmented skin for colour-specific changes in skin tone.

Sources: Adapted from Gaskin, F. C. (1986). Detection of cyanosis in the person with dark skin. *Journal of National Black Nurses' Association*, 1, 52; and Henderson, C. T., Ayello, E. A., Sussman, C., Leiby, D. M., Bennet, M. A., Dungog, E. F., Sprigle, S., & Woodruff, L. (1997). Draft definition of stage I pressure ulcers: Inclusion of persons with darkly pigmented skin. *Advances in Wound Care*, 10(5), 16.

tool across all health care sectors and is the most commonly used (RNAO, 2011; Keast et al., 2006). However, an assessment tool is exactly that, a tool to assist you in planning intervention strategies and evaluation of your patient's skin on an ongoing basis. No assessment tool can replace your clinical judgement as a nurse (RNAO, 2011).

Braden Scale

The Braden Scale (Table 46-2) was developed based on risk factors in a nursing home population (Bergstrom et al., 1987). The Braden Scale comprises six subscales: sensory perception, moisture, activity, mobility, nutrition, and friction and shear. The total score ranges from 6 to 23, and a lower total score indicates a higher risk of pressure ulcer development (Braden & Bergstrom, 1989). The cutoff score for onset of pressure ulcer risk with the Braden Scale in the general adult population is 18 (Ayello & Braden, 2002). The Braden Scale is highly reliable when you use it to identify patients at greatest risk of pressure ulcers (Braden & Bergstrom, 1994; Bergstrom et al., 1987; Keast et al., 2006).

Case Example. Your patient is Mrs. Hetje Lamont, an 85-year-old widow with a recent left-sided stroke who lives alone and who has been admitted to your acute care medical floor. She has obvious slurred speech and some facial drooping; her left arm is flaccid and she tells you she “can't feel it at all.” She has been incontinent of urine since the stroke and is wearing an adult continence product. She seems alert (oriented

► **TABLE 46-2** Braden Scale for Predicting Pressure Sore Risk

Patient's Name _____		Evaluator's Name _____		Date of Assessment _____	
Characteristic	Score: 1	Score: 2	Score: 3	Score: 4	
Sensory Perception					
Ability to respond meaningfully to pressure-related discomfort	1. Completely limited Unresponsive (does not moan, flinch, or gasp) to painful stimuli due to diminished level of consciousness or sedation. OR Limited ability to feel pain over most of body surface.	2. Very limited Responds only to painful stimuli. Cannot communicate discomfort except by moaning or restlessness. OR Has a sensory impairment that limits the ability to feel pain or discomfort over half of body.	3. Slightly limited Responds to verbal commands but cannot always communicate discomfort or need to be turned. OR Has some sensory impairment that limits ability to feel pain or discomfort in 1 or 2 extremities.	4. No impairment Responds to verbal commands. Has no sensory deficit that would limit ability to feel or voice pain or discomfort.	
Moisture					
Degree to which skin is exposed to moisture	1. Constantly moist Skin is kept moist almost constantly by perspiration, urine, etc. Dampness is detected every time patient is moved or turned.	2. Moist Skin is often, but not always, moist. Linen must be changed at least once a shift.	3. Occasionally moist Skin is occasionally moist, requiring an extra linen change approximately once a day.	4. Rarely moist Skin is usually dry. Linen only requires changing at routine intervals.	
Activity					
Degree of physical activity	1. Bedfast Confined to bed.	2. Chairfast Ability to walk severely limited or nonexistent. Cannot bear own weight or must be assisted into chair or wheelchair.	3. Walks occasionally Walks occasionally during day but for very short distances, with or without assistance. Spends majority of each shift in bed or chair.	4. Walks frequently Walks outside the room at least twice a day and inside room at least once every two hours during waking hours.	
Mobility					
Ability to change and control body position	1. Completely immobile Does not make even slight changes in body or extremity position without assistance.	2. Very limited Makes occasional slight changes in body or extremity position but unable to make frequent or significant changes independently.	3. Slightly limited Makes frequent though slight changes in body or extremity position independently.	4. No limitations Makes major and frequent changes in position without assistance.	
Nutrition					
Usual food intake pattern	1. Very poor Never eats a complete meal. Rarely eats more than one-third of any food offered. Eats two servings or less of protein (meat or dairy products) per day. Takes fluids poorly. Does not take a liquid dietary supplement. OR Is NPO or maintained on clear liquids or IVs for more than five days.	2. Probably inadequate Rarely eats a complete meal and generally eats only about half of any food offered. Protein intake includes only three servings of meat or dairy products per day. Occasionally will take a dietary supplement. OR Receives less than optimum amount of liquid diet or tube feeding.	3. Adequate Eats over half of most meals. Eats a total of four servings of protein (meat, dairy products) each day. Occasionally will refuse a meal but will usually take a supplement if offered. OR Is on a tube feeding or total parenteral nutrition regimen that probably meets most nutritional needs.	4. Excellent Eats most of every meal. Never refuses a meal. Usually eats a total of four or more servings of meat and dairy products. Occasionally eats between meals. Does not require supplementation.	

► TABLE 46-2 Braden Scale for Predicting Pressure Sore Risk—cont'd

Characteristic	Score: 1	Score: 2	Score: 3	Score: 4
Friction and Shear				
	1. Problem Requires moderate to maximum assistance in moving. Complete lifting without sliding against sheets is impossible. Frequently slides down in bed or chair, requiring frequent repositioning with maximum assistance. Spasticity, contractures, or agitation leads to almost constant friction.	2. Potential problem Moves feebly or requires minimum assistance. During a move, skin probably slides to some extent against sheets, chair, restraints, or other devices. Maintains relatively good position in chair or bed most of the time but occasionally slides down.	3. No apparent problem Moves in bed and in chair independently and has sufficient muscle strength to lift up completely during move. Maintains good position in bed or chair at all times.	
				TOTAL SCORE

NPO, Nothing by mouth.

Copyright © 1988. Used with permission of Barbara Braden, PhD, RN, Professor, Creighton University School of Nursing, Omaha, Nebraska; and Nancy Bergstrom, Professor, University of Texas-Houston, School of Nursing, Houston, Texas. Retrieved from <http://www.bradenscale.com>.

to time, place, person) but has been noted to be “a bit confused and weepy at times.” Her status has been nothing by mouth (NPO) for the past 48 hours, in preparation for a swallowing assessment. (She is currently receiving only IV normal saline.) Her daughter tells you that Mrs. Lamont “has been eating like a bird” for the past few weeks.

When you come to the bedside, she is lying on her right side and has difficulty moving without help. She is too weak to ambulate and needs assistance to sit in a chair.

Questions:

- What is her score on the Braden Risk Assessment Tool?
- From the subscore results, what interventions would be appropriate?
- How often would you reassess your patient for risk of skin breakdown?

Classification of Pressure Ulcers

You need to assess pressure ulcers at regular intervals using systematic variables to evaluate wound healing, plan appropriate interventions, and evaluate progress. One method you can use for assessment of a pressure ulcer is a staging system. Staging systems for pressure ulcers are based on your description of the depth of tissue destroyed. Accurate staging requires knowledge of the skin layers. A major drawback of a staging system is that you cannot stage an ulcer covered with necrotic tissue because the necrotic tissue is covering the depth of the ulcer (Figure 46-9). The necrotic tissue must be debrided or removed to expose the wound base to allow for assessment.

The National Pressure Ulcer Advisory Panel (NPUAP) (2007a) has proposed a four-stage classification system with an additional deep tissue injury (DTI) descriptor (Table 46-3). Pressure ulcer staging describes the pressure ulcer depth at the point of assessment. Thus, once you have staged the pressure ulcer, this stage endures even as the pressure ulcer heals. Pressure ulcers do not progress from a stage III to a stage I; rather a stage III ulcer demonstrating signs of healing is described as a healing stage III pressure ulcer (Nix, 2007). In 2007, the NPUAP redefined the definition of a pressure ulcer and the



Figure 46-9 Pressure ulcer with tissue necrosis.

stages of pressure ulcers, including the original four stages, by adding two stages on deep tissue injury and unstageable pressure ulcers (Box 46-6).

In addition, Bennett (1995) suggested that when you assess patients with darkly pigmented skin, proper lighting is important to accurately assess the skin (see Box 46-2). Either natural light or a halogen light is recommended. This prevents the blue tones that fluorescent light sources produce on darkly pigmented skin, which interfere with accurate assessment.

For a wound with **nonviable tissue**, you will need to include the amount (percentage) and appearance (colour) of viable and nonviable tissue. This will assist you in developing the appropriate plan of care based on the healing ability of the wound.

Granulation tissue is red, moist tissue composed of new blood vessels, the presence of which indicates progression toward healing. Soft yellow or white tissue is characteristic of **slough** (a stringy substance attached to the wound bed), and you will need to remove this before the wound is able to heal. Black or brown necrotic tissue is **eschar**, which will also need to be removed before healing can proceed. Remember, sharp debridement of a wound, to remove nonviable tissue, can be performed only by a nurse who has the appropriate

knowledge, skill, and clinical judgement and agency or institution policy and procedure in place.

The measurement of the size of the wound provides overall changes in size, which is an indicator for wound healing progress (Nix, 2007). Consistent measurement of length times width using a disposable ruler is the best way to ensure appropriate documentation of the progress of wound healing over

time (Langemo et al., 2008). Obtain depth by using a sterile cotton-tipped applicator to gently probe for tunnelling and undermining in the wound bed.

Wound **exudate** describes the amount, colour, consistency, and odour of wound drainage and is part of the wound assessment. Excessive exudate usually indicates presence of an infection. You should also evaluate the condition of the skin

► **TABLE 46-3** Guidelines for Staging Pressure Ulcers

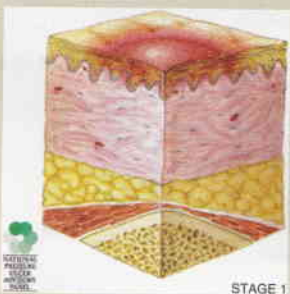
The following criteria can be used as a visual aid to help identify and appropriately stage pressure ulcers. The definitions were derived from work done by the National Pressure Ulcer Advisory Panel and published in February 2007.

Suspected Deep Tissue Injury



Purple or maroon localized area of discoloured intact skin or blood-filled blister due to damage of underlying soft tissue from pressure or shear or both. The area may be preceded by tissue that is painful, firm, mushy, boggy, warmer or cooler as compared to adjacent tissue.

Stage I



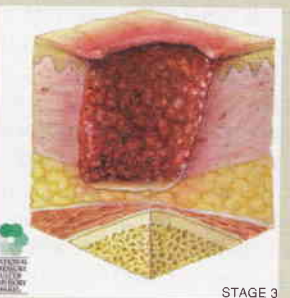
Intact skin with nonblanchable redness of a localized area usually over a bony prominence. Darkly pigmented skin may not have visible blanching; its colour may differ from the surrounding area.

Stage II



Partial thickness loss of dermis presenting as a shallow open ulcer with a red pink wound bed, without slough. May also present as an intact or an open or ruptured serum-filled blister.

Stage III

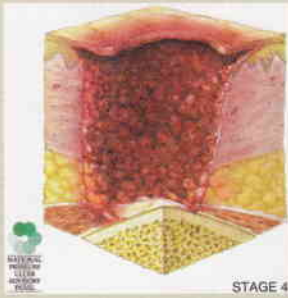


Full thickness tissue loss. Subcutaneous fat may be visible, but bone, tendon, or muscle are not exposed. Slough may be present but does not obscure the depth of tissue loss. May include undermining and tunnelling.

Continued

► **TABLE 46-3** Guidelines for Staging Pressure Ulcers—cont'd

Stage IV



Full thickness tissue loss with exposed bone, tendon, or muscle. Slough or eschar may be present on some parts of the wound bed. Often includes undermining and tunnelling.

Unstageable



Full thickness tissue loss in which the base of the ulcer is covered by slough (yellow, tan, grey, green, or brown) or eschar (tan, brown, or black), or both, in the wound bed.

► **BOX 46-6** National Pressure Ulcer Advisory Panel Staging Guidelines

Suspected Deep Tissue Injury

Please refer to Table 46-3 for a description of a suspected deep tissue injury.

Further Description

Deep tissue injury may be difficult to detect in individuals with dark skin tones. Evolution may include a thin blister over a dark wound bed. The wound may further evolve and become covered by thin eschar. Evolution may be rapid, exposing additional layers of tissue, even with optimal treatment.

Stage I

Please refer to Table 46-3 for a description of a stage I pressure ulcer.

Further Description

The area may be painful, firm, soft, warmer, or cooler as compared with adjacent tissue. Stage I may be difficult to detect in individuals with dark skin tones. The stage may indicate “at-risk” persons (a heralding sign of risk).

Stage II

Please refer to Table 46-3 for a description of a stage II pressure ulcer.

Further Description

The stage presents as a shiny or dry shallow ulcer without slough or bruising.* This stage should not be used to describe skin tears, tape burns, perineal dermatitis, maceration, or excoriation.

Stage III

Please refer to Table 46-3 for a description of a stage III pressure ulcer.

Further Description

The depth of a stage III pressure ulcer varies by anatomical location. The bridge of the nose, ear, occiput, and malleolus do not have subcutaneous tissue, and stage III ulcers can be shallow. In contrast, areas of significant adiposity can develop extremely deep stage III pressure ulcers. The bone or tendon is not visible or directly palpable.

Stage IV

Please see Table 46-3 for a description of a stage IV pressure ulcer.

Further Description

The depth of a stage IV pressure ulcer varies by anatomical location. The bridge of the nose, ear, occiput, and malleolus do not have subcutaneous tissue and these ulcers can be shallow. Stage IV ulcers can extend into muscle or supporting structures (e.g., fascia, tendon, or joint capsule), or both, making osteomyelitis possible. Exposed bone or tendon is visible or directly palpable.

Unstageable

Please refer to Table 46-3 for a description of an unstageable pressure ulcer.

Further Description

Until enough slough or eschar is removed to expose the base of the wound, the true depth, and, therefore, stage cannot be determined. Stable (dry, adherent, intact without erythema or fluctuance) eschar on the heels serves as “the body’s natural (biological) cover” and should not be removed. The staging system was defined by Shea in 1975 and provides a name to the amount of anatomical tissue loss. The original definitions were confusing to many clinicians and led to inaccurate staging of ulcers associated with or due to perineal dermatitis and those due to deep tissue injury.

*Bruising indicates suspected deep tissue injury.

Source: National Pressure Ulcer Advisory Panel. (2007). *Pressure ulcer definitions*. Retrieved from http://www.npuap.org/documents/NPUAP2007_PU_Def_and_Descriptions.pdf.

surrounding the wound for redness, warmth, maceration, or edema (swelling). The presence of any of these factors on the periwound skin indicates wound deterioration.

Wound Classifications

A **wound** is a disruption of the integrity and function of tissues in the body (Baharestani, 1994). It is imperative that you understand that *all wounds are not created equal*. Understanding the etiology of a wound is important because the treatment for the wound varies, depending on the underlying disease process. Some treatments are even harmful to certain wounds, so you always need to obtain a complete history, including the etiology of the wound.

You can classify wounds in many ways. Wound classification systems describe the status of skin integrity, cause of the wound, severity or extent of tissue injury or damage, cleanliness of the wound (Table 46-4), or descriptive qualities of wound tissue such as colour (Figure 46-10). Wound classifications enable you to understand the risks associated with a wound and implications for healing.

Process of Wound Healing

Wound healing involves integrated physiological processes. The tissue layers involved and their capacity for regeneration determine the mechanism for repair of any wound (Doughty & Sparks-Defriese, 2007). Two types of wounds are those with loss of tissue and those without. A clean surgical incision is an example of a wound with little tissue loss. The surgical wound heals by **primary intention**. The skin edges are **approximated**, or closed, and the risk of infection is low.

Healing occurs quickly, with minimal scar formation, as long as infection and secondary breakdown are prevented (Doughty & Sparks-Defriese, 2007). In contrast, a wound involving loss of tissue, such as a burn, pressure ulcer, or severe laceration, heals by **secondary intention**. The wound is left open until it becomes filled by scar tissue. It takes longer for a wound to heal by secondary intention; thus, the chance of infection is greater. If scarring from secondary intention is severe, loss of tissue function is often permanent (Figure 46-11).

Wound Repair

Partial-thickness wounds are shallow wounds involving loss of the epidermis (top layer) and possibly partial loss of the dermis. Epidermal wounds, such as a clean surgical wound or an abrasion, heal by regeneration. However, full-thickness wounds extending into the dermis (involving both layers of tissue) heal by scar formation because deeper structures do not regenerate. Pressure ulcers are an example of full-thickness wounds.

Partial-Thickness Wound Repair. Three components make up the healing process of a partial-thickness wound: inflammatory response, epithelial proliferation (reproduction) and migration, and re-establishment of the epidermal layers. Tissue trauma causes the *inflammatory response*, which, in turn, causes redness and swelling to the area, as well as a moderate amount of serous exudate. Normally, this response is limited to the first 24 hours after wounding. Epithelial cells begin to regenerate, providing new replacement cells. This *epithelial proliferation and migration* starts at the wound edges and the epidermal cells lining the epidermal appendages, allowing for quick resurfacing. Epithelial cells begin migrating across the wound bed soon after wounding. *A wound left open to air can resurface within six to seven days, whereas a wound that is kept*

► TABLE 46-4 Wound Classification

Description	Causes	Implications for Healing
Onset and Duration		
Acute		
A wound that proceeds through an orderly and timely reparative process that results in sustained restoration of anatomical and functional integrity.	Trauma, a surgical incision.	Wounds are usually easily cleaned and repaired. Wound edges are clean and intact.
Chronic		
Wound that fails to proceed through an orderly and timely process to produce anatomical and functional integrity.	Vascular compromise, chronic inflammation, or repetitive insults to the tissue (Doughty & Sparks-Defriese, 2007).	Continued exposure to insult impedes wound healing.
Healing Process		
Primary Intention		
Wound that is closed.	Surgical incision, wound that is sutured or stapled.	Healing occurs by epithelialization; heals quickly with minimal scar formation.
Secondary Intention		
Wound edges are not approximated.	Pressure ulcers, surgical wounds that have tissue loss.	Wound heals by granulation tissue formation, wound contraction, and epithelialization.
Tertiary Intention		
Wound is left open for several days, then wound edges are approximated.	Wounds that are contaminated and require observation for signs of inflammation.	Closure of wound is delayed until risk of infection is resolved (Doughty & Sparks-Defriese, 2007).

moist can resurface in four days. The difference in the healing rate is related to the fact that epidermal cells only migrate across a moist surface. In a dry wound, the cells migrate down into a moist level before migration can occur (Doughty & Sparks-Defriese, 2007). New epithelium is only a few cells thick and must undergo re-establishment of the epidermal layers. The cells slowly re-establish normal thickness and appear as dry pink tissue.

Full-Thickness Wound Repair. Inflammatory, proliferative, and remodelling phases are involved in the healing process of a full-thickness wound. Note the differences between partial and full-thickness wounds.

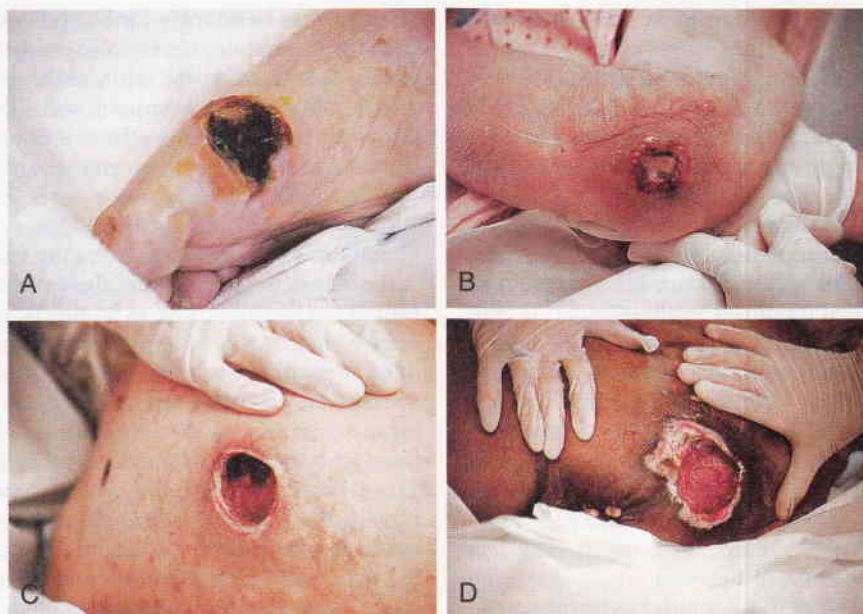


Figure 46-10 Wounds classified by colour assessment. **A**, Black wound. **B**, Yellow wound. **C**, Red wound. **D**, Mixed-colour wound. **Source:** Courtesy Scott Health Care—A Molnlycke Company, Philadelphia, PA.

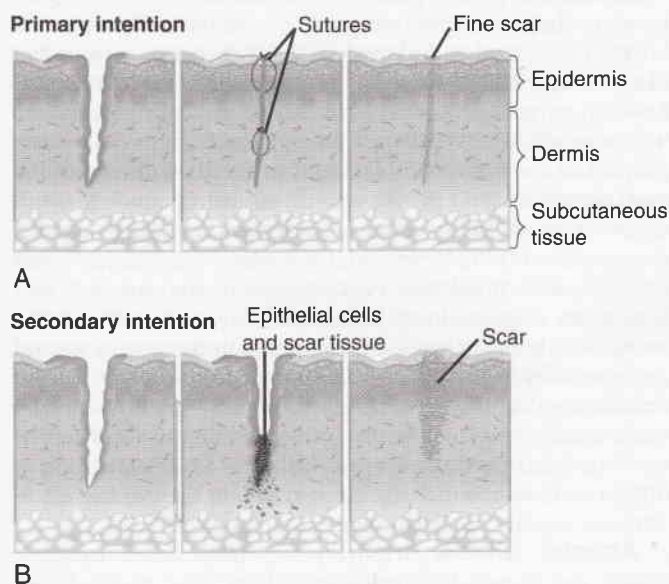


Figure 46-11 **A**, Wound healing by primary intention such as a surgical incision. Wound healing edges are pulled together and approximated with sutures or staples, and healing occurs by connective tissue deposition. **B**, Wound healing by secondary intention. Wound edges are not approximated, and healing occurs by granulation tissue formation and contraction of the wound edges. **Source:** Bryant, R. A., & Nix, D. P. (Eds.). (2007). *Acute and chronic wounds: Nursing management* (3rd ed.). St Louis, MO: Mosby. Used with permission.

Inflammatory Phase. The inflammation stage is the body's reaction to wounding, beginning within minutes of injury and, in full thickness wounds, lasts approximately three days. During **hemostasis**, injured blood vessels constrict, and platelets gather to stop bleeding. Clots form a **fibrin** matrix that later provides a framework for cellular repair. Damaged

tissue and mast cells secrete histamine, resulting in vasodilation of surrounding capillaries and exudation of serum and white blood cells into damaged tissues. This results in localized redness, edema, warmth, and throbbing. The inflammatory response is beneficial, and attempting to cool the area or reduce the swelling has no value unless the swelling occurs within a closed compartment (e.g., ankle or neck).

Leukocytes (white blood cells) reach the wound within a few hours. The primary white blood cell is the neutrophil, which begins to ingest bacteria and small debris. The second important leukocyte is the monocyte, which transforms into macrophages.

The macrophages are the "garbage cells" that clean a wound of bacteria, dead cells, and debris by phagocytosis. Macrophages continue the process of clearing the wound of debris and release growth factors that attract fibroblasts, the cells that synthesize collagen (connective tissue). Collagen appears as early as the second day and is the main component of scar tissue.

In a clean wound, the inflammatory phase accomplishes control of bleeding and establishes a clean wound bed. The inflammatory phase is prolonged if too little inflammation occurs, as in debilitating diseases such as cancer or after the administration of steroids. Too much inflammation also decreases the speed of healing as arriving cells compete for available nutrients.

Proliferative Phase. The proliferative phase, in which new blood vessels appear as reconstruction progresses, begins, lasting from 3 to 24 days. The main activities during this phase are filling of the wound with granulation tissue, contraction of the wound, and resurfacing of the wound by epithelialization. Fibroblasts, which synthesize collagen, are present in this phase, providing the matrix for granulation, in turn supporting re-epithelialization. Collagen provides strength and structural integrity to a wound. During this period, the wound contracts to reduce the area that requires healing (**wound contraction**). Lastly, epithelial cells migrate from the wound edges

to resurface. In a clean wound, when the proliferative phase is complete, the vascular bed has been re-established and the area filled with replacement tissue (collagen/granulation tissue), and the surface has been repaired (**epithelialization**). Impairment of healing during this stage usually results from systemic factors such as age, anemia, hypoproteinemia, and zinc deficiency.

Remodelling. Maturation, the final stage of healing, can take up to two years to occur, depending on the depth and extent of the wound. The collagen scar continues to reorganize and gain strength for several months. Usually, scar tissue contains fewer pigmented cells (melanocytes) and has a lighter colour than normal skin. However, you need to pay attention since a healed wound usually does not have the tensile strength of the tissue it replaces.

All chronic wounds described in this chapter are discussed in detail in the RNAO Best Practice Guidelines, which are readily available to you online at <http://www.rnao.org>.

Skin Tears

Aging skin is at a greater risk of developing skin tears because of the thinning of the epidermis. Dehydration, poor nutrition, prolonged use of corticosteroids, impaired sensory perception, and cognitive impairment are all risk factors for skin breakdown. When moving older adult patients in bed or transferring them from bed to gurney for tests, for example, you need to be careful in your handling of the patients. Skin tears and bruising are common problems in this population (Figure 46-12). Any open area on the skin creates the potential for



Figure 46-12 Skin tear. **Source:** Courtesy of Rose Hamm. Cain, J. E. (2009). *Mosby's PDQ for wound care* (p. 18). St Louis, MO: Mosby.

infection (portal of entry for bacteria). Using tape or adhesive dressings on fragile skin can also precipitate skin tears. The use of simple Telfa pads held in place with a woven cotton wrapped bandage (e.g., Kling wrap) or a soft silicone dressing that will not adhere to the skin is effective in protecting the area from further damage and supporting wound healing.

Venous and Arterial Wounds

Venous and arterial wounds are the result of poor circulation and occur in the lower extremities. Venous ulcers are the most common type of lower extremity wound and account for approximately 80% of leg wounds. In addition, these wounds have a recurrence rate of 70% (RNAO, 2007).

Venous Ulcers. Venous ulcers are superficial and irregular in shape (Figure 46-13, A). These wounds usually have a large amount of exudate caused by edema in the surrounding tissue. Venous insufficiency is related to weak vein walls in the legs; furthermore, limited range of motion in the ankle decreases the ability of the calf muscle to pump. Serum and red blood cells leak into the surrounding tissue, which causes the characteristic brownish hemosiderin staining of tissue and skin. In chronic venous insufficiency, the edema in the tissue becomes firm and the lower legs develop a wooden-like appearance, called lipodermatosclerosis.

Treatment of Venous Leg Ulcers. It is important that you assess the ankle-brachial pressure index before using compression therapy to prevent, treat, or diminish edema in the lower legs (Vowden & Vowden, 2001). Because venous leg ulcers are often hard-to-heal wounds, patients may have tried a variety of products, such as lanolin in topical moisturizers, topical antibiotics, or others. These products may create allergic contact dermatitis, and it is best to avoid anything but the most simple, natural products to clean, debride, moisten, and cover. Use normal saline, autolytic debriding agents, preservative-free hydrogels, and soft silicone dressings. Avoid products with preservatives, chemicals in the dressing, and fragrances. Edema control is essential, but many patients are not willing to try or maintain compression therapy. A wound care specialist with training in compression therapy is helpful in assisting you to determine (1) whether the patient has adequate blood flow to allow for compression and (2) different types of compression treatments that may be better suited to certain patients and their goals, especially as lifestyle modifications are usually required to heal venous ulcers.

Arterial Ulcers. Arterial ulcers (also called ischemic ulcers) are caused by inadequate blood flow to the lower extremity (unlike venous ulcers, which are caused by poor

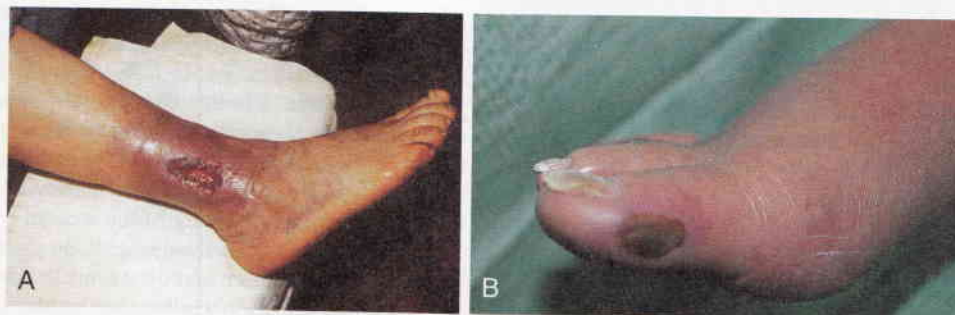


Figure 46-13 A, Venous leg ulcer. B, Arterial lower limb wound. **Source:** Bryant, R., & Nix, D. (2007). *Acute and chronic wounds: Current management concepts* (3rd ed., Plates 34 and 35). St Louis, MO: Mosby.

blood return). Arterial ulcers have a “punched-out” appearance that is both deeper and smaller than venous ulcers. They are often located on the feet, over the tips of the toes, or on the toe joints, but are also found on other locations on the lower leg (Figure 46-13, B). Arterial wounds may be necrotic (black, crusted) in appearance or have very pale wound beds. The legs of a patient with arterial disease are thin and have shiny, taut, and hairless skin with an almost translucent appearance.

Because of the nature of this disease, arterial wounds are quite resistant to healing and could be considered as “maintenance” wounds, where the goal is to provide comfort and protection from infection. These wounds are not good candidates for debridement because poor blood flow will limit ability to heal. The best option for treatment is to keep these wounds clean and dry. Often, you can make a solution of povidone (Betadine) (10% in a 1% solution) using 0.25 povidone to 0.75 normal saline. When you soak the gauze pads in the solution, place them in or on the wound, and change once daily; this will decrease bacteria in the wound and promote drying of the tissue. Both of these results are useful in nonhealing wounds such as arterial ulcers.

Diabetic Ulcers

In Canada, more than 9 million people are living with diabetes or prediabetes (where blood sugar is higher than normal range), according to the Canadian Diabetes Association (2008). The Aboriginal population has much higher percentages of individuals with diabetes (25% of Aboriginal individuals older than 65 years have diabetes). Diabetes is a disease that requires major lifestyle changes, including careful monitoring of blood glucose. Complications related to poorly controlled diabetes have serious results: renal failure, which may require dialysis; diabetic neuropathy, which may lead to limb amputation (Figure 46-14); and retinal neuropathy, which leads to blindness. People with diabetes have compromised healing potential. Any break in the skin can cause long-term problems because these wounds resist healing. Forty-five percent of lower extremity amputations occur in individuals with diabetes. One lower limb amputation of a nontraumatic nature (e.g., diabetes-related) will result in a second limb amputation within three years and death within five years (Tentolouris et al., 2004). These are sobering statistics and reinforce how important it is for you to provide education as well as careful

assessment and early intervention to your patients with diabetes.

Diabetic ulcers occur because of neuropathic changes related to diabetes. They most commonly are found over bony prominences located on the plantar surface of the foot, over the metatarsal heads, and beneath the heels. These changes include sensory neuropathy, loss of protective sensation (e.g., a decrease in the ability to feel pain or temperature change); autonomic neuropathy, or absence of sweating leading to dry skin with fissures, cracks, and calluses over pressure points (heels and ball of the foot); and motor neuropathy, resulting in changes in muscle contractions leading to high arches and cocked-up “hammer” toes. These contribute to pressure points, creating calluses (Figure 46-15).

Assessment. Assessment of the feet in patients with diabetes with a monofilament test (CAWC, 2006) determines the extent of neuropathy (Figure 46-16). However, in patients with diabetes, you can assume that peripheral neuropathy is a risk, and you should conduct education and close inspection and palpation of the feet and lower legs. Prevention starts with instructing patients on appropriate footwear, including wearing hard-soled shoes at home, testing water temperature before bathing or showering, and good foot care, from a certified foot-care specialist such as a chiropodist.



Figure 46-15 Diabetic foot with callus and packing in wound. **Source:** Bryant, R., & Nix, D. (2007). *Acute and chronic wounds: Current management concepts* (3rd ed., Plate 38). St Louis MO: Mosby. Reprinted with permission.



Figure 46-14 Person with above-knee amputation.



Figure 46-16 Monofilament test.

Diabetic Wound Treatment. If the diabetic wound can heal, then necrotic tissue and callus buildup must be debrided to establish a clean wound bed and diminish pressure. Sharp or surgical debridement should be performed only by a qualified health care provider (RN or MD) with appropriate skills and knowledge and supported by agency or institution policy regarding sharp and surgical debridement. Incorrect sharp or surgical debridement can significantly harm your patient. Diabetic wounds may be prophylactically treated with some form of topical antimicrobial dressing. If the patient complains of pain at the wound site, particularly persistent pain, you should suspect osteomyelitis (bone infection). Ensure that the physician or advanced practice nurse primarily responsible for the patient is aware of this so appropriate action can be taken.

Malignant or Fungating Wounds

Cancer tumours may extrude through the skin as swollen masses with numerous fissures that drain purulent, often very malodorous exudate, that sometimes bleed when cleansed or touched. Typical sites for fungating wounds are the side of the face or neck and the breast or groin area (Figure 46-17). These wounds are not only painful at dressing change but also often embarrass the patient because of their odour and unsightliness. They are malignant wounds that will not heal, but the tumours may be reduced in size with radiation or chemotherapy.

Care of the malignant or fungating wound requires attention to environmental and extrinsic issues such as odour, drainage, and appearance of the wound. Odour control may be difficult and may require topical antifungal or antimicrobial dressings such as metronidazole (Flagyl) or a topical silver dressing. Various types of charcoal dressings are also available to provide odour management but are not always effective once they are wet. To avoid trauma to the wound bed, do not use adhesive dressings but use atraumatic dressings such as soft silicone, which will allow for moisture vapour transfer and will decrease pain at dressing changes. Barrier films and the use of silicone (dimethicone)-based creams will provide supportive care and protect the periwound skin. Minimizing the frequency of dressing changes as well as using "low-profile," nonbulky dressings will enhance quality of life.



Figure 46-17 Malignant breast tumour. **Source:** Bale, S., & Jones, V. (2005). *Wound care nursing: A patient-centred approach* (2nd ed., p. 195, Fig. 9-16). St Louis, MO: Mosby. Reprinted with permission.

Acute and Surgical Wounds

You may be in situations in which you are assessing a wound, either at the time of injury before treatment, or after therapy, when the wound is relatively stable. Each situation requires you to make different observations and to take different actions. Regardless of the setting, it is important that you obtain information regarding the cause and history of the wound (see Box 46-4).

Emergency Setting, or Acute, Wounds. You will see wounds in any setting, including clinic, emergency department, youth camps, or your own backyard. When you judge a patient's condition to be stable because of the presence of spontaneous breathing, a clear airway, and a strong carotid pulse (see Chapter 38), inspect the wound for bleeding. The type of wound determines criteria for inspection. For example, a patient presenting with an abrasion would not likely require you to inspect for signs of internal bleeding, but you should do so in the event of a puncture wound.

An **abrasion** is superficial with little bleeding and is considered a partial-thickness wound. The wound often appears "weepy" because of plasma leakage from damaged capillaries. A **laceration**, which is a jagged, unintentional (i.e., nonsurgical) wound, sometimes bleeds more profusely, depending on the wound's depth and location. For example, minor scalp lacerations tend to bleed profusely because of the rich blood supply to the scalp. Lacerations greater than 5 cm long or 2.5 cm deep cause serious bleeding. Puncture wounds bleed in relation to the depth and size of the wound; for example, a nail puncture does not cause as much bleeding as a knife wound. The primary dangers of puncture wounds are internal bleeding and infection.

Inspect the wound for contaminate material. Most traumatic wounds are dirty. Soil, broken glass, shreds of cloth, and foreign substances clinging to penetrating objects sometimes become embedded in the wound.

Your next step is to assess the size (including depth) of the wound. A deep laceration requires suturing. A large open wound may expose bone or tissue that needs to be protected.

When the injury is a result of trauma from a dirty penetrating object, determine when the patient last received a tetanus toxoid injection. Tetanus bacteria reside in soil and in the gut of humans and animals. A tetanus antitoxin injection is necessary if the patient's last one was more than five years ago.

Stable Setting, or Surgical Wounds. When the patient's condition is stabilized (e.g., after surgery or treatment), assess the wound to determine its healing progress. If the wound is covered by a dressing and the dressing is intact and not saturated with drainage, do not directly inspect the wound unless you suspect serious complications. Here, you only need to inspect the dressing and external drains.

Change dressings contaminated with external drainage (e.g., feces or urine) and saturated dressings with leakage to periwound tissue. When doing so, take care to avoid accidental removal or displacement of underlying drains. Because removal of dressings may be painful, assess the patient's need for an analgesic, and once ordered, make sure it is given at least 30 minutes before exposing the wound.

Wound Appearance. Are wound edges closed? A surgical incision healing by primary intention should have clean, well-approximated edges. A **puncture** wound is usually a small, circular wound with the edges coming together toward the centre. Crusts from exudate often form along wound edges.

▶ TABLE 46-5

Assessment of Abnormal Healing in Primary and Secondary Intention Wounds

Primary Intention	Secondary Intention Wounds
Wounds' incision line poorly approximated	Pale or fragile granulation tissue; granulation tissue bed is excessively dry or moist
Drainage present more than three days after closure	Exudate present
Inflammation decreased in first three to five days after injury	Necrotic or sloughy tissue present in wound base
No epithelialization of wound edges by day 4	Epithelialization not continuous
No healing ridge by day 9	Fruity, earthy, or putrid odour present
	Presence of fistula(s), tunnelling, undermining

Adapted from Stotts, N. A., & Cavanaugh, C. E. (1999). Assessing the patient with a wound. *Home Healthcare Nurse*, 17(1), 27.

If the wound edges are separated, you need to inspect the condition of tissue at the wound base. Look for complications such as dehiscence and evisceration. The outer edges of a wound normally appear inflamed for the first 2 to 3 days, but this slowly disappears. Within 7 to 10 days, a normally healing wound resurfaces with epithelial cells, and edges close.

Table 46-5 lists assessment characteristics for abnormal wound healing in primary and secondary wounds. If an infection develops, the area directly surrounding the wound becomes inflamed and swollen.

Skin discolouration usually results from bruising of interstitial tissues or hematoma formation. Blood collecting beneath the skin first takes on a bluish or purplish appearance. Gradually, as clotted blood is broken down, shades of brown and yellow appear.

Character of Wound Drainage. Note the amount, colour, odour, and consistency of drainage. The amount of drainage depends on the location and extent of the wound. For example, drainage is minimal after a simple appendectomy. In contrast, a large abscess may drain a moderate amount for several days. When you need an accurate measurement of the amount of drainage within a dressing, weigh the dressing and compare it with the weight of the same dressing when clean and dry. The general rule is that 1 g of drainage equals 1 mL of drainage volume. Another method of quantifying wound drainage is to chart the number of dressings used and frequency of changes. An increase or decrease in number or frequency of dressings will indicate a relative increase or decrease in wound drainage.

The colour and consistency of drainage vary depending on the type of drainage, including **serous**, **sanguineous**, **serosanguineous**, and **purulent** (see Table 46-6). If drainage has a pungent or strong odour, you should suspect infection.

Describe the wound's appearance according to the characteristics observed. An example of accurate recording follows:

Abdominal incision is 5 cm in width, in RLQ (right lower quadrant); wound edges well approximated without inflammation or exudate.

▶ TABLE 46-6 Types of Wound Drainage

Type	Appearance
Serous	Clear, watery plasma 
Purulent	Thick, yellow, green, tan, or brown 
Serosanguineous	Pale, red, watery: mixture of clear and red fluid 
Sanguineous	Bright red: indicates active bleeding 

1.2 cm diameter circle of serous drainage present on one 4 × 4 gauze changed every 8 hours.

Drains. If a large amount of drainage is anticipated, a drain is often inserted in or near a surgical wound. Some drains are sutured in place. *Exercise caution when changing the dressing around drains, regardless of whether they are sutured, to prevent accidental removal.* A Penrose drain lies under a dressing; at the time of placement, a pin or clip is placed through the drain to prevent it from slipping farther into a wound (Figure 46-18). It is usually the nurse's responsibility to pull or advance the drain as drainage decreases to permit healing deep within the wound site.

When you assess the number of drains, drain placement, character of drainage, and condition of collecting equipment, first observe the security of the drain and its location with respect to the wound. Next, note the character of drainage. If a collecting device is available, measure the drainage volume. Because a drainage system needs to be patent, look for drainage flow through the tubing, as well as around the tubing.

A sudden decrease in drainage through the tubing may indicate a blocked drain, which may require surgical revision. Contact the physician in this case. When a drain is connected to suction, assess the system to be sure that the pressure ordered is being exerted. Evacuator units such as a Hemovac or Jackson-Pratt (Figure 46-19) exert a constant low pressure as long as the suction device (bladder or bag) is fully compressed.

These types of drainage devices are often referred to as self-suction. If the evacuator device is unable to maintain a vacuum on its own, notify the surgeon, who will then order a secondary vacuum system (such as wall suction). If fluid accumulates within the tissues, wound healing will not progress at an optimal rate, increasing risk of infection.

Wound Closures. Surgical wounds are closed with staples, sutures, or wound closures. A frequent skin closure is the stainless steel staple. The staple provides more strength than nylon or silk sutures and causes less irritation to tissue. However, you should look for irritation around staple or suture sites and note whether closures are intact. Normally, for the first two to three days after surgery, skin around sutures or staples is edematous. Continued swelling indicates that closures are too tight. Overly tight suture material may cut into the skin, which can lead to wound separation or wound dehiscence. Early suture removal reduces formation of defects along the suture line and minimizes chances of unattractive scar formation.

Tissue adhesive such as Dermabond forms a strong bond across apposed wound edges, which allows normal healing to occur below. It can be used to replace small sutures for

incisional repair. The product is applied across the approximated wound edges, which are then held together until the solution dries, providing an adhesive closure. Although surgeons generally use it for small superficial lacerations, some may use it on larger wounds, where subcutaneous sutures are needed (Bruns & Worthington, 2000).

Palpation of the Wound. When inspecting a wound, observe swelling or separation of wound edges. Wearing sterile gloves, lightly press the wound edges to detect localized areas of tenderness or drainage collection. If pressure causes fluid to be expressed, note the character of the drainage. The patient is normally sensitive to palpation of wound edges; however, extreme tenderness may be indicative of infection.

Wound Cultures. If you detect purulent or suspicious-looking drainage, you may need to obtain a specimen of the drainage for culture (see Chapter 32). Never collect a wound culture sample from old drainage. Resident colonies of bacteria from the skin grow within exudate and are not always the true causative organisms of a wound infection. Clean a wound first with normal saline to remove skin flora. Aerobic organisms grow in superficial wounds exposed to the air, and anaerobic organisms tend to grow within body cavities. Use a different method of specimen collection for each type of organism as per agency policy (Box 46-7). Swab a wound from the healthiest looking tissue to obtain results consistent with the infectious condition of the wound. It is also appropriate to swab any areas with undermining. See Figure 46-20 for a description of how to swab a wound.

Gram stains, which result in more appropriate treatment earlier in the course of infection than do cultures, are often also performed, but do not usually require any additional specimens. The gold standard of wound culture is tissue biopsy, obtained by physician or nurse with specialized training (Stotts, 2007b).

Complications of Wound Healing

Hemorrhage. Hemorrhage, or bleeding from a wound site, is normal during and immediately after initial trauma. Hemostasis occurs within several minutes unless large blood vessels are involved or the patient has poor clotting function. Hemorrhages that occur after hemostasis indicate a slipped surgical suture, a dislodged clot, infection, or erosion of a



Figure 46-18 Penrose drain.

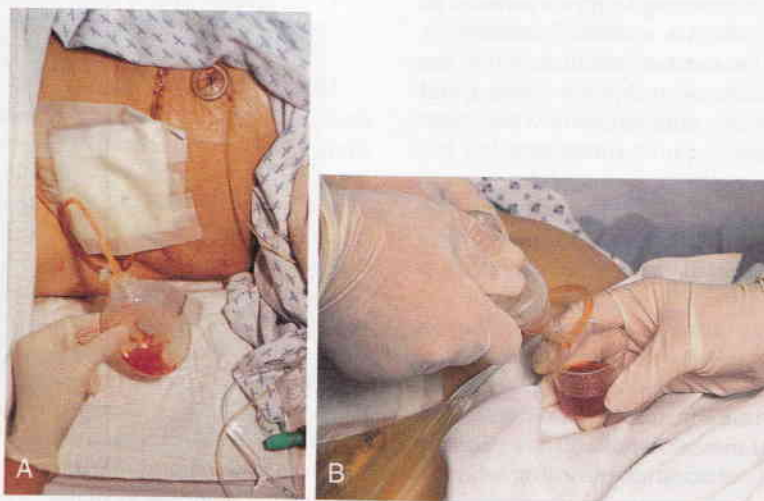


Figure 46-19 Jackson-Pratt drainage device. A, Drainage tubes and reservoir. B, Emptying drainage reservoir.

► BOX 46-7

Recommendations for Standardized Techniques for Wound Cultures*

Quantitative Swab Procedure

- Clean the wound surface with a *nonantiseptic* (i.e., sterile water or normal saline) solution.
- Use a sterile swab from a culturette tube.
- Rotate the swab in 1 cm² of clean tissue in the open wound (see Figure 46-20). Apply pressure to the swab to elicit tissue fluid (Stotts, 2007b). Insert the tip of the swab into the appropriate sterile container, and transport to the laboratory.

*Check agency policy to determine whether you need to obtain an order from a health care provider.

Source: Adapted from Stotts, N. A. (2007b). Wound infection: Diagnosis and management. In R. A. Bryant & D. P. Nix (Eds.), *Acute and chronic wounds: Current management concepts* (3rd ed.). St Louis, MO: Mosby.

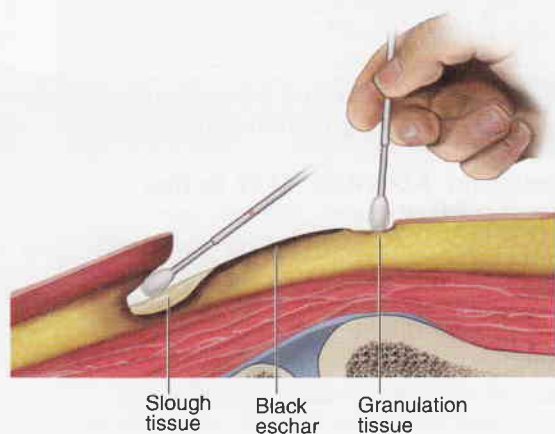


Figure 46-20 Swabbing technique. Swab wound from healthiest looking tissue to obtain results consistent with infectious condition of wound. It is also appropriate to swab any areas with undermining.

Source: Illustration by Nancy A. Bauer. From Bauer, N. A. (2007, revised). *RNAO best practice guideline: Assessment and management of stage I–IV pressure ulcers* (p. 100). Toronto: RNAO.

blood vessel by a foreign object (e.g., a drain). Hemorrhage occurs externally or internally.

You detect internal bleeding by looking for distention or swelling of the affected body part, a change in the type and amount of drainage from a surgical drain, or signs of hypovolemic shock. A **hematoma** is a localized collection of blood underneath the tissues. It appears as a swelling, a change in colour, sensation, or warmth, or a mass that often takes on a bluish discoloration. A hematoma near a major artery or vein is dangerous because pressure from the expanding hematoma obstructs blood flow.

External hemorrhaging is obvious. You observe the dressings covering the wound for bloody drainage. If bleeding is extensive, the dressing soon becomes saturated, and frequently blood drains from under the dressing and pools beneath the patient. *Observe all wounds closely, particularly surgical wounds, in which the risk of hemorrhage is greatest during the first 24 to 48 hours after surgery or injury.*

Infection. Wound infection is the second most common health care–associated infection (nosocomial) (see Chapter 32).

However, infection may not be revealed through a lab culture due to poor culture technique or administration of antibiotics. In fact, all chronic wounds are considered contaminated with bacteria. What differentiates contaminated wounds from infected wounds is the amount of bacteria present. It is generally agreed that infected wounds have more than 100,000 (10^5) organisms per gram of tissue (Stotts, 2007b). The chances of wound infection are greater when the wound contains necrotic tissue, when contaminants are in or near the wound, and when blood supply and local tissue defences are reduced.

Bacterial infection inhibits wound healing. Some contaminated or traumatic wounds show signs of infection early, within two to three days. A surgical wound infection may not develop until day four or five. The patient has a fever, tenderness and pain at the wound site, and an elevated white blood cell count. The edges of the wound appear inflamed. If drainage is present, it is odorous and purulent, and is a yellow, green, or brown colour, depending on the causative organism.

Dehiscence. When a wound fails to heal properly, the layers of skin and tissue separate. This most commonly occurs before collagen formation (3 to 11 days after injury). **Dehiscence** is the partial or total separation of wound layers. A patient at risk of poor wound healing (e.g., poor nutritional status, infection, or obesity) is at risk of dehiscence. However, obese patients have a higher risk because of the constant strain placed on their wounds and the poor healing qualities of fat tissue (Camden, 2007). Dehiscence involves abdominal surgical wounds and may occur after a sudden strain, such as coughing, vomiting, or sitting up (Figure 46-21). Patients often report feeling as though something has given way. *When an increased amount of serosanguineous drainage from a wound occurs, be alert for the potential for dehiscence.* A strategy to prevent dehiscence is to provide support to the area, using a folded thin blanket or pillow placed over an abdominal wound when the patient is coughing. This splints and supports healing tissue when coughing increases intra-abdominal pressure.

Evisceration. With total separation of wound layers, **evisceration** (protrusion of visceral organs through a wound opening) sometimes occurs. It is an emergent condition that requires surgical repair. *When evisceration occurs, you need to quickly place sterile towels soaked in sterile saline over the extruding tissues to reduce the chance of bacterial invasion and drying of the tissues and contact the physician.* If the organs protrude through the wound, blood supply to the tissues is compromised. Do not allow the patient anything by mouth (NPO), observe for signs and symptoms of shock, and prepare the patient for emergency surgery.

Fistulas. A **fistula** is an abnormal passage between two organs or between an organ and the outside of the body. Most fistulas form as a result of poor wound healing or complication of disease, such as Crohn's disease. Trauma, infection, radiation exposure, and diseases such as cancer will prevent tissue layers from closing properly and will allow the fistula tract to form. Fistulas increase the risk of infection and fluid and electrolyte imbalances from fluid loss. Chronic drainage of fluids through a fistula also predisposes a patient to skin breakdown (Box 46-8).

❖ Nursing Diagnosis

Through assessment, clusters of data reveal whether an actual or a risk of *impaired skin integrity* exists. Assessment data may support more than one diagnostic label. For example, a



Figure 46-21 A, Dehiscent wound before wound V.A.C. therapy. B, Dehiscent wound after wound V.A.C. therapy. **Source:** Courtesy Kinetic Concepts, Inc. San Antonio, TX.

► BOX 46-8

Risk of Skin Breakdown from Body Fluids

Low Risk

Saliva
Serosanguineous drainage

Moderate Risk

Bile
Stool
Urine
Ascitic fluid
Purulent exudate

High Risk

Gastric drainage
Pancreatic drainage

► BOX 46-9

Impaired Skin Integrity Related to a Contaminated Wound

Assessment Activities That Define Characteristics

Inspect surface of skin: presence of wound, break in skin integrity
Yellow, foul-smelling drainage from wound
Edges of wound red and warm, not approximated
Sutures remain in place. Inspect wound for signs of healing
Brown-red drainage five days after surgery
Edges of wound not approximated
Obtain patient's temperature, heart rate, white blood cell count, and serum albumin level
Patient is febrile, heart rate is 125 beats per minute, leukocyte (white blood cell) count is $12,000/\text{mm}^3$, and serum albumin level is less than 3.5 mg/100 mL

postoperative patient has purulent drainage from a surgical wound and reports tenderness around the area of the wound. These data support a nursing diagnosis of *impaired skin integrity related to a contaminated wound* (Box 46-9). After completing an assessment of the patient's wound, you would identify nursing diagnoses that will direct supportive and preventive care. Multiple nursing diagnoses are associated with impaired skin integrity and wounds:

- *Risk of infection*
- *Imbalanced nutrition: less than body requirements*
- *Acute or chronic pain*
- *Impaired physical mobility*
- *Impaired skin integrity*
- *Risk of impaired skin integrity*
- *Ineffective tissue perfusion*
- *Impaired tissue integrity*

Some patients are at risk of poor wound healing because of previously defined factors that impair healing. Thus, even though the patient's wound appears normal, you would identify nursing diagnoses, such as *impaired nutrition* or *ineffective tissue perfusion*, that direct nursing care toward support of wound repair.

The nature of a wound can cause problems unrelated to wound healing. *Alteration in comfort* and *impaired mobility* are problems that have implications for the patient's eventual recovery. For example, a large abdominal incision can cause enough pain to interfere with the patient's ability to turn in bed effectively.

❖ Planning

After identifying nursing diagnoses, you develop a plan of care for the patient who is at risk or who has actual impaired skin integrity. During planning, synthesize information from multiple resources (Figure 46-6). Critical thinking ensures that the patient's plan of care integrates all that you know about the individual, as well as key critical thinking elements. Professional standards of practice are especially important to consider when developing your plan of care. Ask yourself what aspects of care you are able to perform without medical orders, what aspects of care you can delegate to other regulated health care providers, and what are the patient goals.

For many of your patients, the wound is only a part of the story. For example, consider the following scenario:

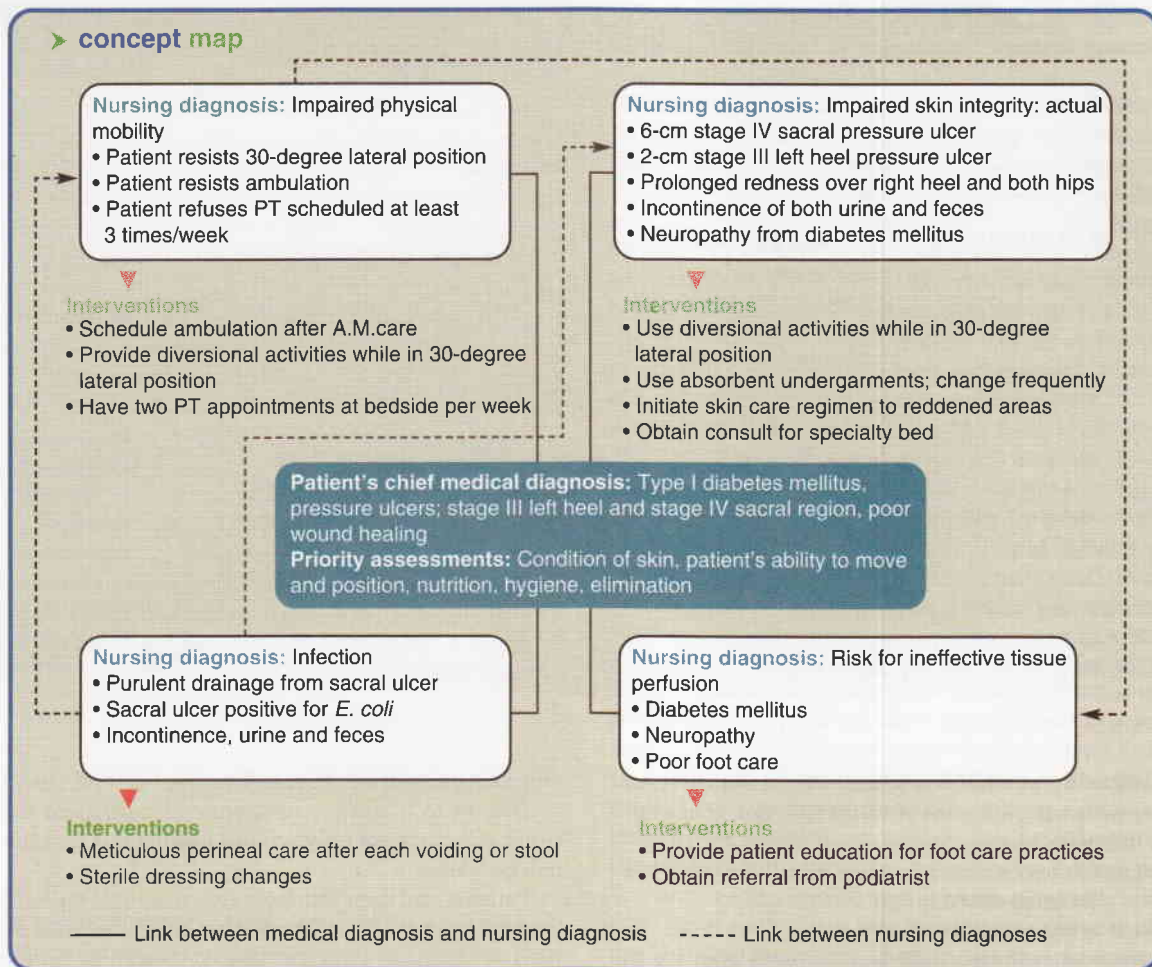


Figure 46-22 Concept map for a patient with a chronic wound.

You are caring for Mrs. Kathy Crane, a 65-year-old woman who lives with her recently retired husband and who has a 30-year history of diabetes mellitus. She currently takes insulin, but her diabetes is poorly controlled because of her inability to adhere to a 1200-calorie diabetic diet and her "hit or miss" approach to testing her serum glucose on a regular basis. She is 32 kg overweight.

For the last 10 years, she has reported decreased sensation in her lower extremities. She does not practise good foot care; she cuts her own toenails and, at home, goes barefoot or wears socks. She regularly soaks her feet in an Epsom-salt footbath because she "read this was good for your feet."

She was admitted to the hospital for elective repair of an abdominal aneurysm. The surgery went well, but postoperatively Mrs. Crane had difficulty ambulating and performing coughing and deep breathing exercises. On her second postoperative day, she developed pneumonia, which required intravenous antibiotics. During the course of her pneumonia, Mrs. Crane stated she was "too tired" to walk or get up to use the commode or toilet. She required an adult continence product as she was now incontinent of urine and stool. She complained of pain when repositioned and would generally reposition herself on her back. Two weeks after her surgery, Mrs. Crane developed a large draining sacral wound, which is now 6 cm in diameter. The base of the wound can be visualized down to bone (stage IV). In addition, she has a smaller, stage III ulcer on her left heel. Skin assessment also reveals areas of prolonged redness over pressure points, especially on the right heel and over both hips.

When planning care for Mrs. Crane, you can use a concept map to individualize care for her, as she has multiple health problems and related nursing diagnoses (Figure 46-22). This map assists you in using critical thinking skills to organize complex patient assessment data and related nursing diagnoses with the patient's chief medical diagnosis. As you identify linkages between nursing diagnoses and medical diagnosis, the concept map also links potential interventions with the patient's health care needs and goals in mind.

Goals and Outcomes

Nursing care is based on the patient's identified needs and priorities. Your first job is to ensure you and the patient are on the same path, regarding the establishment of goals and expected outcomes. In addition, you need to determine whether the wound is likely to heal. For example, a pressure ulcer with unrelieved pressure and/or poor nutritional intake is unlikely to heal. In addition, patients in terminal stages of illness may not have the physiological resources to heal, despite optimal environmental supports. Thus, it is important to plan interventions according to risk of skin breakdown, type and severity of the wound, and complications, such as infection, poor nutrition, and peripheral vascular diseases, which affect wound healing.

► BOX 46-10 Home Care Recommendations for Ulcer or Wound Assessment

Assessment and documentation of the pressure ulcer should occur at least weekly, unless evidence of deterioration exists, in which case you need to reassess both the wound and the patient's overall management immediately. In the home setting, it is essential to include the patient and family in monitoring the progress of the wound.

Psychosocial Assessment and Management

- Assess the patient's resources (e.g., availability and skill of caregivers, finances, equipment). A successful treatment program requires adequate caregiver and equipment resources.
- Evaluate caregivers for their ability to comprehend and implement the treatment requirements.
- Evaluate caregivers for their level of strength and endurance.
- Consider economic factors that may limit the supply and availability of equipment, as well as opportunities to relieve caregivers.
- Use an approach that focuses on the psychosocial and physical factors affecting wound care (Teare & Barrett, 2002).

Ulcer Care Dressings

- Consider caregiver time and ability when selecting a dressing.
- Consider a dressing that, while more expensive per unit, may decrease frequency of dressing change (which is more

cost-effective than a cheaper dressing requiring more frequent dressing change).

Infection Control

- All wounds are colonized; thus, the focus in the home is to avoid introduction of contamination into the wound, either by instruments, dressings, or technique at dressing change (Sibbald et al., 2003).
- Depending on the status of the wound (surgical/acute or chronic), secondary dressings may be clean or sterile, but the contact layer dressing should be from a sterile (unopened) package.
- The "no-touch" technique is generally used. This technique is a method of changing surface dressings without touching the wound or the surface of any dressing that might be in contact with the wound. Adherent dressings should be grasped by the corner and removed slowly, whereas gauze dressings can be pinched in the centre and lifted off (Hart, 2007).
- Place soiled dressings in plastic bag and securely fasten bag closure. Disposal of contaminated dressings in the home should be done in a manner consistent with local regulations and home care agency policies.

A goal frequently identified is to see wound improvement within a two-week period. The outcomes of this goal could include the following:

- Higher percentage of granulation tissue in the wound base
- No further skin breakdown in any body location
- An increase in caloric intake of 10%

These outcomes are reasonable if the overall goal for the patient is to heal the ulcer. Other goals of care for patients with wounds include preventing infection, maintaining skin integrity, comfort, and health promotion.

Setting Priorities

You establish nursing care priorities in wound care based on the comprehensive patient assessment goal expectations and established outcomes. These priorities also depend on whether the patient's condition is stable or acute (emergent). An acute wound needs immediate intervention, whereas in the presence of a chronic, stable wound, other factors, such as mobilization, may have greater priority. No matter what the risk of pressure ulcer development, preventive interventions such as skin care practices, appropriate positioning, and elimination of friction and shear are priorities. Promotion of skin health is also essential. Existing skin breakdown, from skin tears to large chronic wounds, requires ongoing attention because it is frequently the reason for both hospitalization and decrease in quality of life for patients, no matter what the setting. Patient and family preferences, daily activities, and the healing potential of the wound need to be included in the collaborative setting of priorities.

Collaborative Care

Wound care is not just your responsibility, as the nurse caring for this patient. It is a team effort, including physiotherapist, occupational therapist, dietitian, pharmacist, and physician, as well as patient, family, and nurse. With early discharge from health care settings, it is important to consider what resources are required to plan for the patient's ongoing care. Anticipating

wound care needs and related equipment and resources, such as referral to a home care agency or outpatient wound care clinic, supports not only wound healing but also the patient's independence.

Patients and their families often need to continue the objectives of wound management after discharge (Box 46-10). You need to consider caregiver ability, as well as time needed to change a particular dressing when selecting the treatment to use after discharge. In particular, in the community, frequency of home visits is a key factor in resource management. Patients, families, and caregivers need to be provided with education and knowledge so that they understand the importance of good nutrition, pressure off-loading (particularly when sitting in a recliner chair for long periods of time), and how different wound dressings are used. Your role, no matter the health care setting, is to work with the patient and family to develop and support their understanding and involvement to optimize wound healing as much as possible.

❖ Implementation: Preventing Skin Breakdown

Health Promotion

The most effective intervention for problems with skin integrity and wound care is prevention. Prompt, early identification of patient risk factors aids in the prevention of pressure ulcers. Use of a risk assessment tool, such as the Braden Risk Assessment Tool (see Table 46-2) is a first step in identifying a patient's risk of skin breakdown. Table 46-7 provides nursing interventions based on risk factors identified in the Braden Tool. If you identify risk factors, you must follow up with interventions. The three major areas of nursing interventions for prevention of skin breakdown are (1) skin care, including hygiene and moisture management; (2) mechanical loading and support devices, including positioning and use of therapeutic surfaces; and (3) education (RNAO, 2011).

▶ TABLE 46-7

A Quick Guide to Pressure Ulcer Prevention

Risk Factor	Nursing Interventions
Decreased sensory perception	Assess pressure points for signs of nonblanching reactive hyperemia. Provide a pressure-redistribution surface.
Moisture	Assess need for incontinence management. After each incontinent episode, cleanse area with no-rinse perineal cleanser and protect skin with a moisture-barrier ointment.
Friction and shear	Reposition patient by using a drawsheet to lift the patient off the surface. Ensure heels are also supported. Provide a trapeze to facilitate movement. Position patient at a 30-degree lateral turn and limit head elevation to 30 degrees.
Decreased activity or mobility	Establish and post an individualized turning schedule. Ensure functionality of pressure off-loading devices for wheelchair, bed.
Poor nutrition	Assess teeth or dentures; ensure good mouth care. Provide adequate nutritional and fluid intake; assist with intake, as necessary. Consult dietitian for nutritional evaluation.

Topical Skin Care

You need to perform frequent skin assessments (see Box 46-4), at a minimum of once a day; however, high-risk patients may require more frequent skin assessments, such as every shift. In addition, ensure that the patient's skin is clean and dry. Assessment and skin hygiene are two initial defences for preventing skin breakdown. When you clean the skin, avoid soaps and hot water. Use cleansers with nonionic surfactants that are gentle to the skin (CAWC, 2006; RNAO, 2011). Many types of products are available for skin care, and you need to match their use to the specific needs of your patient.

After you cleanse the skin and make sure it is completely dry, apply moisturizer to keep the epidermis well lubricated but not oversaturated. Make an effort to control, contain, or correct incontinence, perspiration, and wound drainage (Bryant & Clark, 2007).

Clinicians find the Agency for Health Care Policy and Research (AHCPR) guidelines on urinary incontinence (1992b) helpful, although the Canadian Urological Association (CUA) (<http://www.cua.org>) has developed Canadian guidelines, accessible on the CUA Web site. Patients who have fecal incontinence and who are also receiving enteral tube feeding provide a management challenge. When patients have an incontinent episode, gently cleanse the area, dry, and apply a thick layer of moisture barrier to the exposed areas. A moisture barrier protects skin from excessive moisture and bacteria found in the urine or stool. Ensure the barrier does not interfere with the function of the adult continence brief. It is helpful to use the expertise of an advanced practice nurse with a focus on wound care or management of incontinence while caring for at-risk patients. Methods for controlling or containing incontinence vary. While medication and surgery are available treatments, you can explore behavioural techniques with your

patient, such as prompted or timed voiding. The RNAO Continence and Constipation Best Practice Guidelines, available at <http://rnao.ca>, provide excellent information to assist you in developing appropriate treatment plans for your patients.

Prior to initiating use of absorbent pads and adult continence briefs, make sure you explore the use of the behavioural techniques mentioned above. Use these absorptive products only as part of the treatment plan for an incontinent patient. Use only products that wick moisture away from the patient's skin (Bryant & Clark, 2007; WOCN, 2010). Use underpads with caution, because some of these pads do not wick the drainage away from the patient's skin and will cause skin damage. In addition, patients who are provided with low air loss or other specialty pressure-relief bed surfaces require continence pads designed specifically for the bed surface.

Positioning

Positioning interventions reduce pressure and shearing force to the skin. Elevating the head of the bed to 30 degrees or less will decrease the chance of pressure ulcer development from shearing forces (RNAO, 2011). Given the importance of repositioning the immobilized patient, according to activity level, perceptual ability, and daily routines (Braden, 2001; RNAO, 2011), a standard turning interval of 1.5 to 2 hours does not always prevent pressure ulcer development in some patients. Regardless, patients need repositioning at least every 2 hours on a schedule. When repositioning, use positioning devices to protect bony prominences (RNAO, 2011). The RNAO guidelines (2011) recommend a 30-degree lateral position, which should prevent positioning directly over a bony prominence. To prevent shear and friction injuries, use a sheet to lift, rather than drag, the patient when changing positions, and ensure the heels are supported as well. Use the expertise of physiotherapists and occupational therapists who are skilled at assessment and treatment modalities for both seating and positioning for beds, chairs, and wheelchairs.

safety alert Incorrect positioning of an immobile patient may create a shearing injury. When repositioning the patient, obtain assistance. With at least one other caregiver, place a drawsheet under the patient, and then grasping the sides of the sheet, use it to lift the patient up and toward the new position. Remember to ensure the heels are not dragging on the bed, as this may contribute to shearing and friction injuries.

If your patient can sit in a chair, limit the duration. For example, if it was determined that the patient should be repositioned every two hours, then the duration of sitting should be less than two hours. Remember, in the sitting position, the pressure on the ischial tuberosities is greater than in the supine position. In addition, encourage patients with some independent mobility to shift weight every 15 minutes when sitting (RNAO, 2011). Shifting weight provides short-term relief on the ischial tuberosities. In addition, have patients sit on a foam, gel, or air cushion to redistribute weight away from the ischial areas, and engage assistance of the physical therapist or occupational therapist to ensure that cushions are correctly inflated and positioned. Rigid and doughnut-shaped cushions are contraindicated because they reduce blood supply to the area, which results in wider areas of ischemia (RNAO, 2011).

After repositioning the patient, reassess the skin. See Box 46-2 for identifying characteristics that indicate early signs of tissue ischemia in darkly pigmented skin. For patients who

have light-toned skin, check for normal reactive hyperemia and blanching.

Never massage the reddened areas. Massaging reddened areas increases breaks in the capillaries in the underlying tissues and increases the risk of injury to those tissues and of pressure ulcer formation (RNAO, 2011).

Support Surfaces (Therapeutic Beds and Mattresses)

A support surface is a specialized device for pressure redistribution designed for management of tissue loads, microclimate, and other therapeutic functions (i.e., mattresses, integrated bed system, mattress replacement, overlay or seat cushion, or seat cushion overlay) (NPUAP, 2007b). A variety of support surfaces exists, including specialty beds and mattresses that reduce the hazards of immobility to the skin and musculoskeletal system. However, none eliminates the need for meticulous nursing care, and no single device eliminates the effects of pressure on the skin.

When selecting support surfaces, thoroughly assess the patient's needs. Knowledge about support surface characteristics (Table 46-8) will assist you in clinical decision making, along with consultations with the physical therapist and occupational therapist.

Fully explain to patients and families why and how these specialty surfaces need to be used (Box 46-11). Some common errors when support surfaces are used are placing the wrong

* BOX 46-11 PATIENT TEACHING

Pressure-Redistribution Surfaces

Objectives

- Patient and family will describe their understanding of the purposes and basic operations of the pressure-redistribution surfaces.



Teaching Strategies

- Explain reasons for the pressure-redistribution surface.
- Explain proper body mechanics while using the pressure-redistribution surface.
- Educate patient and family about the use and care of the pressure-redistribution surface.
- Explain additional pressure-redistribution measures.

Evaluation

- Patient and family will state the basic purposes for the pressure-redistribution surface.
- Patient and family will describe the function of the pressure-redistribution surface.
- Patient and family will demonstrate proper use of the pressure-redistribution surface.

► TABLE 46-8 Support Surfaces

Categories and Definitions	Mechanism of Action	Indications	Examples of Manufacturers' and Product Names
Low-Air-Loss Available in a mattress placed directly on the existing bed frame or an overlay placed directly on top of an existing surface	Pressure redistribution Provides a flow of air to assist in managing the heat and humidity of the skin	Prevention or treatment of skin breakdown	Hill-Rom; Flexair Kinetic Concepts, Inc.; First Step Select; Crown Therapeutics; Select Air Mattress
Nonpowered Any support surface not requiring or using external sources of energy for operation. Examples: foam, interconnected air-filled cells	Pressure redistribution Air moves to and from cells as body position changes	Prevention or treatment of skin breakdown	Crown Therapeutics Roho Dry Floatation Mattress Gaymar Industries/Sof-Care
Air-Fluidized Beds Surfaces that change load distribution properties when powered and when patient is in contact with the surface	Provides pressure redistribution via a fluidlike medium created by forcing air through beads, as characterized by immersion and envelopment	Prevention or treatment of skin breakdown May also be used to protect newly flapped or grafted surgical sites and for patients with excessive moisture	Kinetic Concepts, Inc./ FluidAir/ Hill-Rom/ Clinitron
Lateral Rotation Provides passive motion to promote mobilization of respiratory secretions and provides low-air-loss therapy	Features a support surface that provides rotation about a longitudinal axis, as characterized by degree of patient turn, duration, and frequency	Treatment and prevention of pulmonary complications associated with immobility	Hill-Rom/Total Care Sport/ Kinetic Concepts, Inc./ TriADyne

side of the support surface toward the patient, not plugging in or turning on powered support surfaces, using inappropriate absorbent underlay or bedding, failing to do “hand checks,” and improper inflation (too much or too little) for some support surfaces. Hand checks are done by placing your hand under the support surface (or, if an overlay, between it and the standard mattress or cushion), at the pressure point, with the palm facing up and fingers flat. There should be at least 2.5 cm of support surface between your patient’s pressure point and your hand. If not, the support cushion or bed surface does not provide adequate support.

Education

Education of the patient and caregivers is an important nursing function (Rolstad & Ovington, 2007). What is important is that you individualize your teaching to meet the language, educational level, and learning needs for each patient, especially older patients, or those for whom English is not their first language. You can use a variety of educational tools, including Web-based learning, DVDs and videos, and written materials, when teaching patients and caregivers or family how to prevent and treat pressure ulcers. You can access materials from reputable government, educational, and national organizations such as the Canadian Association of Wound Care (<http://cawc.net>) and the Canadian Association of Enterostomal Therapists (<http://www.caet.ca>). The wound care industry also provides excellent educational materials, although some may be product specific. You can readily access any of these sites through an Internet search engine.

In addition, you need to be aware of the meaning of the experience of a chronic wound for patients and their caregivers (RNAO, 2011). Through research, clinicians are beginning to explore the concerns and issues faced by patients and their frail older spouses caring for their loved ones with pressure ulcers (Goldberg & Beltz, 2010). You need to plan interventions to meet the identified psychosocial needs of patients and their caregivers (CAWC, 2006; RNAO, 2011).

Management of Pressure Ulcers

Treatment of patients with pressure ulcers requires a holistic, team approach (RNAO, 2011). Aspects of pressure ulcer treatment include local care of the wound and supportive measures such as adequate nutrients and redistribution of pressure (Skill 46-2), which may call for the expertise of other members of the interdisciplinary health care team, including physician, physiotherapist, occupational therapist, dietitian, pharmacist, and social worker.

Optimizing wound healing requires monitoring of the wound, but unless infection is suspected or present, the wound will heal best when undisturbed. Many current wound dressings are designed to remain in place for up to a week or even longer, and this approach supports healing in chronic, noninfected wounds (CAWC, 2006; RNAO, 2011). However, this does not diminish the need to regularly assess and document the wound: location, stage, size, tissue type and amount, exudate, and the surrounding skin condition (Nix, 2007).

The use and documentation of a systematic approach to assessment of pressure ulcers leads to better decision making and optimum outcomes (Nix, 2007). Several healing and documentation tools are available for you to use to document wound assessments over time. Using a tool helps link the assessment to outcomes so that an evaluation of the plan of care follows objective criteria (Nix, 2007). For example, the

Pressure Ulcer Status Tool (PSST) (Bates-Jensen, 1995) addresses 15 wound characteristics. You score individual items and total them, providing an overall indication of wound status. The scoring assists in evaluating whether the goals of the wound management plan are effective. Tools such as the PSST may seem overly detailed and time consuming, but when you use them judiciously and regularly, they provide a method of ensuring reliable documentation of nursing actions.

Wound Management. Maintenance of a physiological local wound environment is the goal of effective wound management (Rolstad & Ovington, 2007). To maintain a healthy wound environment, you need to address the following directives: prevent and manage infection, cleanse the wound, remove nonviable tissue, manage exudate, maintain the wound in a moist environment, and protect the wound. A wound will not move through the phases of wound healing if the wound is infected. Prevention of wound infection includes wound irrigation, cleansing, and removal of nonviable tissue.

Cleaning a Wound. Use only noncytotoxic wound cleansers, such as normal saline or commercial wound cleansers, to clean wounds. Noncytotoxic cleansers will not damage or kill fibroblasts and healing tissue (Rolstad & Ovington, 2007). Cytotoxic solutions to absolutely avoid are sodium hypochlorite solution (Dakin’s solution—essentially bleach), acetic acid, povidone-iodine, and hydrogen peroxide. These are *not* to be used in clean granulating wounds because they inhibit wound healing (CAWC, 2006; RNAO, 2011).

Irrigation. Irrigation is a common method of delivering the wound cleansing solution to the wound. Studies have shown that an optimal effective range of irrigation pressures exists that ensure adequate removal of bacteria (RNAO, 2011; Rodeheaver, 2001). To ensure an irrigation pressure within the correct range, use a 35 mL syringe with a 19-gauge angiocatheter or a single 100 mL saline squeeze bottle. Both methods will enhance wound cleansing, but by delivering saline at a pressure between 4 and 15 psi (RNAO, 2011), you will avoid trauma to the wound bed.

Debridement. Debridement is the removal of nonviable, necrotic tissue and is necessary to rid the ulcer of a source of infection, to enable visualization of the wound bed, and to provide a clean base for healing. However, a dry necrotic heel ulcer is an exception. According to the RNAO guidelines (2011), stable, dry, black eschar on heels should not be debrided if no evidence of infection (e.g., pain, purulence, or erythema) appears. The method of debridement—mechanical, autolytic, chemical, or sharp or surgical—will depend on which is most appropriate to the patient’s condition and care goals (RNAO, 2011). During the debridement process, remember that increases in wound exudate, odour, and size are likely to be observed. You will need to assess and effectively manage pain that may occur with debridement (CAWC, 2006; RNAO, 2011).

Mechanical debridement, or a “wet-to-dry” saline gauze dressing, is *not* considered appropriate, as it is nonselective in its removal of both devitalized and viable tissue (CAWC, 2006; RNAO 2011). Biological debridement is the use of maggot therapy. Sterile maggots are used in a wound because they ingest the dead tissue and do not impede granulation (Thomas et al., 2001). Chemical or enzymatic debridement is another option. Topical enzymes induce changes in the substrate, resulting in the breakdown of necrotic tissue (Ramundo & Wells, 2000). Depending on the type of enzyme used, the preparation either digests or dissolves tissue. Care must be taken to apply only to the wound bed, never periwound tissue.

► SKILL 46-2 Treating Pressure Ulcers

Delegation Considerations

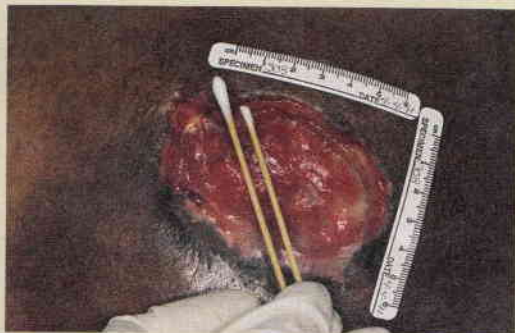
The skill of treating pressure ulcers cannot be delegated to unregulated care providers (UCPs). In some practice settings, you can delegate *nonsterile* dressing application for chronic, established wounds when a nurse has evaluated and designated the protocol. The *assessment* of the wound remains within the scope of the nurse, however, even if the dressing change is delegated. Instruct nursing assistive personnel to do the following:

- Report changes in skin integrity to you immediately
- Report pain, fever, or wound drainage to you immediately
- Report any potential contamination to the existing dressing (e.g., patient incontinence or other bodily fluids; dressing becomes dislodged)

Procedure

STEPS

1. Assess patient's level of comfort using a scale of 1 to 10 and the need for pain medication.
2. Determine if patient has allergies to topical agents.
3. Review order for topical agent or dressing.
4. Close room door or bedside curtains. Position patient to allow dressing removal.
5. Perform hand hygiene, and apply clean gloves. Remove dressing, and place in plastic bag.
6. Assess pressure ulcer(s). All pressure ulcers need individual assessments (see Step 6 illustration).



Step 6 Measuring wound depth (steps b, c, and d.)

- A. Note colour, type, and percentage of tissue present in the wound base.
 - B. Measure width and length of the ulcer(s). Determine width by measuring the dimension from left to right and the length from top to bottom.
 - C. Measure depth of pressure ulcer using sterile cotton-tipped applicator (see Step 6 illustration).
 - D. Measure depth of undermining using sterile cotton-tipped applicator to gently probe under skin edges (see Step 6 illustration).
7. Assess periwound skin for maceration, redness, and denuded areas.
 8. Change to sterile gloves, if needed (check agency policy).

Equipment

- Disposable gloves (clean)
- Plastic bag for dressing disposal
- Disposable measuring tape
- Cotton-tipped applicators (sterile)
- Topical cleansing agent
- Dressing of choice (see Box 46-10)
- Hypoallergenic tape (if needed)
- Documentation record
- Measurement tool to record ongoing wound progress

RATIONALE

- Pain management enables better tolerance for dressing change.
- Topical agents cause localized skin reactions.
- Administration of proper medication and treatment is ensured.
- Privacy is provided; area is accessible for dressing change.
- Transmission of microorganisms is reduced; accidental exposure to body fluids is prevented.
- Consistent assessment will provide the basis for evaluating wound progress (RNAO, 2011).
- Determining tissue type assists in dressing selection.
- Ulcer size will change as healing progresses; therefore, longest and widest areas of the wound will change over time. Measuring width and length by measuring the same area will provide a consistent measurement (Nix, 2007).
- Depth is important to determine wound volume. Although surface area adequately represents tissue loss in stage II ulcers, volume more adequately represents tissue loss in stage III and IV wounds (RNAO, 2011).
- Undermining represents loss of underlying tissue (subcutaneous and muscle) to a greater extent than the skin. Undermining indicates progressive tissue loss.
- Deterioration of skin around a wound indicates infection, excessive wound exudate, or skin stripping from adhesive removal.
- Avoid potential contamination of wound from external source. Refer to institutional policy regarding use of clean or sterile gloves.

► SKILL 46-2 Treating Pressure Ulcers—cont'd

9. Cleanse ulcer thoroughly with normal saline or cleansing agent. Use irrigating syringe for deep ulcers.
 10. Apply topical agents, as prescribed:
 - A. Enzymes (where available)
 - (1) Apply thin, even layer of ointment over necrotic areas of ulcer only, where eschar has been scored if required. Protect periwound skin.
 - (2) Apply secondary nonadherent gauze dressing directly over ulcer.
 - (3) Tape securely in place.
 - B. Hydrogel
 - (1) Cover surface of ulcer with thin layer of hydrogel using applicator or gloved hand.
 - (2) Apply secondary nonadherent gauze dressing or transparent dressing over wound, and adhere to intact skin.
 - C. Calcium alginate or hydrofibre
 - (1) Lightly pack wound with alginate or hydrofibre using applicator or gloved fingers.
 - (2) Apply secondary dressing of nonadherent gauze, absorbent pad, or foam over alginate. Tape in place.
 11. Remove gloves, dispose of soiled supplies. Perform hand hygiene.
 12. Assess pressure ulcer at each dressing change or sooner if the wound or patient's condition deteriorates (Nix, 2007). Utilize agency's tool for wound assessment.
 13. Compare wound assessment to identified plan of care, and discuss with health care team if increase in size of wound, increased presence of pain, foul-smelling drainage, or increase in devitalized tissue.
- Wound debris must be removed to support healing tissue (RNAO, 2011).
 - A thick layer of ointment is not necessary; a thin layer absorbs and is more effective (Rolstad & Ovington, 2007). Check manufacturer's directions for frequency of application.
 - Wound is protected. Bacteria are prevented from entering wound.
 - Dressing is kept in place. Use tape or adhesive that will not irritate skin.
 - A moist wound environment is maintained.
 - Wound base is covered and hydrogel–wound interface is maintained.
 - Wound moisture is maintained while excess drainage is absorbed.
 - Alginate is held against wound surface.
 - Transmission of microorganisms is reduced.
 - Not all patients with wounds will follow healing trajectory due to comorbidities. Consistent assessment provides record of healing progress, deterioration, or stalled wound.
 - Wound care is an interdisciplinary activity and requires involvement of the team of health care providers as well as patient and family.

Critical Decision Point: A clean pressure ulcer should show evidence of some healing within two to four weeks. Do *not* use the pressure ulcer staging system to measure pressure ulcer healing. The system measures depth of wound, not healing (WOCN, 2003).

14. Complete wound documentation required for one of the wound assessment instruments per agency's protocol.
- Assessments compared over time will determine progress toward wound healing.

Unexpected Outcomes

Maceration of skin surrounding ulcer

Deepening of ulcer and increased drainage

Related Interventions

- Reduce exposure of surrounding skin to topical agents and moisture.
- Consider use of a skin barrier on periwound skin.
- Use a dressing that will wick exudate away from periwound skin.
- Notify health care team re: possible wound infection.
- Obtain necessary wound cultures.
- Obtain additional consults (e.g., wound care specialist).

Recording and Reporting

- Record assessment of ulcer in patient's record.
- Describe type of topical agent used, dressing applied, and patient's response.
- Report any deterioration in ulcer appearance.

Home Care Considerations

- Assess ability of patient or family to manage dressing changes and provide education and support.
- Patients need to dispose of contaminated dressings in the home in a manner consistent with local regulations (WOCN, 2003).
- Discuss need for a home pressure-redistribution surface or bed.

Current best practice treatment options are autolytic and sharp or surgical debridement (the "gold standard"). Autolytic debridement uses synthetic dressings over a wound to allow the eschar and fibrinous slough within the wound to be self-digested by the action of enzymes that are present in wound fluids (CAWC, 2006). Dressings that support moisture at the wound surface (e.g., hydrogel or hydrocolloid) maintain a moist wound bed ("moist like your eyeball"), which allows the movement of epithelial cells and facilitates wound closure; however, a wound that has excessive exudate (drainage) provides an environment that supports bacterial growth, macerates the periwound skin, and slows the healing process (CAWC, 2006). If exudate is excessive, use an absorptive dressing (e.g., calcium alginate, hydrofibre, or foam) and evaluate volume, consistency, and odour of drainage to determine whether infection may be present.

Sharp or surgical debridement is the most efficient way to reach vitalized tissue at the base of a wound and is also used when sepsis can be localized and excised. Surgical debridement with a scalpel, scissors, or other sharp instrument should be performed only by those health care providers with knowledge, skill, and competence to perform the procedure, usually physicians and advanced practice nurses (e.g., nurse practitioners). Your regulating authority (e.g., College of Nurses) and your agency or institution policy mandates whether you are able to perform sharp or surgical debridement.

Remember, the wound will not heal, regardless of the use of topical therapy (Rolstad & Ovington, 2007), unless you control or eliminate the causative factors (e.g., malnourishment, shear, friction, pressure, and moisture). In addition, as the wound goes through the phases of healing, you will need to alter the treatment plan. For example, in the management of a necrotic and sloughy wound, you may initially use a hydrocolloid dressing to autolytically debride the wound. Because this process takes time, leave the dressing intact for up to one week. Once the wound is cleansed of necrotic, fibrinous tissue, you will discontinue the hydrocolloid dressing and choose another dressing after assessing the wound base characteristics. Continued reassessment is key to supporting the wound as it moves through the phases of wound healing. It cannot be stressed enough how important it is for you to explain the process of wound healing to the patient and family.

Growth Factors. Growth factors regulate most of the key actions of cells during wound healing, and topical growth factors regulate the healing of chronic wounds (Schultz, 2007). Through extensive studies of the molecular regulation of healing, researchers now better understand the role of various growth factors involved in wound healing, including epidermal growth factor, platelet-derived growth factor, fibroblast growth factor, and transforming growth factor. Depending on the setting, you may be responsible for the use of this treatment modality.

Nutritional Status. Nutritional assessment and support of the patient with a wound is a key component in normal cellular integrity and tissue repair (Stotts, 2007a). You need to correct inadequate nutrition and support healing through early intervention. The Joint Commission (2007) recommends nutritional assessment within 24 hours of admission. Assess the patient's mouth and skin for signs of nutritional deficiencies (see Chapter 42). Reassessments reflect changes in status and effects of interventions (Stotts, 2007a). Box 46-12 defines parameters for clinically significant malnutrition (AHCPR, 1994).

> BOX 46-12

AHCPR* Recommendations for Nutritional Assessment and Management of Pressure Ulcers

Assessment of Clinically Significant Malnutrition

Serum albumin is less than 3.5 mg/100 mL.
Total lymphocyte count is less than 1800/mm³.
Body weight has decreased more than 15%.

Interventions

- Involve dietitian to prevent malnutrition and ensure adequate dietary intake.
- Maintain serum albumin level greater than 3.5 mg/100 mL.
- Maintain total lymphocyte count greater than 1800/mm³.
- Perform an abbreviated nutritional assessment, according to institutional policy and as defined by the Nutritional Screening Initiative, at least every three months for patients who are unable to take food by mouth or who experience an involuntary change in weight.
- Encourage dietary intake or supplementation if a patient with a pressure ulcer is malnourished. If dietary intake continues to be inadequate, impractical, or impossible, use nutritional support (usually tube feeding) to place the patient into positive nitrogen balance (approximately 30 to 35 calories/kg/day and 1.25 to 1.50 g of protein/kg/day) according to the goals of care.
- Give vitamin and mineral supplements if you suspect or confirm deficiencies.

*AHCPR, Agency for Health Care Policy and Research.

Source: Adapted from Agency for Health Care Policy and Research, Panel for Treatment of Pressure Ulcers in Adults. (1994). *Treatment of pressure ulcers: Clinical practice guideline no. 15*. (AHCPR Pub No. 95-0653). Rockville, MD: Agency for Health Care Policy and Research, Public Health Service, U.S. Department of Health and Human Services.

Protein Status. Patients with a potential for or actual decreased serum albumin levels or poor protein intake need a nutritional evaluation to ensure proper caloric intake (AHCPR, 1994). A patient can lose as much as 50 g of protein per day from an open, weeping pressure ulcer. Although the recommended intake of protein for adults is 0.8 g/kg/day, a higher intake of protein up to 1.8 g/kg/day is necessary for healing. Increased protein intake helps rebuild epidermal tissue. Increased caloric intake helps replace subcutaneous tissue. Vitamin C promotes collagen synthesis, capillary wall integrity, fibroblast function, and immunological function.

Hemoglobin. A low hemoglobin level decreases delivery of oxygen to the tissues and leads to further ischemia. When possible, maintain hemoglobin at 12 g/100 mL.

Dressings

For surgical wounds that heal by primary intention, it is common to remove dressings as soon as drainage stops. In contrast, when a wound is healing by secondary intention, the dressing material becomes a means for providing an optimal healing environment.

Purposes of Dressings. A dressing serves several purposes:

- Protects wound from microorganism contamination
- Aids in hemostasis
- Promotes healing by absorbing drainage and supports autolytic debridement

- Supports or splints the wound site
- Protects the patient from seeing the wound (if perceived as unpleasant)
- Promotes thermal insulation of the wound surface
- Provides a moist environment for the wound bed

In a normally healing wound, when wound drainage is minimal, the healing process forms a natural fibrin seal that eliminates the need for a dressing. Wounds with extensive tissue loss always need a dressing.

A pressure dressing is applied with elastic bandages, exerts localized downward pressure over an actual or potential bleeding site, and eliminates dead space in underlying tissues so that wound healing progresses normally. Check pressure dressings to be sure that they do not interfere with circulation to a body part. Assess skin colour, pulses in distal extremities, the patient's comfort, and changes in sensation. Pressure dressings are not routinely removed.

Specific dressings cover and protect certain types of wounds, such as large wounds, wounds with drainage tubes or suction catheters in the wound, wounds that need frequent changing, and fistulas. For these wounds, pouches or special wound collection systems cover the wound and collect wound drainage. Some of these devices have a plastic flange on the front of the wound pouch, which allows you to change wound packing without removing the wound pouch from the skin.

Understanding the method of action and purpose of the dressing selection facilitates wound healing (Rolstad & Ovington, 2007). When you identify the objectives for care of the wound, the dressing choice becomes clear. For example, a wound requiring exudate management requires a different type of dressing than one that requires debridement.

A primary function of a dressing on a healing wound is to protect the fragile wound bed. Most traditional surgical dressings have three layers: a contact or primary layer, an absorbent layer, and an outer protective or secondary layer. The contact dressing covers the incision and part of the adjacent skin. Fibrin, blood products, and debris adhere to the contact dressing's surface. A dressing that does not adhere to the wound bed, such as a Telfa pad or soft silicone, will not cause the dressing to stick to the suture line. Use of dry gauze or improper removal of the dressing will disrupt the healing epidermal surface. If a dressing sticks to the surgical incision, the dressing needs to be saturated with saline solution to release it from the incisional area and prevent trauma to the wound bed.

Types of Dressings. Wet-to-dry and wet-to-moist dressings are still often ordered, despite extensive research literature over the past 40 years that has clearly identified *moist wound healing* as being the most appropriate, in most situations, to manage wounds and support healing within the wound. As clinical researchers develop more appropriate dressings, it is essential that you understand the reason why wet-to-dry and wet-to-moist dressings are neither current best practice, nor supported in the research literature.

The basic premise behind the wet-to-dry dressing is to put a wet dressing (gauze and normal saline) on a wound, allow it to dry out, and then pull off the now-dry dressing, thereby mechanically debriding the wound. This is not effective, however, since the action is nonselective, so healthy granulating tissue is removed along with any necrotic or sloughy tissue. In addition, this type of action is inevitably painful to the patient; given the current availability of nontraumatic dressings, this seems an unnecessary condition for patient care.

Wet-to-moist dressings are the use of a saline-soaked gauze that is not left to dry out on the wound, but rather kept moist on the wound through frequent dressing changes. Research has shown that frequency of dressing changes has a negative impact on wound healing (the disruption of fragile granulation tissue, cooling down the wound bed, etc.). As well, the dressing that is moistened with normal saline becomes a hypertonic environment that pulls fluid out of the wound bed in a way that leaves a slurry of blood and proteins on the surface of the wound, which, if not kept constantly moist, dries out (becoming a wet-to-dry dressing).

However, since these approaches are still used in some situations, you do need to know the steps to follow when applying this type of dressing to a wound. It is strongly recommended that you consider alternatives (and there are many) to this approach, since it is not particularly effective in promoting wound healing. You are encouraged to discuss the rationale for moist wound healing for the patient in question with the other care providers, in order to support evidence-informed best practices (Ovington, 2001).

Dressings vary by type of material and mode of application (wet or dry) (Skill 46-3). They need to be easy to apply, comfortable, and made of materials that promote wound healing. The RNAO guidelines (2011) should help you select dressings that respond to the need of the wound, based on the goal for the wound: to heal, to protect from infection, to provide comfort, or to maintain current status (nonhealing wound). A dressing designed to wick away exudate and avoid skin stripping from adhesives will protect the periwound skin. Protecting the wound bed requires a dressing that will maintain a moist wound bed (not too dry, not too wet), prevent contamination from external sources such as feces or urine, and be conformable to the wound and surrounding tissue (Box 46-13; see also Table 46-9). In addition, if the wound is deep, undermining, or has tunnelling or sinus tracts, ensure that no dead space remains to create an opportunity for an abscess to develop. In this situation, lightly pack the wound with appropriate dressing material (i.e., nonwoven gauze moistened with hydrogel in a dry wound, hypertonic sodium ribbon in a wet or contaminated wound, and silver or cadexomer iodine packing in an infected wound [Sibbald, Orsted, et al., 2006]).

► BOX 46-13

WOCN* Dressing Recommendations

- Use a dressing that will continuously provide a moist ("like your eyeball") environment. Wet-to-dry dressings should be avoided.
- Perform wound care using topical dressings as determined by a thorough assessment. No specific studies have proven an optimal dressing type for pressure ulcers.
- Choose a dressing that keeps the surrounding intact (periulcer) skin dry while keeping the ulcer bed moist.
- Choose a dressing that controls exudate but does not desiccate the ulcer bed.
- Consider caregiver time, ease of use, availability, and cost when selecting a dressing.
- Eliminate wound dead space by loosely filling all cavities with dressing material.

*WOCN, Wound, ostomy, and continence nurses.

Source: Adapted from Wound, Ostomy and Continence Nurses Society. (2003). *Guideline for prevention and management of pressure ulcers*. WOCN Clinical Practice Guidelines Series. Glenview, IL: Author.

► SKILL 46-3 Applying Dry and Moist Dressings

Delegation Considerations

The skill of applying dry and moist dressings to the new acute wound cannot be delegated to unregulated care providers (UCPs). In some settings, you can delegate aspects of wound care, such as changing of dressings using *clean* techniques for chronic wounds. The *assessment* of the wound remains within the scope of the nurse, however, even if the dressing change is delegated. Instruct nursing assistive personnel to do the following:

- Report pain, fever, bleeding, or wound drainage to you immediately
- Report any potential contamination to the existing dressing (e.g., patient incontinence or other bodily fluids; dressing becomes dislodged)

Procedure

STEPS

1. Perform hand hygiene. Obtain information about size and location of wound.
2. Assess patient's level of comfort.
3. Review orders for dressing change procedure.
4. Explain procedure to patient, and instruct patient not to touch wound area or sterile supplies.
5. Close room or cubicle curtains and windows.
6. Position patient comfortably, drape with bath blanket to expose only wound site.
7. Place disposable bag within reach of work area. Fold top of bag to make cuff (see Step 7 illustration).



Step 7 Disposable waterproof bag placed near the dressing site.

8. Apply face mask and protective eyewear, if needed.
9. Put on clean, disposable gloves; remove tape, bandage, or ties.
10. Remove tape: pull parallel to skin toward dressing; remove remaining adhesive from skin.
11. With gloved hand, carefully remove gauze dressings one layer at a time, taking care not to dislodge drains or tubes.

Equipment

- Sterile gloves
- Variety of gauze dressings and pads
- Irrigation kit
- Cleansing solution
- Sterile solution
- Clean, disposable gloves
- Tape, ties, or bandages, as needed
- Waterproof bag
- Extra gauze dressings, or abdominal pads

RATIONALE

- Transmission of microorganisms is reduced. Plan for proper type and amount of supplies needed. Know when assistance is needed to hold dressings in place.
- Removal of a dry dressing is painful; some patients require pain medication.
- Orders indicate type of dressing or applications to use.
- Explanation decreases anxiety. Sudden, unexpected movement on patient's part will result in contamination of wound and supplies.
- Privacy is provided; airborne microorganisms are reduced.
- Wound is accessible; unnecessary exposure is minimized.
- Soiled dressings can easily be disposed of. Bag's outer surface is not soiled.

- Transmission of pathogens to exposed tissues is reduced. Mask and eyewear protects from splashes.
- Transmission of infectious organisms from soiled dressings to hands is prevented.
- Pulling tape toward dressing reduces stress on suture line or wound edges.
- Appearance of drainage is sometimes upsetting to patient. Removal of one layer at a time reduces the chance of accidental removal of underlying drains.

► SKILL 46-3 Applying Dry and Moist Dressings—cont'd

- A. If dressing sticks on a wet-to-dry dressing, do not moisten it; instead gently free dressing, and alert patient of potential discomfort.
- Wet-to-dry dressing should debride wound (Ramundo & Wells, 2000). Do not wet the dressing to remove it. However, re-assess and select other method of debridement.

Critical Decision Point: Never use a wet-to-dry dressing in a clean granulating wound. Use only for debridement and only if other debridement options are unavailable (Ramundo, 2007).

12. Observe character and amount of drainage on dressing and appearance of wound.
13. Fold dressings with drainage contained inside, and remove gloves inside out. With small dressings, remove gloves inside out over dressing (see Step 13 illustration). Dispose of gloves and soiled dressings in disposable bag. Perform hand hygiene.
14. Open sterile dressing tray or individually wrapped sterile supplies. Place on bedside table (see Step 14 illustration).
- Estimate of drainage amount and appearance of wound assist in determining progress.
- Transmission of microorganisms is reduced. Hands do not come into contact with material on gloves.
- Sterile dressings remain sterile while on or within sterile surface. Preparation of supplies prevents break in technique during dressing change.



Step 13 Removal of disposable gloves over contaminated dressing.



Step 14 Sterile dressing equipment.

15. If ordered, cleanse or irrigate wound:
 - A. Pour ordered solution into sterile irrigation container.
 - B. Using syringe, gently allow solution to flow over wound.
 - C. Continue until the irrigation flow is clear.
 - D. Dry surrounding skin.

Critical Decision Point: Some wound cleansers are available in spray bottles. Spray to loosen debris.

16. Apply dressing:
 - A. Dry dressing
 - (1) Apply sterile gloves.
 - (2) Inspect wound for appearance, drains, drainage, and integrity.
 - (3) Cleanse wound with solution:
 - (a) Clean from least-contaminated area to most-contaminated area.
 - (4) Dry area.
 - (5) Apply sterile, dry dressing covering wound.
 - (6) Apply topper (cover) dressing if indicated.
 - B. Moist dressing
 - (1) Apply clean gloves.
 - (2) Remove old dressings, discard.
- Sterile supplies can be handled without contamination.
- Wound healing status is indicated.
- Contamination of previously cleaned area is prevented.
- Protection and absorption of wound drainage is provided.
- Wound is protected from external environment.
- Topper dressing prevents strikethrough of wound drainage and provides a surface to tape the dressing in place.

Continued

► SKILL 46-3 Applying Dry and Moist Dressings—cont'd

- (3) Assess surrounding skin (see Step 16B[3] illustration). Discard gloves.



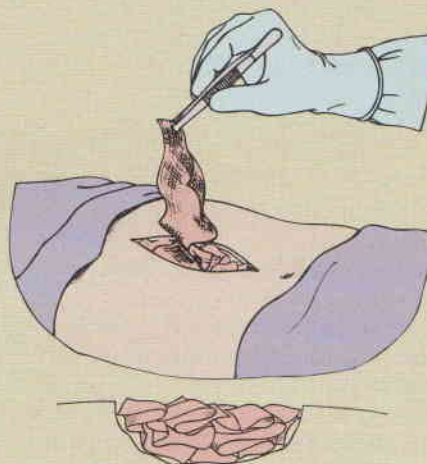
Step 16B(3) Exposure of wound facilitates assessment of wound and surrounding skin.

- (4) Apply sterile gloves.
 (5) Cleanse wound base with normal saline or commercially prepared wound cleanser. Assess wound base.
 (6) Moisten gauze with prescribed solution. Gently wring out excess solution. Unfold.
 (7) Apply gauze as a single layer (see Step 16B[7] illustration) directly onto the wound surface. If wound is deep, gently pack dressing into wound base by hand or with forceps until all wound surfaces are in contact with the gauze. If tunnelling is present, use a cotton-tipped applicator to place gauze into tunnelled area. Be sure gauze does not touch the surrounding skin (see Step 16B[7] illustration).

- Surrounding skin assessment provides an evaluation of wound management.



Step 16B(7) Packing wound with single layer of gauze.



- (8) Cover with sterile dry gauze and topper dressing.

17. Secure dressing.

A. Tape: Apply nonallergenic tape to secure dressing in place.

B. Montgomery ties (see Figure 46-23 on p. 1290)

- (1) Expose adhesive surface of tape on end of each tie.
 (2) Place ties on opposite sides of dressing.
 (3) Place adhesive directly on skin, or use skin barrier.

- Handling of sterile supplies can occur without contamination.
- Cleansing removes wound debris for adequate assessment.
- Gauze needs to be moist to allow for absorption of wound debris.
- Inner gauze needs to be moist, not dripping wet, to absorb drainage and adhere to debris. Excessively moist dressings result in moisture-associated skin damage (maceration) in the periwound skin (Gray & Weir, 2007). The wound needs to be loosely packed to facilitate wicking of drainage into absorbent outer layer of dressing.
- Topper dressing prevents strikethrough of wound drainage and provides a surface to tape the dressing in place.
- The goal for securing a dressing is to keep the dressing in place and intact without causing damage to underlying and surrounding skin.
- Protects periwound skin from breakdown through frequent dressing changes.
- Skin barrier (Stomahesive) protects intact skin from stretch and tension of adhesive tape.

► SKILL 46-3 Applying Dry and Moist Dressings—cont'd

- C. For dressings on an extremity, secure dressing with rolled gauze or an elastic net (see Step 17C illustration)



Step 17C Elastic net securing a lower extremity dressing.

18. Remove gloves, and dispose of in bag. Remove any mask or eyewear.
19. Dispose of supplies, and perform hand hygiene.
20. Assist patient to comfortable position.

- Transmission of infection is reduced.
- Transmission of infection is reduced.
- Patient's sense of well-being is promoted. Comfort is enhanced.

Unexpected Outcomes

Wound appears inflamed, tender, with or without drainage

Wound drainage increases

Wound bleeds during dressing change

Sensation that "something has given way under the dressing"

Related Interventions

- Monitor patient for signs of infection (e.g., increased temperature or white blood cell count).
- Obtain wound culture.
- Notify health care provider.
- Increase frequency of dressing changes.
- Notify health care provider, who may consider drain placement to facilitate wound drainage.
- Observe colour. If drainage is bright red and excessive, you will need to apply pressure.
- Inspect along dressing and underneath patient to determine amount of bleeding.
- Obtain vital signs, as needed.
- Notify health care provider.
- Observe wound for increased drainage or separation of sutures.
- Protect wound. Cover with sterile moist dressing.
- Instruct patient to lie still.
- Notify health care provider.

Recording and Reporting

- Report brisk, bright-red bleeding or evidence of wound dehiscence or evisceration to health care provider immediately.
- Report wound and periwound tissue appearance, colour, and tissue type and presence and characteristics of exudate, type and amount of dressings used, and tolerance of patient to procedure.
- Record patient's level of comfort.
- Write date and time dressing applied on tape in ink (not marker).

Home Care Considerations

- More expensive specialty dressings are sometimes used because they decrease the frequency of dressing changes.
- Assess ability of patient and family to manage dressing changes independently.
- Patients need to dispose of contaminated dressings in the home in a manner consistent with local regulations.

Woven Gauze Dressings. In the past, woven gauze dressings were commonly used to provide coverage for wounds; however, research has demonstrated their efficacy in wound healing is limited (CAWC, 2006). Providing the opportunity for a noninfected wound to heal using "moist wound healing" approaches and dressings does limit the use of gauze as an effective dressing. However, nonwoven gauze remains useful as packing material (e.g., Nu-gauze). Gauze is available

in different textures and in various lengths and sizes; the 4 × 4 is the most common. Gauze can be saturated with solutions and used to cleanse and pack a wound. When used to pack a dry wound, the gauze should be lightly moistened with hydrogel (see p. 1287) to provide moisture to the wound bed. Use nonadherent gauze dressings such as Telfa over clean wounds with little or no drainage. Telfa gauze has a shiny, nonadherent surface that does not stick to incisions or wound openings but

► TABLE 46-9 Wound Care Dressings

	Class	Description	Local Wound Care*			Care Considerations
			Tissue Debridement	Infection	Moisture Balance	
1. Films and membranes		Semipermeable adhesive sheet. Impermeable to H ₂ O molecules and bacteria	+	–	–	Moisture vapour transmission rate varies from film to film. Should not be used on draining or infected wounds.* Create occlusive barrier against infection.
2. Nonadherent contact layer		Sheets of low adherence to tissue. Nonmedicated tulle, silicone, and petrolatum-based woven dressings.	–	–	–	Allow drainage to seep through pores to secondary dressing and evaporate off the wound. Require a cover (absorbent) dressing.
3. Hydrogels		Polymers with high H ₂ O content. Available in gels, solid sheets, or impregnated gauze	++	–	+	Should not be used on draining wounds. Solid sheets should not be used on infected wounds.
4. Hydrocolloids		May contain gelatin, sodium, carboxymethylcellulose, polysaccharides, or pectin, or a combination of these. Sheet dressings are occlusive and have polyurethane film outer layer	+++	+/-	++	Should be used with care on fragile skin. Should not be used on heavily draining or infected wounds.* Create occlusive barrier to protect the wound from outside contamination. Characteristic odour may accompany dressing change and should not be confused with infection.
5. Calcium alginates		Sheets or fibrous ropes of calcium sodium alginate (seaweed derivative). Have hemostatic capabilities	++	+	+++	Should not be used on dry wounds. Avoid packing into narrow deep sinuses because of low tensile strength. Bioreabsorbable.
6. Composite dressings		Multilayered, combination dressings to increase absorbency and autolysis	+	–	+++	Use on wounds on which dressing may stay in place for several days.*
7. Foams		Nonadhesive or adhesive polyurethane foam. May have occlusive backing. Sheets or cavity packing. Some have fluid lock.	–	–	+++	Use on moderate to heavily draining wounds. Occlusive foams should not be used on heavily draining or infected wounds.*
8. Charcoal		Contains odour-absorbent charcoal within product	–	–	+	Some charcoal products are inactivated by moisture. Ensure that dressing edges are sealed.
9. Hypertonic		Sheet, ribbon, or gel impregnated with sodium concentrate.	+	+	++	Gauze ribbon should not be used on dry wounds. May be painful on sensitive tissue. Gel may be used on dry wounds.
10. Hydrophilic fibres		Sheet or packing strip of sodium carboxymethyl-cellulose. Converts to a solid gel when activated by moisture (fluid lock).	+	–	+++	Best for moderate amount of exudate. Should not be used on dry wounds. Avoid packing into narrow deep sinuses because of low tensile strength.
11. Antimicrobials		Medical grade honey, silver, cadexomer iodine with vehicle for delivery: sheets, gels, alginates, foams, or paste	+	+++	+	Broad spectrum against bacteria. Not to be used on patients with known hypersensitivities to any product components.

*"+ " indicates the appropriateness of the dressing for tissue debridement, infection, and moisture balance. "–" indicates the dressing is not considered beneficial in these areas. Use with caution if critical colonization is suspected.

From Registered Nurses Association of Ontario. (2011, revised). *RNAO best practice guideline: Assessment and management of stage I-IV pressure ulcers* (pp. 102–103). Toronto: Author.

► TABLE 46-9 Wound Care Dressings—cont'd

	Class	Local Wound Care*			Care Considerations
12. Other devices	NPWT applies localized negative pressure to surface and margins of wound. Dressings consist of polyurethane or polyvinyl alcohol materials.	—	+	+++	Pressure-distributing wound dressing actively removes fluid from the wound and promotes wound edge approximation. Advanced skill required for patient selection for this therapy.
13. Biological	Living human fibroblasts provided in sheets at ambient or frozen temperatures. Extracellular matrix. Collagen-containing preparations. Hyaluronic acid. Platelet-derived growth factor.	—	—	—	Should not be used on wounds with infection, sinus tracts, excessive exudate, or on patients known to have hypersensitivity to any of the product components. Cultural issues related to source. Advanced skill required for patient selection for this therapy.

allows drainage to pass through to the gauze topper. Acute surgical wounds are most likely to be packed with saline-moistened nonwoven gauze and the dressing changed at frequent intervals, usually determined by the surgeon.

Transparent Film Dressings. Self-adhesive, transparent film dressings are occlusive and trap the wound's moisture over the wound, providing a moist environment. The transparent film dressing has been used for small, superficial wounds such as skin tears or for protection of high-risk skin. However, transparent film dressings can be difficult to remove and can cause unnecessary trauma to fragile periwound tissue. You must remove the transparent film with a "lateral pull" technique, in which you support the dressing with one hand while lifting (and breaking the adhesive seal) with the other, instead of just pulling off the dressing. Bearing these factors in mind, you can use transparent film dressing to affix gauze, and it can also function as a secondary dressing or provide autolysis for small wounds.

However, transparent film is particularly useful in securing IVs and other tubing since these dressings tend to provide an occlusive barrier, which does not allow significant moisture-vapour transfer and can potentially create macerated periwound skin.

Transparent film does permit a view of the wound, but some newer dressings, such as clear acrylic absorbent dressings, offer more moisture-vapour transfer capability and longer wear time.

Nonadherent Contact Layer Dressings. A variety of nonadherent dressings is available and provide protection to the fragile granulating tissue while allowing the interstitial fluid and moisture from the wound to evaporate. This provides a moist "like your eyeball" environment that promotes healing. As well, the contact layer can remain undisturbed while a secondary cover dressing can be changed as needed (when saturated or soiled). Early forms of contact layer dressings were tulle (paraffin) or petrolatum jelly, which may decrease the effectiveness of moisture-vapour transfer. Some of the newer petrolatum-based or silicone contact layers are more effective in this regard. These dressings are designed to be placed over the open wound and draped across the intact periwound skin. It is important for wound healing to allow these contact layer dressings to remain in place for a number of days, and change the secondary dressing only as needed.

Soft Silicone Dressings. Soft silicone dressings are composed of silicone that functions as an atraumatic wound contact layer. A main advantage of soft silicone is its removal without causing trauma to the wound bed or the periwound skin. Different types of soft silicone dressings are wound contact layers (useful for skin tears) and absorbent dressings for exudating wounds. Soft silicone dressings are particularly relevant in decreasing pain during dressing change and are especially useful in dealing with fungating wounds or any wound where the periwound skin is fragile, such as in pediatric patients.

Hydrocolloid Dressings. Hydrocolloid dressings have complex formulations of colloidal, elastomeric, and adhesive components. These dressings are adhesive and occlusive. The wound contact layer of the dressing forms a gel as fluid is absorbed and maintains a moist healing environment. Hydrocolloids support healing in clean granulating wounds, autolytically debride necrotic wounds, and are available in a variety of sizes and shapes.

Hydrocolloid dressing has the following characteristics:

- Has minimal absorption capabilities and is best for autolytically debriding a dry or slightly moist wound with fibrinous or necrotic debris
- Maintains wound bed moisture
- Slowly liquefies necrotic debris
- Is impermeable to external bacteria and other contaminants
- Is self-adhesive and conforms to the body well
- Acts as a preventive dressing for high-risk friction areas
- May be left in place for five to seven days

This type of dressing is most useful on shallow to moderately deep wounds. Hydrocolloid dressings should not be used in heavily draining wounds or in full-thickness or infected wounds. Because of the manner in which hydrocolloids interact with the wound bed matter, when the dressing is removed, residue in the wound bed may be confused with pus (colour, odour) until the wound is cleansed. Hydrocolloids are quite adherent to the periwound skin and should be used with caution where the periwound tissue is fragile or friable.

Hydrogel Dressings. Hydrogel dressings donate moisture to the wound bed (hence, the term *hydro*, indicating water) and are gauze or sheet dressings impregnated with water- or glycerin-based amorphous gel. This type of dressing hydrates

wounds and absorbs some smaller amounts of exudate. Hydrogel dressings are for partial-thickness and full-thickness wounds, deep wounds with minimal drainage, necrotic wounds, burns, and radiation-damaged skin. They are very useful in painful wounds because they are soothing to the patient, do not adhere to the wound bed, and cause minimal trauma during dressing removal. Hydrogels should not be used on draining wounds; sheets should not be used on infected wounds. Hydrogels come in a sheet dressing or in a tube. When using hydrogel from a tube, do not squirt gel directly into the wound; rather, use a sterile gauze dressing or sterile implement (e.g., tongue depressor) to apply the gel so that potential contamination of the tube from matter in the wound is avoided.

Hydrogel has the following characteristics:

- Is soothing and reduces pain in the wound
- Provides a moist environment
- Debrides the wound (by softening the necrotic tissue)
- Does not adhere to the wound base and is easy to remove

Foam Dressings. Foam dressings are composed of non-adhesive or adhesive polyurethane foam, are provided as sheets or packing, and come in a variety of sizes and shapes. They are useful for wounds with large amounts of drainage or for autolytic debridement because they can be left intact for up to seven days. Some foam dressings have a “fluid lock” to wick drainage off the wound and periwound skin, which prevents maceration. Furthermore, nonborder foam dressings can be cut to fit around drainage tubes.

Calcium Alginate Dressings. Calcium alginate dressings are manufactured from seaweed and are available in sheet and rope form. The alginate forms a thickened, stronger surface when it comes in contact with wound fluid. These highly absorbent dressings are useful in highly draining wounds and also provide hemostasis in friable tissue. Calcium alginate dressings are bioreabsorbable but should be removed from the wound.

Another type of dressing very useful for highly exudative wounds is hydrofibres, composed of sodium carboxymethylcellulose. These are available in sheets or ribbon and are used in similar situations to the calcium alginates. The main advantage of the hydrofibre dressing is that when exposed to fluid, it becomes a solid gel. This is particularly useful when the wound bed or wound edge is friable, for example, in malignant fungating wounds.

Neither of these dressings should be used on or in dry wounds. Secondary dressing (usually some form of absorbent pad) is required.

Composite Dressings. Composite dressings are a combination of two different dressing types. These multilayered dressings are designed to provide both absorption and autolysis. Composite dressings can remain in place for up to three days.

Topical Treatment for Infected Wounds. Superficially infected wounds require topical dressings to deal with the bacteria within the wound and surrounding tissue. Deep tissue infection requires the addition of antibiotic therapy, which can be determined from wound swab cultures (Sibbald, Woo, et al., 2006). Topical dressings range from hypertonic sodium solutions to silver antimicrobials.

Hypertonic Dressings. Hypertonic dressings contain a high concentration of sodium, which pulls out interstitial fluid, decreases edema to improve blood flow to the tissue surrounding the wound, and establishes a negative environment for bacterial growth. These dressings are available in ribbon, sheet,

or gel form. Some patients find that the hypertonic dressings sting, and they should be changed once a day. Carefully monitor dressings with active ingredients on a daily basis.

Cadexomer Iodine. Cadexomer iodine dressings are available in sheets or a tube and provide the toxicity of iodine in a starch matrix. The iodine downloads into the wound bed in a controlled fashion, targeting only bacteria. The colour change of the dressing indicates its efficacy: it is brown when you apply it and gradually changes to cream-coloured as the iodine is absorbed. This process usually takes 72 hours, so the dressing should be left intact for three days. Changing the dressing more frequently will interfere with the effectiveness of the product. Use large amounts of cadexomer iodine with caution (see product monograph for limits), and do not use in breastfeeding women or patients with thyroid conditions.

Silver Dressings. Silver dressings have antimicrobial effects similar to cadexomer iodine, against approximately 150 different pathogens, including fungal infections, methicillin-resistant *Staphylococcus aureus* (MRSA), and vancomycin-resistant enterococci (VRE). You can use silver dressings in sheet, ribbon, rope, woven, and foam formats in a variety of sizes. The amount of silver in the dressing, which affects the kill rate (speed and sustainability), varies, and silver dressings require moisture to become activated—either from the wound bed exudate or with the use of a scant amount of hydrogel laid down in the base of the wound first. In addition, most silver dressings will require a secondary dressing, and their efficacy ranges from three to seven days, depending on the product. No sensitivity to silver dressings has been reported, but patients do occasionally complain of stinging as the silver is activated. Be aware that some forms of silver dressings may leave a black stain around the periwound skin.

Honey (Medical Grade Leptospermum Honey). Honey has long been known to have antimicrobial properties. As a treatment option for infected or suspected infection in wounds, it is particularly effective as it changes the pH in the wound bed, creating a negative environment for bacterial proliferation and produces a low concentration of hydrogen peroxide, which does not damage the healing tissue. As well as killing bacteria (e.g., MRSA and VRE), it has a significant impact on decreasing wound odour. The medical grade format of Manuka honey is available in a variety of formats. It is particularly useful in pilonidal cysts as it can be applied in a warmed liquefied format directly into the wound, with a hydrofibre and simple cover dressing. The wound can be irrigated and more of the medical grade honey introduced to the wound. Often wounds treated with honey will have an increase in drainage initially and may require more frequent dressing changes.

Negative Pressure Wound Therapy. Negative pressure wound therapy (NPWT) is another modality for dressings. The approach uses a machine that applies localized negative pressure to the surface and margins of the wound, pulling up the base of the wound and enhancing healing rates. It can be very effective, particularly in wounds in which rapid healing is viable, and will enhance patients' quality of life. Although expensive, the method, in the appropriate situation, can significantly increase wound healing, thus decreasing the requirement for health care resources, including hospitalization. Usually these dressings are changed three times a week.

NPWT is also used to enhance the viability of split-thickness skin grafts. Placing it over the graft intraoperatively decreases the ability of the graft to shift and evacuates fluids that build up under the graft (Frantz et al., 2007).

Changing Dressings. When changing a dressing, keep in mind that the characteristics of the wound may have changed. However, be prepared with similar dressings as previously used and know the location of underlying drains or tubing and the type of supplies needed for care of the wound. Poor preparation can result in a break in aseptic technique (see Chapter 32), accidental dislodging of a drain, or unnecessary discomfort to the patient as you search for supplies.

Your judgement in modifying a dressing change procedure is important during wound care. If the character of a wound changes, notify the physician or wound care specialist. Ensure open and clear communication with the physician or advanced practice nurse who documents your interventions, even though you do not require a medical order to change a dressing. If an order is written, it is your responsibility to assess the current status of the wound in relation to the order. Has the wound changed? Would a different dressing be more effective? You will need to communicate this to the physician or advanced practice nurse.

An order to “reinforce dressing prn” (add dressings without removing the original one) is common immediately after surgery, when the surgeon does not want accidental disruption of the suture line or bleeding. The medical or operating room record usually indicates whether drains are present and from what body cavity they drain. After the first dressing change, describe the location of drains and the type of dressing materials and solutions to use in the patient’s care plan.

Clean or Sterile Technique. The body of literature about sterile versus clean dressing techniques is growing. The RNAO guidelines (2011) recommend sterile dressings, good hand-washing, and clean gloves changed between each of the patient’s wounds or when soiled. For surgical wounds, preliminary research indicates no difference in the healing rate of wounds when a clean rather than a sterile dressing change technique is used. Although aseptic or sterile technique is often used for surgical wound care, the most important aspects of this approach are to ensure as clean a field as possible with the use of sterile dressing packs, sterile scissors and forceps, and sterile dressings and gloves.

Preparing for Dressing Change (in Any Care Setting). To prepare a patient for a dressing change, do the following:

- Administer required analgesics so that peak effects occur during the dressing change
- Describe steps of the procedure to lessen patient anxiety
- Gather all supplies required for the dressing change
- Recognize normal signs of healing
- Answer questions about the procedure or the wound

Always consider teaching the patient and family how to change the dressing, particularly in the home care setting. Demonstrate dressing changes to the patient and family and then provide an opportunity for them to practise changing a dressing when you are present. In acute care, by the time the patient is ready to be discharged, wound healing has usually progressed past the point when complications such as dehiscence or evisceration might occur. The AHCPR guidelines (1994) regarding clean dressings in the home setting and disposal of contaminated dressings in the home can be found in Skill 46-3 (shown earlier), which outlines the steps for changing dry and moist dressings.

Packing a Wound. When packing a wound, first assess the size, depth, and shape of the wound, then assess for tunnelling and undermining of the wound. These wound

characteristics will help you determine the size and type of dressing material needed to pack the wound. Many dressing materials, such as alginates, are used to pack wounds. If non-woven gauze is the appropriate dressing material, saturate the gauze with the ordered solution, wring it out, unfold it, and lightly pack it into the wound. The entire wound surface needs to be in contact with part of the moist gauze dressing (see Skill 46-3). As stated in the RNAO guidelines (2011), “keeping the wound moist and the surrounding intact skin dry” (p. 43) will prevent maceration and help maintain a moist wound environment, and when using a dressing “loosely pack any sinus tract or cavity to eliminate dead space” (p. 77). Dead space (e.g., tunnelling) in the wound is not filled with dressing and will allow wound debris to accumulate in that area, which may cause an abscess.

Do not pack the wound too tightly. Overpacking the wound causes pressure on the tissue in the wound bed, decreasing blood flow to the area and preventing healing and wound closure. Document the amount of packing placed in the wound to ensure there is no chance for any packing material to be left in the wound when the dressing is changed.

Securing Dressings. Use tape, ties, a secondary dressing, or gauze net to secure a dressing over a wound site. The choice of anchoring depends on the wound size and location, the presence of drainage, frequency of dressing changes, and patient’s level of activity. Of equal importance is the potential for skin stripping as tape is applied and removed frequently from the same area of skin. Patients with chronic wounds tend to have skin that is fragile and prone to breakdown. Thus, pay attention to the method used in affixing dressings.

If tape must be used, ensure that the periwound skin is not excoriated or at risk of breakdown. Make sure the patient does not have an allergy or sensitivity to tape. Nonallergenic paper and silicone tapes are available to minimize skin reactions. Common adhesive tape adheres strongly to the skin’s surface, whereas elastic adhesive tape compresses closely around pressure bandages and permits more movement of a body part. Skin sensitive to adhesive tape becomes severely inflamed and denuded and, in some cases, even sloughs when the tape is removed. Assess the skin under the tape at each dressing change. If the skin does not remain intact or is irritated, use an alternative solution (e.g., paper or silicone tapes or Montgomery ties).

Tape is available in various widths. Choose the size that sufficiently secures the dressing. Strips of 7.6 cm adhesive tape will likely ensure that a large dressing does not continually slip off. Other options, such as gauze wrap or burn-net dressings, may also be used.

When applying tape, ensure that the skin is dry so that the tape will adhere to several centimeters of skin on both sides of the dressing. Also place tape across the middle of the dressing. When securing the dressing, press the tape gently, exerting pressure away from the wound. With tension occurring in both directions away from the wound, skin distortion and irritation is minimized. Never apply tape over irritated or broken skin. Barrier film or spray can assist with adherence of the tape and protect the periwound skin from breakdown due to tape adhesives.

To remove tape safely, loosen the tape ends and gently pull the outer end parallel with the skin surface toward the wound. Apply light traction to the skin away from the wound as the tape is loosened and removed. The traction minimizes pulling of the skin. If tape covers an area of hair growth, the patient

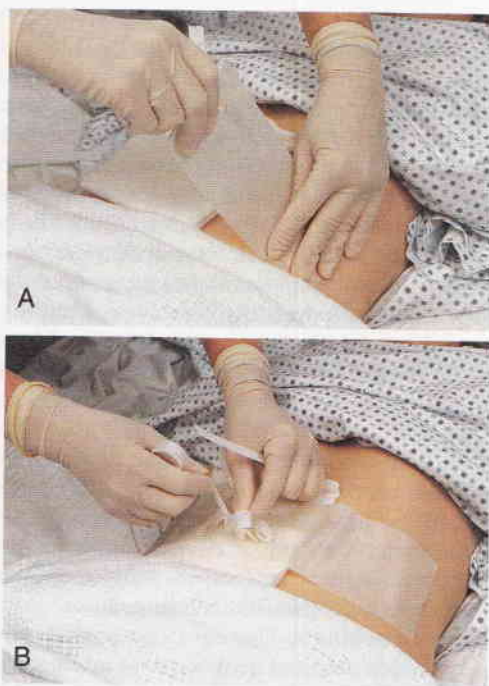


Figure 46-23 Montgomery ties. **A**, Each tie is placed at side of dressing. **B**, Securing ties encloses dressing.

experiences less discomfort if you pull the tape in the direction of hair growth. Adhesive remover can also be used to release the tape from the skin, but can also dry out the skin.

When frequent dressing changes are required, particularly for large abdominal or chest wounds, avoid repeated removal of tape from sensitive skin by using dressings secured with pairs of reusable Montgomery ties (Figure 46-23). Each section consists of a long strip; half contains an adhesive backing to apply to the skin, and the other half folds back and contains a cloth tie to fasten across a dressing and untie at dressing changes.

Comfort Measures. A wound is often painful, depending on the extent of tissue injury and the patient's other medical health issues. Use several techniques to minimize discomfort during wound care. Administration of analgesic medications 30 to 45 minutes before dressing changes (depending on a drug's time of peak action) reduces discomfort. Careful removal of tape, gentle cleansing of wound edges, and careful manipulation of dressings and drains minimize stress on sensitive tissues. Often, propping and positioning the patient with pillows or foam wedges can decrease positioning pain or discomfort, particularly in complex, time-consuming dressing changes.

Surgical or Traumatic Wound Considerations

Basic Skin Cleansing for Surgical or Traumatic Wounds. Cleanse surgical or traumatic wounds by applying noncytotoxic solutions with sterile gauze or by irrigating. The following three principles are important when cleansing an incision or the area surrounding a drain:

1. Cleanse in a direction from the least contaminated area, such as from the wound or incision to the surrounding skin (Figure 46-24) or from an isolated drain site to the surrounding skin (Figure 46-25).

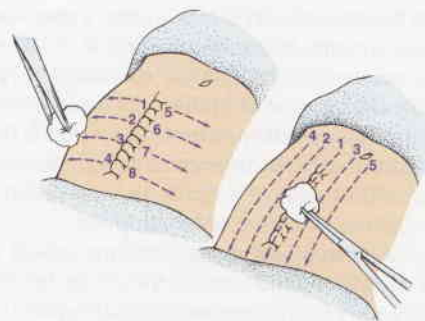


Figure 46-24 Methods for cleansing a wound site.

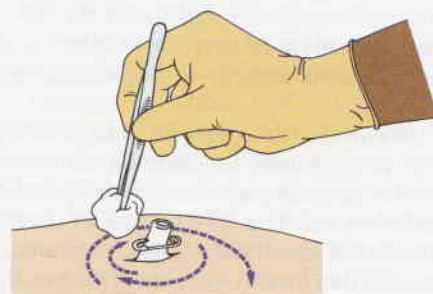


Figure 46-25 Cleansing a drain site.

2. Use gentle friction when applying solutions locally to the skin.
3. When irrigating, allow the solution to flow from the least to most contaminated area (see Skill 46-5).

Never use the same piece of gauze to cleanse across an incision or wound twice. Use gauze to clean the periwound skin, not the open wound. Open wound beds are damaged by the abrasive contact of gauze.

Cleansing Skin and Drain Sites. In cases in which the open drain leaks onto surrounding skin, ensure that the drainage is removed from the skin to avoid maceration or excoriation of the tissue from possibly caustic drainage. You may also need to clean the drain itself on a regular basis to avoid a buildup of potentially contaminated material.

Drain sites are a source of contamination because moist drainage harbours microorganisms. If a wound has a dry incisional area and a moist drain site, use two separate swabs or gauze pads, one to cleanse from the top of the incision toward the drain and one to cleanse from the bottom of the incision toward the drain. To cleanse the area of an isolated drain site, clean around the drain, moving in circular rotations outward from a point closest to the drain. In this situation, the skin near the site is more contaminated than the site itself. To cleanse circular wounds, use the same technique as in cleansing around a drain.

Irrigation. Irrigation is a special way of cleansing wounds. You use an irrigating syringe to flush the area with a constant low-pressure flow of noncytotoxic solution (usually saline). The gentle washing action of the irrigation cleanses a wound of exudate and debris. Irrigations are particularly useful for open, deep wounds. "*Irrigate, irrigate, irrigate . . . and then irrigate some more.*" However, make sure that the irrigant is not left pooled in the wound bed (usually by repositioning the patient to allow gravity to assist in drainage).

Wound Irrigation. Irrigation of an open wound requires sterile technique. Use a 35 mL syringe with a 19-gauge angiocatheter (Rolstad & Ovington, 2007) or a single-use bottle of normal saline to deliver the solution, so as not to damage healing wound tissue. Never occlude a wound opening with a syringe, because this results in the introduction of irrigating fluid into a closed space. In this case, the pressure of the fluid causes tissue damage and discomfort. Always irrigate a wound with the syringe tip over but not in the drainage site. Make sure fluid flows directly into the wound and not over a contaminated area before entering the wound. Skill 46-4 lists steps for wound irrigation.

Sutures. A surgeon closes a wound by bringing the wound edges as close together as possible to reduce scar formation. Proper wound closure involves control of bleeding and minimal trauma and tension to tissues.

Sutures are threads or metal used to sew body tissues together. The patient's history of wound healing, the site of surgery, the tissues involved, and the purpose of the sutures determine choice of suture material. For example, if the patient has had repeated surgery for an abdominal hernia, wire sutures may be used to provide greater strength for wound closure. In contrast, a small laceration of the face calls for use of very fine polyester sutures to minimize scar formation.

Sutures are available in a variety of materials, including silk, steel, cotton, linen, wire, nylon, and polyester. Steel staples are a common type of outer skin closure that cause less trauma to tissues than do sutures, while providing extra strength. Tape closures such as Steri-Strips applied over the wound to keep the edges closed are also common.

Sutures are placed within tissue layers in deep wounds as well as superficially, as the final means for wound closure. Deep sutures are usually an absorbable material that will disappear over time; however, sutures are foreign bodies and, thus, are capable of causing local inflammation. The surgeon tries to minimize tissue injury by using the finest suture possible and the smallest number necessary.

Suture Removal. Policies vary within institutions as to who is able to remove sutures. If it is appropriate for the nurse to remove them, an order is required. Special scissors with curved cutting tips or special staple removers slide under the skin closures for suture removal (Figure 46-26). If the suture line appears to be healing better in certain locations than in

others, the surgeon may choose to have only some sutures removed (e.g., every other one).

To remove staples, simply insert the tips of the staple remover under each wire staple. While slowly closing the ends of the staple remover together, you squeeze the centre of the staple with the tips, freeing the staple from the skin (see Figure 46-26).

To remove sutures, first check the type of suturing used (Figure 46-27). With intermittent suturing, the surgeon ties each individual suture made in the skin. Continuous suturing, as the name implies, is a series of sutures with only two knots, one at the beginning and one at the end of the suture line.



Figure 46-26 Staple remover.

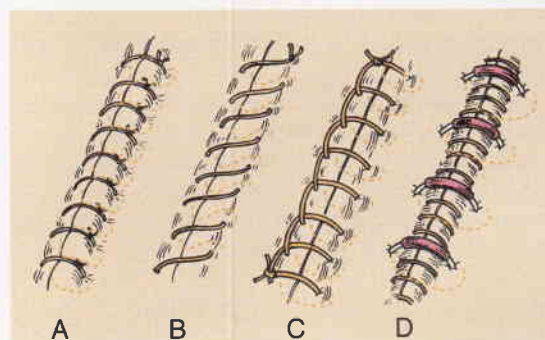


Figure 46-27 Examples of suturing methods. A, Intermittent. B, Continuous. C, Blanket continuous. D, Retention.

► SKILL 46-4 Performing Wound Irrigation

video

Delegation Considerations

The skill of wound irrigation should not be delegated to unregulated care providers (UCPs). In the case of a chronic wound, you can delegate cleansing of the wound with clean technique to a UCP. Assessment of any wound, care of acute new wounds, and evaluation of wound irrigation is the responsibility of the nurse, however, and is never delegated. When a wound is stable or requires clean irrigation, instruct the UCP to do the following:

- Report any change in wound appearance or increased wound drainage to the nurse
- Use proper clean technique to avoid cross-contamination from irrigation syringes and equipment

Equipment

- Irrigant or cleansing solution (volume 1.2 to 2 times the estimated wound volume)
- Irrigation delivery system, depending on amount of pressure desired:
 - Sterile 35-mL irrigation syringe with sterile soft angiocatheter or 19-gauge needle (AHCPR, 1994) or
 - Whirlpool or hand-held shower
- Disposable gloves and sterile gloves (check agency policy)
- Waterproof underpad, if needed
- Dressing supplies
- Disposable waterproof bag
- Gown, if risk of spray
- Goggles, and/or mask if risk of spray

Continued

► SKILL 46-4 Performing Wound Irrigation—cont'd



Procedure

STEPS

1. Assess patient's level of pain. Administer prescribed analgesic 30 to 45 minutes before starting wound irrigation procedure.
2. Review medical record for physician's prescription for irrigation of open wound and type of solution to be used.
3. Assess recent recording of signs and symptoms related to patient's open wound.
 - A. Condition of skin and wound
 - B. Elevation of body temperature
 - C. Drainage from wound (amount, colour)
 - D. Odour
 - E. Consistency of drainage
4. Explain procedure of wound irrigation and cleansing.
5. Perform hand hygiene.
6. Position patient comfortably to permit gravitational flow of irrigating solution through wound and into collection receptacle. Position patient so that wound is vertical to collection basin.
7. Warm irrigation solution to approximate body temperature.
8. Form cuff on waterproof bag and place it near bed.
9. Close room door or bed curtains.
10. Apply gown, goggles, or mask, if needed.
11. Put on disposable gloves, remove soiled dressing, and discard in waterproof bag. Discard gloves.
12. Prepare equipment; open sterile supplies.
13. Put on sterile gloves (check agency policy).
14. Irrigate wound with wide opening:
 - A. Fill 35 mL syringe with irrigation solution.
 - B. Attach 19-gauge needle or angiocatheter.
 - C. Hold syringe tip 2.5 cm above upper end of wound and over area being cleansed.
 - D. Using continuous pressure, flush wound; repeat steps 14A, 14B, and 14C until solution draining into basin is clear.
15. Irrigate deep wound with very small opening:
 - A. Attach soft angiocatheter to filled irrigating syringe.
 - B. Lubricate tip of catheter with irrigating solution; then gently insert tip of catheter and pull out about 1 cm.
 - C. Using slow, continuous pressure, flush wound.
16. Cleanse wound with hand-held shower:
 - A. With patient seated comfortably in shower chair, adjust spray gentle flow; water temperature should be warm.

RATIONALE

- Discomfort may be related directly to the wound or indirectly to muscle tension or immobility. Increased comfort permits patient to move more easily and be positioned to facilitate wound irrigation.
- Open wound irrigation requires medical order, including type of solution to use.
- Data are used as baseline to indicate change in condition of wound (Sibbald, Orsted, et al., 2006).
- Elevated temperature may indicate response to infection.
- Amount will decrease as healing takes place.
- Strong odour may indicate infection.
- Leukocytes produce thick drainage.
- Information will reduce patient's anxiety.
- Transmission of microorganisms is reduced.
- Directing solution from top to bottom of wound and from clean to contaminated area prevents further infection. Positioning patient during planning stage provides bed surfaces for later preparation of equipment.
- Warmed solution increases comfort and reduces vascular constriction response in tissues.
- Cuffing helps to maintain large opening, thereby permitting placement of contaminated dressing without touching refuse bag itself.
- Privacy is maintained.
- Gown, goggles, and mask protect you from splashes or sprays of blood and body fluids.
- Transmission of microorganisms is reduced.
- Flushing wound helps remove debris and facilitates healing by secondary intention.
- Angiocatheter provides ideal pressure for cleansing and removal of debris.
- Holding the tip above the wound prevents syringe contamination. Careful placement of the syringe prevents unsafe pressure of the flowing solution.
- Clear solution indicates that all debris has been removed.
- Catheter permits direct flow of irrigant into wound. Expect wound to take longer to empty when opening is small.
- Tip is not in fragile inner wall of wound.
- Sterile solution will not be contaminated.
- Method is useful for patients able to shower with assistance or independently. Shower may be accomplished at home. A shower table is helpful for bed-bound or acutely ill patients.

Critical Decision Point: Caution: Splashing may occur during this step.

► SKILL 46-4 Performing Wound Irrigation—cont'd**video**

- B. Cover showerhead with clean washcloth, if needed.
- C. Shower for 5 to 10 minutes with showerhead 30 cm from wound.

Critical Decision Point: Consider culturing a wound if it has a foul and purulent odour, if inflammation surrounds the wound, if a nondraining wound begins to drain, or if the patient is febrile.

17. Obtain cultures, if needed, after cleansing with nonbacteriostatic saline.
 18. Dry wound edges with gauze; dry patient, if shower or whirlpool is used.
 19. Apply appropriate dressing (see Skill 46-3 and Box 46-13).
 20. Remove gloves and, if worn, mask, goggles, and gown.
 21. Dispose of equipment and soiled supplies. Perform hand hygiene.
 22. Assist patient to comfortable position.
 23. Assess type of tissue in the wound bed.
 24. Inspect dressing periodically.
 25. Evaluate skin integrity.
 26. Observe patient for signs of discomfort.
 27. Observe for presence of retained irrigant.
- Routine culturing of open wounds is not recommended in the AHCPR guidelines (1994). If required, quantitative bacterial cultures (tissue biopsy or wound fluid by needle aspiration) should be performed rather than swab cultures, which often detect only surface bacterial contaminants.
 - Maceration of surrounding tissue is prevented if excess moisture is dried.
 - Protective barrier and healing environment for wound is maintained.
 - Transfer of microorganisms is prevented.
 - Transmission of microorganisms is reduced.
 - Wound healing progress is identified and type of wound cleansing needed is determined.
 - Patient's response to wound irrigation and need to modify plan of care are determined.
 - Whether extension of wound has occurred is determined.
 - Patient's pain should not increase as a result of wound irrigation.
 - Retained irrigant is a medium for bacterial growth, and subsequent infection may occur.

Unexpected Outcomes

Wound does not appear to heal

Wound drainage increases

Related Interventions

- Obtain wound culture.
- Notify physician, who may change frequency of dressing, irrigation, or both.
- Apply more absorbent gauze.
- Increase the frequency of irrigation.

Recording and Reporting

- Record wound irrigation and patient response on progress notes.
- Immediately report to attending physician any evidence of fresh bleeding, sharp increase in pain, retention of irrigant, or signs of shock.
- At change of shift, report expected and unexpected outcomes that have occurred.

Home Care Considerations

- Teach patient and caregiver how to make normal saline, especially if cost is an issue. Normal saline can be made by using 10 mL of salt in 1 L of boiling water (Barr, 1995).
- Tell patient and caregiver that because normal saline has no preservatives, it should be discarded 24 to 48 hours after it is first opened or made (Barr, 1995).

Retention sutures are placed more deeply than skin sutures, and nurses may or may not remove them, depending on agency policy.

The manner in which the suture crosses and penetrates the skin determines the method for removal. Never pull the visible portion of a suture through underlying tissue. Sutures on the skin's surface harbour microorganisms and debris, but the portion of the suture beneath the skin is sterile. Pulling the contaminated portion of the suture through tissues may lead to infection. Clip suture materials as close to the skin edge on one side as possible and pull the suture through from the other side (Figure 46-28).

Drainage Evacuation. When drainage interferes with healing, you achieve drainage evacuation by using either a

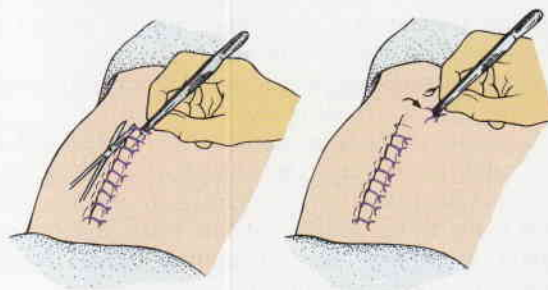


Figure 46-28 Removal of intermittent suture. **A**, Cut the suture as close to the skin as possible, away from the knot. **B**, Remove the suture and never pull the contaminated stitch through the tissues.

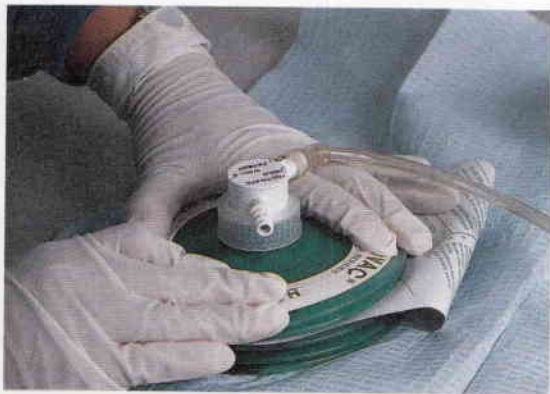


Figure 46-29 Setting the suction on a drainage evacuator. 1. With the drainage port open, the lever on the diaphragm is raised. 2. Push straight down on the lever to lower the diaphragm. 3. Closure of the port prevents escape of air and creates vacuum pressure.

drain alone or a drainage tube with continuous suction. Apply special skin barriers, including hydrocolloid dressings, similar to those used with ostomies (see Chapter 44), around drain sites. The skin barriers are soft material applied to the skin with adhesive. Drainage flows on the barrier but not directly on the skin.

Drainage evacuators (Figure 46-29) are convenient, portable units that connect to tubular drains lying within a wound bed and exert a safe, constant, low-pressure vacuum to remove and collect drainage. Ensure suction is exerted and connection points between the evacuator and tubing are intact. After the evacuator collects drainage, assess for volume and character every shift and as needed. When the evacuator fills, measure output by emptying the contents into a graduated cylinder and immediately reset the evacuator to apply suction.

Bandages and Binders. A simple gauze dressing is often not enough to immobilize or provide support to a wound. Binders and bandages applied over or around dressings provide extra protection and therapeutic benefits by doing the following:

- Creating pressure over a body part (e.g., an elastic pressure bandage applied over an arterial puncture site)
- Immobilizing a body part (e.g., an elastic bandage applied around a sprained ankle)
- Supporting a wound (e.g., an abdominal binder applied over a large abdominal incision and dressing)
- Reducing or preventing edema (e.g., a well-supporting bra to minimize breast discomfort after delivery of a baby)
- Securing a splint (e.g., a bandage applied around hand splints for correction of deformities)
- Securing dressings (e.g., elastic webbing applied around leg dressings after a vein stripping)

Bandages are available in rolls of various widths and materials, including gauze, elasticized knit, elastic webbing, flannel, and muslin. Gauze bandages are lightweight and inexpensive, conform easily to the contours of the body, and permit air circulation to prevent skin maceration. Elastic bandages conform well to body parts but also exert pressure.

Principles for Applying Bandages and Binders. Correctly applied bandages and binders do not cause injury to underlying and nearby body parts or create discomfort for the patient. For example, a chest binder should not be so tight as to restrict

chest wall expansion. Before applying a bandage or binder, the following are your responsibilities:

- Inspecting the skin for abrasions, edema, discolouration, or exposed wound edges
- Covering exposed wounds or open abrasions with a sterile dressing
- Assessing the condition of underlying dressings and changing them, if soiled
- Assessing the skin of underlying areas that will be distal to the bandage for signs of circulatory impairment (coolness, pallor or cyanosis, diminished or absent pulses, swelling, numbness, and tingling) to provide a means for comparing changes in circulation after bandage application

After applying a bandage, you need to assess, document, and immediately report changes in circulation, skin integrity, comfort level, and body function (e.g., ventilation, movement). When you apply the bandage, readjust it, as necessary. Make sure you explain to the patient that the binder may feel relatively firm or tight. Carefully assess a bandage to be sure that it is properly applied (according to the written order) and is providing therapeutic benefit. Replace any soiled bandages.

Binder Application. Binders are especially designed for the body part to be supported. Most binders are made of elastic or cotton. The most common types of binders are the abdominal binder and breast binder (Skill 46-5). Well-fitting bras are now replacing breast binders. Both provide support after breast surgery or exert pressure to reduce lactation in a woman after childbirth.

Abdominal Binders. An abdominal binder supports large abdominal incisions that are vulnerable to tension or stress as the patient moves or coughs. Secure an abdominal binder with safety pins, Velcro strips, or metal stays.

Bandage Application. Rolls of bandage secure or support dressings over irregularly shaped body parts. Each roll has a free outer end and a terminal end at the centre of the roll. The rolled portion of the bandage is its body, and its outer surface is placed against the patient's skin or dressing. Skill 46-6 describes the steps for applying an elastic bandage.

The Whole Person, the Whole Team

Skin management and wound care require the involvement of the health care team because the factors that create skin breakdown, such as pressure and nutrition, are assessed and treated by experts within the health care team: physiotherapist, occupational therapist, dietitian, nurse, physician, social worker, and pharmacist. In addition, the wound belongs to the patient and you need to recognize the impact of the individual on both the development and healing potential of a wound.

Case Study. Mr. John Purata is an 84-year-old man who has returned to his home in a long-term care facility where you are looking after the ulcer on his sacrum, developed during his stay in acute care after hip replacement surgery. Mr. Purata has been too tired to get up for meals, and you have noticed that his nutritional status is declining. Although he is on a pressure-relief surface, Mr. Purata tends to lie on his back. You have mentioned to him the importance of repositioning to assist in healing the wound, but he merely closes his eyes and tells you he is fine the way he is. When you and the other staff in the long-term care facility try to get him up to walk, Mr. Purata is hesitant and requires a great deal of coaching and encouragement to walk even a few steps. He then says he is too tired to

SKILL 46-5 Applying an Abdominal or Breast Binder**Delegation Considerations**

The skills of applying a binder (abdominal or breast) can be delegated to unregulated care providers (UCPs). You are responsible for wound assessment and the evaluation of wound care interventions. Also complete an assessment of the patient's ability to breathe deeply, cough effectively, and move independently; assess skin for irritation or abrasion; assess the incision or wound and dressing; and assess the patient's comfort level before a binder or sling is applied for the first time. When delegating the skill of applying a binder, instruct the UCP to do the following:

- Immediately report any change in the patient's respiratory status
- Report an increase in wound drainage
- Report changes in skin integrity under or adjacent to the binder
- Remove the binder at prescribed intervals

Equipment

- Disposable gloves, if wound drainage is present
- Abdominal binder:
- Correct size cloth or elastic straight binder
- Safety pins (6 to 8), unless Velcro closure or metal fasteners are attached
- Breast binder:
- Correct size binder
- Safety pins (approximately 12), unless Velcro closure is attached

Procedure**STEPS**

1. Observe patient with need for support of thorax or abdomen. Observe ability to breathe deeply and cough effectively.
2. Review medical record, if medical prescription for particular binder is required, and reasons for application.
3. Inspect skin for actual or potential alterations in integrity. Observe for irritation, abrasion, skin surfaces that rub against each other, or allergic response to adhesive tape used to secure dressing.
4. Inspect any surgical dressing.

RATIONALE

- Baseline assessment determines patient's ability to breathe and cough. Impaired ventilation of lungs can lead to alveolar atelectasis and inadequate arterial oxygenation.
- Application of supportive binders may be used on nursing judgement. In some situations, physician input is required.
- Actual impairments in skin integrity can be worsened with application of a binder. Binder can cause pressure and excoriation.
- Dressing replacement or reinforcement precedes application of any binder.

Critical Decision Point: Dressing should be clean and dry, and incision or wound should be entirely covered by dressing.

5. Assess patient's comfort level, using analogue scale of 0 to 10 (see Chapter 41), noting any objective signs and symptoms of pain.

- Data will determine effectiveness of binder placement.

Critical Decision Point: Expect patient in moderate to severe pain to have diaphoresis, tachycardia, and elevated blood pressure.

6. Gather necessary data regarding size of patient and appropriate binder.
7. Explain procedure to patient.
8. Teach skill to patient or significant other.
9. Perform hand hygiene and apply gloves (if likely to contact wound drainage).
10. Close curtains or room door.
11. Apply binder.
 - A. Abdominal binder:
 - (1) Position patient in supine position with head slightly elevated and knees slightly flexed.
 - (2) Fanfold far side of binder toward midline of binder.
 - (3) Instruct and help patient to roll away from you toward raised side rail while firmly supporting abdominal incision and dressing with hands.
 - (4) Place fanfolded ends of binder under patient.
 - (5) Instruct or assist patient to roll over folded ends.
 - (6) Unfold and stretch ends out smoothly on far side of bed.
 - (7) Instruct patient to roll back into supine position.
 - (8) Adjust binder so that supine patient is centred over binder using symphysis pubis and costal margins as lower and upper landmarks.

- Proper fit of binder will be ensured.
- Patient will understand and be more cooperative.
- Anxiety is reduced and continuity of care after discharge is ensured.
- Transmission of microorganisms is reduced.
- Patient's comfort and dignity are maintained.
- Muscular tension on abdominal organs is minimized.
- Patient's time in uncomfortable position is reduced.
- Pain and discomfort is reduced.
- Placement and centring of binder is accomplished with minimal discomfort.
- Skin integrity and comfort is maintained.
- Chest expansion and adequate wound support is facilitated when binder is closed.
- Support from binder is centred over abdominal structures, which reduces incidence of decreased lung expansion.

Critical Decision Point: Cover any exposed areas of an incision or wound with sterile dressing.

► SKILL 46-5 Applying an Abdominal or Breast Binder—cont'd

- (9) Close binder. Pull one end of binder over centre of patient's abdomen. While maintaining tension on that end of binder, pull opposite end of binder over centre and secure with Velcro closure tabs, metal fasteners, or horizontally placed safety pins.

B. Breast binder:

- (1) Assist patient in placing arms through binder's armholes.
 - (2) Assist patient to supine position in bed.
 - (3) Pad area under breasts, if necessary.
 - (4) Using Velcro closure tabs or horizontally placed safety pins, secure binder at nipple level first. Continue closure process above and then below nipple line until entire binder is closed.
 - (5) Make appropriate adjustments, including individualizing fit of shoulder straps and pinning waistline darts to reduce binder size.
 - (6) Instruct and observe skill development in self-care related to reapplying breast binder.
12. Remove gloves and perform hand hygiene.
 13. Assess patient's comfort level, using analogue scale of 0 to 10, noting any objective signs and symptoms.
 14. Adjust binder, as necessary.
 15. Observe site for skin integrity, circulation, and characteristics of the wound. (Periodically remove binder and surgical dressing to assess wound characteristics.)
 16. Assess patient's ability to breathe properly.
 17. Identify patient's need for assistance with activities such as combing hair.

- Continuous wound support and comfort is provided.
- Binder placement process is made easier for patient.
- Supine positioning facilitates normal anatomical position of breasts; facilitates healing and comfort.
- Skin contact with undersurface is prevented.
- Horizontal placement of pins may reduce risk of uneven pressure or localized irritation.
- Support to patient's breasts is maintained.
- Self-care is an integral aspect of discharge planning. Skin integrity and comfort level goals are ensured.
- Cross-infections are prevented.
- Effectiveness of binder placement is determined. Binders should not increase discomfort.
- Comfort and chest expansion is promoted.
- Binder should not result in complication to skin, wound, or underlying organs.
- Any impaired ventilation and potential pulmonary complications are identified.
- Mobility of upper extremities may be limited, depending on severity and location of incision.

Unexpected Outcomes*Patient's pain increases**Patient develops impaired skin integrity under the binder***Related Interventions**

- Remove binder and assess wound.
- Reapply binder using less pressure.
- Remove binder.
- Initiate skin care measure to heal affected site.

Recording and Reporting

- Report any skin irritation at between-shift report.
- Record application of binder, condition of skin, circulation, integrity of dressing, and patient's comfort level.
- Report ineffective lung expansion to physician immediately.

Home Care Considerations

- Abdominal and breast binders can be washed and hung to dry.
- Instruct caregiver to avoid excessive pressure with binder application.

► SKILL 46-6 Applying an Elastic Bandage**Delegation Considerations**

The application of an elastic bandage can be delegated to UCPs. You are responsible for wound assessment and the evaluation of the wound. In addition, you should assess for adequate circulation to the extremity distal to the elastic bandage (e.g., pulse, skin temperature, capillary refill). When delegating this skill to a UCP, instruct about any restrictions that the patient might have (e.g., unable to independently raise leg or independently roll over). Also instruct the UCP to report the following:

- Any change in the skin colour of the patient's injured extremity
- Any increases in the patient's pain

Equipment

- Correct width and number of bandages
- Safety pins, clips, or adhesive tape
- Disposable gloves, if wound drainage is present

► SKILL 46-6 Applying an Elastic Bandage—cont'd

Procedure

STEPS

1. Perform hand hygiene and apply gloves, if needed. Inspect skin for alterations in integrity as indicated by abrasions, discolouration, chafing, or edema. (Look carefully at bony prominences.)
2. Inspect surgical dressing. Remove gloves and perform hand hygiene.
3. Observe adequacy of circulation (distal to bandage) by noting surface temperature, skin colour, and sensation of body parts to be wrapped.
4. Review medical record for specific orders related to application of elastic bandage. Note area to be covered, type of bandage required, frequency of change, and previous response to treatment.
5. Identify patient's and primary caregiver's present knowledge level of skill, if bandaging will be continued at home.
6. Explain procedure to patient.
7. Teach skill to patient or primary caregiver.
8. Perform hand hygiene and apply gloves if drainage is present.
9. Close room door or curtains.
10. Help patient to assume comfortable, anatomically correct position.

RATIONALE

- Altered skin integrity contraindicates the use of elastic bandages.
- Surgical dressing replacement or reinforcement precedes application.
- Comparison of area before and after application of bandage is necessary to ensure continued adequate circulation. Impairment of circulation may result in coolness to touch when compared with opposite side of body, cyanosis or pallor of skin, diminished or absent pulses, edema or localized pooling, and numbness or tingling of part.
- Specific prescription may direct procedure, including factors such as extent of application (e.g., toe to knee, toe to groin) and duration of treatment.
- Planning and teaching should be individualized.
- Increased knowledge promotes cooperation and reduces anxiety.
- Anxiety is reduced and continuity of care after discharge is ensured.
- Transmission of microorganisms is reduced.
- Patient's comfort and dignity are maintained.
- Alignment is maintained, and musculoskeletal deformity is prevented.

Critical Decision Point: Bandages applied to lower extremities are applied before patient sits or stands. Elevation of dependent extremities for 20 minutes before bandage application will enhance venous return.

11. Hold roll of elastic bandage in dominant hand and use other hand to lightly hold beginning of bandage at distal body part. Continue transferring roll to dominant hand as bandage is wrapped.

- Appropriate and consistent bandage tension is maintained.

Critical Decision Point: Toes or fingertips should be visible for follow-up circulatory assessment.

12. Apply bandage from distal point toward proximal boundary using variety of turns to cover various shapes of body parts.
13. Unroll and very slightly stretch bandage.
14. Overlap turns by one-half to two-thirds width of bandage roll.
15. Secure first bandage with clip or tape before applying additional rolls.
16. Apply additional rolls without leaving any uncovered skin surface. Secure last bandage applied.
17. Remove gloves, if worn, and perform hand hygiene.
 - A. Assess distal circulation when bandage application is complete and at least twice during eight-hour period.
 - B. Observe skin colour for pallor or cyanosis.
 - C. Palpate skin for warmth.
 - D. Palpate pulses and compare bilaterally.
 - E. Ask if patient is aware of pain, numbness, tingling, or other discomfort.
 - F. Observe mobility of extremity.
18. Have patient demonstrate bandage application.

- Bandage is applied in a manner that conforms evenly to body part and promotes venous return.
- Uniform bandage tension is maintained.
- Uneven bandage tension and circulatory impairment is prevented.
- Wrinkling and loose ends are prevented.
- Transmission of microorganisms is reduced.
- Early detection and management of circulatory impairment ensures healthy neurovascular status.
- Neurovascular changes indicate impaired venous return.
- Joint immobility is determined; if bandage is too tight, movement will be restricted.
- Return demonstration documents learning.

Continued

► SKILL 46-6 Applying an Elastic Bandage—cont'd

Unexpected Outcomes

Impaired circulation distal to elastic bandage

Break in skin under elastic bandage

Inability of patient to change dressing

Related Interventions

- Release bandage.
- Palpate extremity and assess pulse, temperature, and capillary refill.
- Reapply dressing with less pressure.
- Remove bandage.
- Reapply bandage with less pressure.
- Determine barriers to applying bandage.
- Explore options (e.g., different type of dressing).

Recording and Reporting

- Document condition of the wound, integrity of dressing, application of bandage, circulation, and patient's comfort level.
- Report any changes in neurological or circulatory status to the nurse in charge or physician.

Home Care Considerations

- Instruct patient or caregiver not to secure bandages too tightly, which interferes with circulation.
- Elastic bandages that are used to reduce swelling are best applied to the feet in the morning, before getting out of bed.
- Always remove an elastic bandage daily and inspect the area.

go further and asks to go back to bed. He is frequently lying in bed, with eyes closed and the lights dim. His daughter and son are concerned that he seems to have lost his "get up and go" attitude. The wound is not improving, and you are concerned.

- What are the key issues that need to be addressed?
- What members of the health care team need to be involved?
- What would be realistic goals for Mr. Purata?
- How would you develop a plan of care for this patient?

❖ Evaluation

You evaluate nursing interventions for reducing and treating pressure ulcers by determining the patient's response to nursing therapies and whether the patient achieved each goal (Figure 46-30). To evaluate outcomes and responses to care, you measure the effectiveness of interventions. The optimal outcomes are to prevent injury to the skin and tissues, reduce injury to the skin and underlying tissues, and restore skin integrity.

Because each patient has different risk factors for impaired skin integrity, you need to individualize nursing interventions. Patients with minimal mobility impairments or relatively stable health status need only a few measures.

Patients with impaired skin integrity need assessment on an ongoing basis for factors that contribute to skin breakdown. This includes a comprehensive skin assessment and a wound assessment using a validated risk assessment tool. Assessment provides the foundation for the plan of care and is critical for monitoring the effectiveness of the plan (Nix, 2007).

Include the patient and the caregiver in the assessment process. Determine what they know about impaired skin integrity, and develop a plan of care to provide education. Chronic wounds such as pressure ulcers take time to heal, and it is likely that the patient will be in the home or long-term care setting with the pressure ulcer.

If the identified outcomes are not met for a patient with impaired skin integrity, questions to ask include the following:

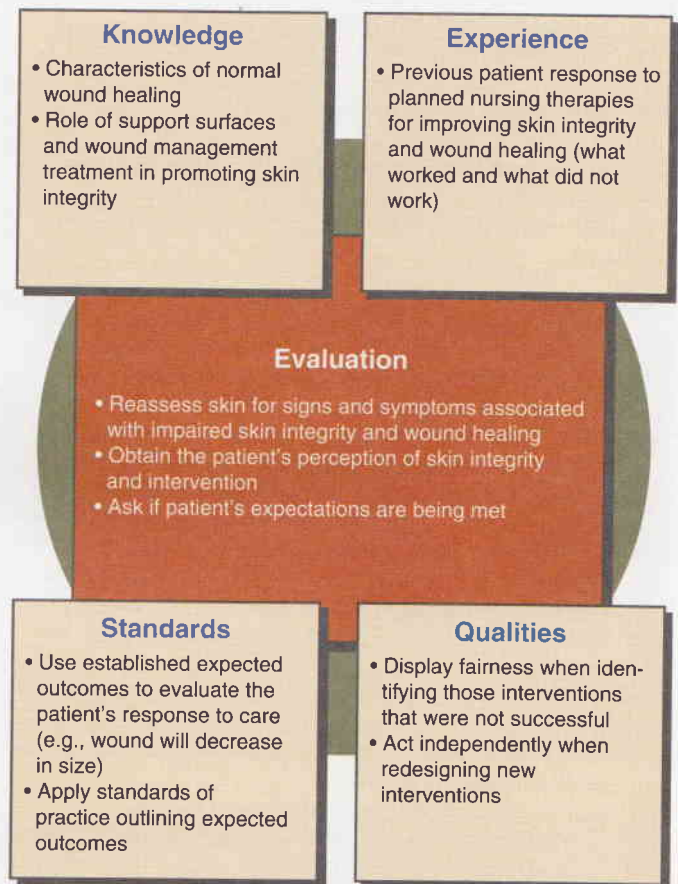


Figure 46-30 Critical thinking model for skin integrity and wound care evaluation.

- Was the etiology of the skin impairment addressed? Were the pressure, friction, shear, and moisture components identified, and did the plan of care decrease the contribution of each of these components?
- Was wound healing supported by providing the wound base with a moist protected environment?

- Were issues such as nutrition assessed and a plan of care developed that provided the patient with the calories to support healing?

Finally, evaluate the need for additional referrals to other experts in wound management, such as occupational therapists, dietitians, and wound care specialists. Care of the patient with a pressure ulcer requires a multidisciplinary team approach.

✦ KEY CONCEPTS

- Prevention of skin breakdown is a major nursing focus for all patients, irrespective of their age or the health care setting.
- Patients should be assessed for risk of skin breakdown with the use of a validated risk assessment tool, such as the Braden Risk Assessment Tool, on admission to care and subsequently at least once per week.
- Alterations in mobility, sensory perception, level of consciousness, and nutrition, as well as the presence of moisture, increase the risk of pressure ulcer development.
- Preventive skin care is aimed at controlling external pressure on bony prominences and keeping the skin clean, well lubricated, hydrated, and free of excess moisture.
- Proper positioning (the 30-degree rule) reduces the effects of pressure and guards against shearing force.
- Wound assessment requires a description of the appearance of the wound base, size (length × width × depth), presence of exudate, and the periwound skin condition.
- Moist wound-healing approaches are based on evidence and support the healing cycle of wounds.
- Wounds require pressure off-loading, adequate nutrition and hydration, blood flow, and an absence of infection to heal.
- Arterial, venous, and diabetic wounds are often the result of impaired peripheral circulation to the extremities.
- Wound irrigation should be at room or body temperature and provide 4 to 15 psi of pressure to avoid damaging fragile granulating tissue.
- Therapeutic beds and mattresses redistribute the effects of pressure; however, base selection on assessment data to identify the best bed for individual needs.
- Cleansing and topical agents used to treat pressure ulcers vary according to the stage of the pressure ulcer and condition of the wound bed. Assessment of the ulcer will enable you to select proper skin care agents.
- Direct nutritional interventions at improving wound healing through increasing protein and calorie levels, as required.
- When extensive tissue loss occurs, a wound heals by secondary intention.
- The chances of wound infection are greater when the wound contains dead or necrotic tissue, when foreign bodies lie on or near the wound, and when the blood supply and tissue defences are reduced.
- The principles of wound first aid include control of bleeding, cleansing, and protection.
- The layers of a dry dressing absorb drainage and prevent the entrance of bacteria.
- A moist environment supports wound healing.
- When cleansing wounds or drain sites, clean from the least to most contaminated area, away from wound edges.
- Apply a bandage or binder in a manner that does not impair circulation or irritate the skin.

✦ CRITICAL THINKING EXERCISES

Mrs. Stein, who is 76 years of age, is at postoperative day 7 after a total hip replacement. She developed redness and oozing of foul-smelling, tan-coloured drainage from the hip incision on postoperative day 4. Significant medical history includes arthritis and mild hypertension. Because of surgical pain at the incision site, she did not easily transfer from her bed to the chair. Now on day 7, she notes some pain at the incision and complains of a painful, burning sensation in the sacral region. She is continent of urine and stool but continues to “scoot” over to the side of the bed when preparing for bed-to-chair transfers.

1. The staples from the surgical incision were removed and an order was written for a moist saline gauze dressing to be applied to the area three times a day. Would this be the approach that best supports wound healing? Provide a rationale and suggest alternative approaches. When the dressing is removed, what are the critical factors to assess?
2. A head-to-toe skin assessment is done per institutional policy on a daily basis. At the most recent assessment, redness was noted over the sacral area, and on direct examination, a small area of denuded tissue was noted. The involved area has minimal depth and a red, moist base. How would you describe the impairment in skin integrity in your charting?
3. What will you include in your plan of care to address the impairment in skin integrity in the sacral area?
4. Mrs. Stein will be discharged tomorrow. What issues must be assessed regarding her care before discharge? Explain why those issues are of importance.

✦ REVIEW QUESTIONS

1. When repositioning an immobile patient, you notice redness over a bony prominence. When the area is assessed, the red spot blanches with a fingertip touch, indicating
 1. A local skin infection requiring antibiotics
 2. This patient has sensitive skin and requires special bed linen
 3. A stage III pressure ulcer needing the appropriate dressing
 4. Reactive hyperemia, a reaction that causes the blood vessels to dilate in the injured area
2. This type of pressure ulcer is an observable, pressure-related alteration of intact skin, whose indicators, compared with an adjacent or opposite area on the body, may include changes in one or more of the following: skin temperature (warmth or coolness), tissue consistency (firm or beefy feel), and sensation (pain or itching).
 1. Stage I
 2. Stage II
 3. Stage III
 4. Stage IV
3. When obtaining a wound culture to determine the presence of a wound infection, the specimen should be taken from the
 1. Necrotic tissue
 2. Wound drainage
 3. Drainage on the dressing
 4. Wound after it has first been cleansed with normal saline

4. Postoperatively, the patient with a closed abdominal wound reports a sudden "pop" after coughing. When you examine the surgical wound site, the sutures are open and pieces of small bowel are noted at the bottom of the now opened wound. The correct intervention would be to
 1. Allow the area to be exposed to air until all drainage has stopped
 2. Place several cold packs over the areas, protecting the skin around the wound
 3. Cover the areas with sterile saline-soaked towels and immediately notify the surgical team; this is likely to indicate a wound evisceration
 4. Cover the area with sterile gauze, place a tight binder over the areas, and ask the patient to remain in bed for 30 minutes because this is a minor opening in the surgical wound and should reseal quickly
5. Serous drainage from a wound is defined as
 1. Fresh bleeding
 2. Thick and yellow
 3. Clear, watery plasma
 4. Beige to brown and foul-smelling
6. Before changing a dressing, you should
 1. Read the medical orders and follow them exactly
 2. Gather together all the supplies that might be required for the dressing change and remove the dressing from the wound
 3. Discuss the plan to change the dressing with the patient, assess the need for analgesia, and provide it, if necessary
 4. Tell the family to leave the room because dressings can be difficult for non-health care providers to see
7. Interventions to manage a patient who is experiencing fecal and urinary incontinence include
 1. Keeping the buttocks exposed to air at all times
 2. Use of large absorbent diapers that are changed when saturated
 3. Utilization of an incontinence cleanser, followed by application of a moisture barrier ointment
 4. Frequent cleansing, application of an ointment, and coverage of the areas with a thick, absorbent towel
8. The best description of a hydrocolloid dressing is
 1. A seaweed derivative that is highly absorptive
 2. Premoistened gauze placed over a granulating wound
 3. A debriding enzyme that is used to remove necrotic tissue
 4. A dressing that forms a gel that interacts with the wound surface
9. A binder placed around a surgical patient with a new abdominal wound is indicated for
 1. Collection of wound drainage
 2. Reduction of abdominal swelling
 3. Reduction of stress on the abdominal incision
 4. Stimulation of peristalsis (return of bowel function) by direct pressure
10. Patients with pressure ulcers require
 1. Repositioning every four to six hours
 2. Bed rest and a quiet environment
 3. Frequent dressing changes
 4. Nutritional assessment from a dietitian

✦ RECOMMENDED WEB SITES

Canadian Association for Enterostomal Therapy (CAET): <http://www.caet.ca>

CAET is an association of health care providers (ET nurses) promoting education, research, and standards for enterostomal nursing practice. Nurses with the ET designation have obtained additional post-baccalaureate level certification to offer care to patients with the following conditions: abdominal stomata (openings), fistulae, draining wounds, and selected disorders of the integumentary (skin), gastrointestinal, and genitourinary systems.

Canadian Association of Wound Care (CAWC): <http://cawc.net>

The CAWC is an interprofessional national organization dedicated to prevention, treatment, evaluation, and scholarship regarding wound care across the continuum of care. The CAWC Web site has quick reference guides and best practice articles available for downloading on all aspects of wound care practice, as well as information on upcoming seminars, conferences, and scholarship funding opportunities.

European Pressure Ulcer Advisory Panel: <http://www.epuap.org>

Created in 1996, this group of health care providers and wound care experts works to lead and support all European countries in the efforts to prevent and treat pressure ulcers. The mission statement is "to provide the relief of persons suffering from or at risk of pressure ulcers, in particular through research and the education of the public." Numerous links to European wound care organizations appear on the Web site.

National Pressure Ulcer Advisory Panel (NPUAP): <http://www.npuap.org>

The NPUAP provides multidisciplinary leadership for improved patient outcomes in pressure ulcer prevention and management through education, public policy, and research.

Registered Nurses' Association of Ontario (RNAO) Best Practice Guidelines: <http://www.rnao.org/bestpractices>

This Web site provides links to the RNAO Best Practice Guidelines, including Risk Assessment and Prevention of Pressure Ulcers and Assessment and Management of Stage I to IV Pressure Ulcers, which can be downloaded as a pdf file or purchased through RNAO.

Wound, Ostomy, and Continence Nurses (WOCN) Society: <http://www.wocn.org>

The WOCN Society is a professional nursing society that supports the practice and delivery of expert health care to patients with wounds, ostomies, and incontinence.

World Wide Wounds: <http://www.worldwidewounds.com>

World Wide Wounds is an online, peer-reviewed journal with a focus on current research and evidence-informed practice issues.

Wound Care Management: <http://www.lhsc.on.ca/wound>

This Web site is a clinical resource, based on evidence-informed best practices for wound care. The site includes numerous links to online resources, and typical wounds and dressing options.

Review Question Answers

1. 4, 2, 1, 3, 4, 4, 3, 5, 3, 6, 3, 7, 3, 8, 4, 9, 3, 10, 4

Rationales for the Review Questions appear at the end of the book.

Sensory Alterations

Original chapter by Jill Parsons, RN, MSN, PCCN

Canadian content written by Pamela G. Hawranik, RN, MN, PhD

objectives

Mastery of content in this chapter will enable you to:

- Define the key terms listed.
- Differentiate among the processes of reception, perception, and reaction to sensory stimuli.
- Discuss the relationship of sensory function to an individual's level of wellness.
- Discuss common causes and effects of sensory alterations.
- Discuss common sensory changes that occur with aging.
- Identify factors important in the assessment of a patient's sensory status.
- Identify nursing diagnoses relevant to patients with sensory alterations.
- Develop a plan of care for patients with sensory deficits.
- List interventions for preventing sensory deprivation and controlling sensory overload.
- Describe conditions in the health care agency or patient's home that you can adjust to promote meaningful sensory stimulation.
- Discuss ways to maintain a safe environment for patients with sensory deficits.

key terms

- | | |
|--|-------------------------------------|
| Audiologist, p. 1305 | Presbycusis, p. 1304 |
| Auditory, p. 1301 | Presbyopia, p. 1304 |
| Cataract, p. 1304 | Proprioceptive, p. 1306 |
| Cerumen, p. 1302 | Refractive error, p. 1313 |
| Central auditory processing disorders, p. 1304 | Retinal detachment, p. 1304 |
| Conductive hearing loss, p. 1304 | Sensorineural hearing loss, p. 1304 |
| Diabetic retinopathy, p. 1304 | Sensory deficit, p. 1303 |
| Glaucoma, p. 1304 | Sensory deprivation, p. 1303 |
| Gustatory, p. 1301 | Sensory overload, p. 1305 |
| Hyperesthesia, p. 1318 | Stereognosis, p. 1301 |
| Kinesthetic, p. 1301 | Strabismus, p. 1313 |
| Macular degeneration, p. 1304 | Tactile, p. 1301 |
| Myopia, p. 1304 | Tinnitus, p. 1304 |
| Olfactory, p. 1301 | Tympanic membrane, p. 1302 |
| Otitis media, p. 1304 | Vertigo, p. 1304 |
| Otolaryngologist, p. 1305 | Visual, p. 1301 |
| Ototoxic, p. 1310 | Xerostomia, p. 1304 |

media resources

evolve WEBSITE

<http://evolve.elsevier.com/Canada/Potter/fundamentals/>

- Animations
- Audio Chapter Summaries
- Examination Review Questions
- Glossary
- Student Learning Activities
- Weblinks

People rely on a variety of sensory stimuli to give meaning and order to events occurring in their environment. The senses help form the perceptual base of our world (Touhy et al., 2012). Stimulation comes from many sources inside and outside the body, particularly through the senses of sight (**visual**), hearing (**auditory**), touch (**tactile**), smell (**olfactory**), and taste (**gustatory**). The body also has a **kinesthetic** sense that enables a person to be aware of the position and movement of body parts without seeing them. **Stereognosis** is a sense that allows a person to recognize an object's size, shape, and texture. Meaningful stimuli allow a person to learn about the environment and are necessary for healthy functioning and normal development.

The chapter author gratefully acknowledges Heather Cathro, RN, MN, for her assistance.

When sensory function is altered, the person's ability to relate to and function within his or her environment changes drastically. Sensory alterations can affect the individual's ability to manage care for themselves in their homes, decrease independence, and affect their ability to learn and adopt necessary self-care practices (Speros, 2009). Visual and hearing loss may affect communication, cognition, and mobility. Olfactory, tactile, and gustatory impairments may result in nutritional problems with resultant weight loss, dehydration, and skin breakdown. Many patients seeking health care have preexisting sensory alterations (e.g., cataracts). Others may develop sensory alterations as a result of medical treatment (e.g., hearing loss from antibiotic use). The health care environment itself can cause sensory alterations. For example, a hospital unit is often a place of unfamiliar sights, sounds, and smells, as well as a place that minimizes contact with family and friends. As a nurse, you must understand and help meet the needs of patients with sensory alterations, as well as recognize patients most at risk for developing sensory problems.

Scientific Knowledge Base

Normal Sensation

The nervous system continuously receives thousands of bits of information from sensory nerve receptors, relays the information through appropriate channels, and integrates the information into a meaningful response. Sensory stimuli reach the sensory receptors and can elicit an immediate reaction or present information to the brain to be stored for future use. The nervous system must be intact for sensory stimuli to reach appropriate brain centres and for the individual to perceive the sensation. After interpreting the significance of a sensation, the person can then react to the stimulus (Table 47-1).

Reception, perception, and reaction are the three components of any sensory experience. Reception begins with stimulation of a nerve cell called a receptor, which is usually designed for only one type of stimulus, such as light, touch, or sound. In the case of special senses, the receptors are grouped close together or located in specialized organs (McCance & Huether,

► TABLE 47-1 Normal Hearing and Vision

Function

The Ear

Transmits to the brain an accurate pattern of all sounds received from the environment, the relative intensity of these sounds, and the direction from which they originate.

External Ear

The purpose of the hair follicles and the cerumen is to protect against the entry of foreign matter into the canal and lubricate the canal to inhibit growth of bacteria and fungi. The external auditory canal shelters the tympanic membrane and maintains the elasticity of the tympanic membrane by maintaining a relatively constant temperature and humidity.

Middle Ear

The function of the middle ear is to transmit sound from the external auditory canal to the inner ear. The functions of the tympanic membrane are to cause the ossicles to vibrate in order to transmit sound waves to the inner ear and to protect the middle ear.

Inner Ear

When vibrations at the oval window are transmitted to the inner ear they distort and move the fluid and hair cells in the labyrinth. The inner ear converts sound waves for the transmission and interpretation by the brain regarding body position, sound, and movement. The impulses are then transmitted along the eighth cranial nerve to the brain.

The Eye

Transmits to the brain an accurate pattern of light reflected from solid objects in the environment and transformed into colour and hue.

Anatomy and Physiology

The auditory system is composed of three major parts: external ear, middle ear, and inner ear.

The external ear is composed of the auricle (or pinnae) and the external auditory canal. The pinnae direct and funnel sound waves into the external auditory canal and then to the eardrum (**tympanic membrane**). The outer one-third of the canal is lined with hair follicles and glands that secrete **cerumen** or ear wax.

The middle ear consists of the tympanic membrane, the ossicles, and the oval window. The tympanic membrane is located at an oblique angle at the end of the auditory canal.

The ossicles are three small bones (malleus, incus, and stapes). They are often nicknamed hammer, anvil, and stirrup, respectively.

Movement of the stapes in the oval window creates vibrations in the fluid of the inner ear.

The inner ear contains three interconnected bony structures: cochlea, vestibule, and semicircular canals. They are often called the labyrinth because of their winding canal system. They contain fluid and tiny hair cells.

The external parts of the eye include the eyebrows, eyelids, eyelashes, conjunctiva, cornea, sclera, and tear ducts. The internal structures include the sclera, cornea, choroid, ciliary body, iris, pupil, lens, and retina.

Light rays enter the convex cornea and begin to converge. Fine adjustment of light rays occurs as they pass through the pupil and through the lens. The ciliary muscles change the shape of the lens to focus the light on the retina.

The retina has a pigmented layer of cells to enhance visual acuity. The sensory retina contains the rods and cones—photoreceptor cells sensitive to stimulation from light.

Photoreceptor cells send electrical impulses by way of the optic nerve to the brain.

2006), such as the taste buds of the tongue or the retina of the eye. When a nerve impulse is created, it travels along pathways to the spinal cord or directly to the brain. For example, sound waves stimulate hair cell receptors within the organ of Corti (located in the inner ear), which causes impulses to travel along the eighth cranial nerve to the acoustic area of the temporal lobe. Sensory nerve pathways usually cross over to send stimuli to opposite sides of the brain. The actual perception or awareness of unique sensations depends on the receiving region of the cerebral cortex, where specialized brain cells interpret the quality and nature of sensory stimuli. When the person becomes conscious of the stimuli and receives the information, perception takes place. Perception includes integration and interpretation of the stimuli on the basis of the person's experiences. A person's level of consciousness influences how well stimuli are perceived and interpreted. Any factors lowering consciousness impair sensory perception. If sensation is incomplete, such as blurred vision, or if past experience is inadequate for understanding stimuli such as pain, the person may react inappropriately to the sensory stimulus.

It is impossible to react to all of the multiple stimuli entering the nervous system. The brain prevents sensory bombardment by discarding or storing sensory information. A person will usually react to stimuli that are the most meaningful or significant at the time. After continued reception of the same stimulus, however, a person stops responding, and the sensory experience goes unnoticed. For example, a person concentrating on reading a good book may not be aware of music in the background.

The balance between sensory stimuli entering the brain and those actually reaching a person's conscious awareness maintains a person's well-being. If an individual attempts to react to every stimulus within the environment, or if the variety and quality of stimuli are insufficient, sensory alterations occur.

Sensory Alterations

The most common types of sensory alterations are sensory deficits, sensory deprivation, and sensory overload. When a patient has more than one sensory alteration, the ability to function and relate effectively within the environment can be seriously impaired.

Sensory Deficits. A loss in the normal function of sensory reception and perception is a **sensory deficit**. The prevalence of sensory deficits is of concern, particularly with the increase in the number of people reaching 65 years and over. As of 2009, 817,000 Canadians had vision loss, with an additional 3.43 million Canadians having diabetic retinopathy, age-related macular degeneration (AMD), cataract, and glaucoma. Vision loss increases in incidence as a person ages. After the age of 40 years, the number of cases of vision loss doubles every decade and triples after 75 years of age (Muzychka, 2009). Vision loss can have different causes at various ages. In Canada, the leading causes of vision loss in children are amblyopia (lazy eye), retinopathy of prematurity (ROP), and congenital causes of diseases such as cataract and glaucoma (Buhmann et al., 2007; in Muzychka, 2009, p. 27). In adults, AMD, glaucoma, diabetic retinopathy, and cataract are the most frequent causes of vision loss (Muzychka, 2009).

Of Canadians 15 years and older, 5.0% reported having a hearing limitation in 2006 (Statistics Canada, 2009). Eight out of ten (83.2%) of these individuals reported having mild hearing limitations, while 16.9% indicated their hearing limitation was severe. Beginning at 35 to 44 years of age, the

prevalence of hearing limitation was at 1.5%. With age, the prevalence increases to 25.9% in individuals aged 75 years and older (Statistics Canada, 2009).

When senses are impaired, the sense of self is affected. Initially, a person may withdraw by avoiding communication or socialization with others in an attempt to cope with the sensory loss. It becomes difficult for the person to interact safely with the environment until new skills are learned. When a deficit develops gradually or when considerable time has passed since the onset of an acute sensory loss, the person may learn to rely on unaffected senses. When one sense is impaired, people depend on their other intact senses. However, individuals with dual sensory impairments, for example, vision and hearing loss, have increased difficulty compensating (Perlmutter et al., 2010).

Patients with sensory deficits may change behaviour in effective or ineffective ways. For example, one patient with a hearing impairment may turn the unaffected ear toward the speaker to hear better, whereas another patient may shun people to avoid the embarrassment of not being able to understand their speech.

Many conditions and diseases cause sensory deficits (Box 47-1). Certain sensory deficits have been found to occur in higher rates with certain genders and race. White people have somewhat higher rates of overall vision loss in Canada compared to visible minorities. Men from visible minority populations have high rates of glaucoma. Aboriginal Canadians have higher rates of diabetic retinopathy. Chinese-Canadians have twice the rate of AMD and diabetic retinopathy compared to Caucasians. Vision loss affects women slightly more than men; however, this may reflect the greater longevity of women (Access Economics, 2009). More research needs to be conducted to identify whether gender and race are the causative factors, or whether other factors such as lifestyle, poverty, inadequate nutrition, genetics, or environment are the causative or associative factors.

Sensory Deprivation. The reticular activating system in the brain stem mediates all sensory stimuli to the cerebral cortex. Even in deep sleep, individuals are able to receive stimuli. Sensory stimulation must be of sufficient quality and quantity to maintain a person's awareness. When a person experiences an inadequate quality or quantity of stimulation, **sensory deprivation** occurs. Three types of sensory deprivation are reduced sensory input (e.g., caused by sensory deficit from visual or hearing loss), elimination of pattern or meaning from input (e.g., exposure to strange environments), and restriction of the environment (e.g., bed rest or reduced environmental variation) that produces monotony and boredom (Touhy et al., 2012).

A decrease in stimuli can occur when patients are placed in isolation. This can reduce the number of people entering their room and contact with the outside world. As well, nurses are required to follow transmission-based precautions, which include the use of masks and gloves. Masks may prevent visualization of caregivers' faces, and gloves will alter the sense of touch. The highly technical nature of health care makes human touch even more important. Patients may feel isolated and anxious when surrounded by equipment and hooked up to machines (Leder & Krukoff, 2008).

Sensory deprivation has many effects (Box 47-2). The symptoms can easily cause nurses and physicians to believe that a patient is psychologically ill and confused, is suffering from severe electrolyte imbalance, or is under the influence of

► BOX 47-1 Common Diseases and Conditions That Cause Sensory Deficits

Visual Deficits

Presbyopia: A gradual decline in the ability of the lens to accommodate or to focus on close objects. Individual is unable to see near objects clearly. Generally associated with aging.

Myopia: A refractive error that is inherited or due to disease or trauma. Most often called nearsightedness.

Cataract: Cloudy or opaque areas in part of or in the entire lens that interfere with passage of light through the lens. Cataracts usually develop gradually and without pain, resulting in blurring, decreased vision, and glare. Although associated with aging, cataracts can also be caused by diabetes, injury, or medications, especially steroids.

Dry eyes: Common in older adults and results in a gritty feeling, pain, itching, blurred vision, light sensitivity, redness and sometimes excessive tears as a compensatory response.

Glaucoma: A condition of increased fluid pressure inside the eye that can eventually damage the optic nerve. Left untreated, can result in visual field loss, decreased visual acuity, a halo effect seen around objects, and blindness. Can be idiopathic in origin or may be caused by eye injury, inflammation, tumours, diabetes, or medications such as steroids. One of the most common causes of blindness. It can develop at any age, but it affects one in 100 Canadians over 40 years of age (Muzychka, 2009).

Diabetic retinopathy: Long-term or poorly managed diabetes can lead to progressive damage to the blood vessels that feed the retina. These blood vessels leak into the retina, resulting in severe vision loss or blindness.

Macular degeneration (also referred to as *age-related macular degeneration [AMD]*): Condition in which the macula (located in the centre of the retina) results in a gradual or sudden loss of central vision. First signs may include blurring of reading matter, distortion or loss of central vision, and distortion of vertical lines.

Retinal detachment: Occurs when the retina develops small holes or tears. May occur with thinning of the retina with aging or from separation of the vitreous from the retina and is more common in those with a family history of retinal detachment. Nearsightedness, infection, or injury, such as trauma to the eye, are other causes (Canadian Ophthalmological Society, 2007).

Hearing Deficits

Conductive hearing loss: Sound waves are not effectively transmitted through the outer and middle ear to the inner ear.

Common causes are partial or total blockage of the ear canal, as from colds, allergies, and ear infections.

Presbycusis: A common progressive hearing disorder in older adults that results in the inability to hear high-pitched sounds, making speech seem more muffled and unclear (Public Health Agency of Canada, 2006).

Central auditory processing disorders: Involve damage to the auditory centres and pathways in the central cortex. Some causes include traumatic brain injury, tumours, or heredity.

Cerumen accumulation: Buildup of cerumen (earwax) in the external auditory canal. Cerumen becomes hard, collects in the canal, and causes conduction deafness. More common in older people.

Otosclerosis: A hereditary condition, resulting in hardening of the ossicles in the middle ear and gradual and progressive hearing loss that is usually accompanied by **tinnitus** (background noises in the ear, hissing or ringing sounds, or discrete tones or pulses).

Menière's disease: A disorder of the inner ear characterized by hearing loss, tinnitus, and **vertigo** (sudden loss of balance). It likely is caused by increased fluid in the inner ear. This disorder usually begins in people between the ages of 20 and 50 years.

Otitis media: Infection of the middle ear; common in infants and children. Recurrent or chronic otitis media can cause damage to the eardrum or middle ear, resulting in permanent hearing loss.

Sensorineural hearing loss: Exposure of ears to excessive noise levels, certain medications, or viruses, that can lead to damage of the hair cells in the cochlea or of the nerve cells between the inner ear and central auditory cortex.

Balance Deficit

Benign positional vertigo: Common condition in older adulthood, usually resulting from vestibular dysfunction. Frequently, episodes of vertigo or disequilibrium are precipitated by a change in the position of the head.

Taste Deficits

Xerostomia: Decrease in salivary production that leads to thicker mucus and dry mouth. It may result from the adverse effects of medications such as antihistamines. Can interfere with the ability to eat and leads to appetite and nutritional problems.

Taste alterations: Alterations, manifested by food aversions and decreased caloric intake; can occur frequently in patients with cancer and as people age.

► BOX 47-2 Effects of Sensory Deprivation

Cognitive Effects

Reduced capacity to learn
Inability to think or to problem solve
Poor task performance
Disorientation
Bizarre thinking
Increased need for socialization, altered mechanisms of attention

Affective Effects

Boredom
Restlessness
Increased anxiety

Emotional lability (i.e., rapid mood swings)

Panic

Increased need for physical stimulation

Perceptual Effects

Alterations in
Visual-motor coordination
Colour perception
Apparent movement
Tactile accuracy
Ability to perceive size and shape
Spatial and time judgement

Source: Adapted from Ebersole, P., Touhy, T., Hess, P., & Jett, K. (2007). *Toward healthy aging: Human needs and nursing response* (7th ed.). St Louis, MO: Mosby Elsevier.

psychotropic drugs. Therefore, you must always be aware of the patient's existing sensory function and the quality of stimuli within the environment. As a nurse, you can help prevent sensory deprivation by ensuring your patients have the necessary visual or hearing aids they require (Aguirre, 2010).

Sensory Overload. When a person receives multiple sensory stimuli and cannot perceptually disregard or selectively ignore some stimuli, **sensory overload** occurs. Excessive sensory stimulation prevents the brain from appropriately responding to or ignoring certain stimuli. It may lead to delirium, a serious condition experienced by many patients who have sensory alterations. Because of the multitude of stimuli leading to overload, the person no longer perceives his or her environment in a way that makes sense. Overload prevents meaningful response by the brain; the person's thoughts race, attention moves in many directions, and anxiety and restlessness may occur. As a result, overload causes a state similar to that produced by sensory deprivation. However, in contrast to deprivation, overload is individualized. A person's tolerance to sensory overload may vary by level of fatigue, attitude, and emotional and physical well-being.

The acutely ill patient may easily be affected by sensory overload. The patient in constant pain or who undergoes frequent monitoring of vital signs or lack of sleep is at risk. Multiple stimuli can combine to cause overload even if you offer a comforting word or provide a gentle back rub. Patients may not benefit from nursing interventions because their attention and energy are focused on more stressful stimuli. Another example is the patient who is hospitalized. Lights are always on. Sounds can be heard from monitoring equipment, staff conversations, equipment alarms, and the activities of people entering the unit.

The behavioural changes associated with sensory overload can easily be confused with mood swings or simple disorientation. You must look for symptoms such as racing thoughts, scattered attention, restlessness, and anxiety. Constant reorientation, control of excessive stimuli, and, if possible, providing care in blocks of time become an important part of the patient's care. Providing clocks and calendars, dimming lights, family support, and clear communication can help to prevent sensory overload and delirium (Robinson et al., 2008).

Nursing Knowledge Base

Factors Affecting Sensory Function

Many factors affect sensory function, including the patient's age, the quantity and quality of stimuli, social interaction, and family and environmental factors. As the nurse delivering care, you must be aware of and address as many of these factors as possible.

Age. Infants are unable to discriminate sensory stimuli because nerve pathways are immature. Visual changes during adulthood include presbyopia, which leads to the need for reading glasses. These changes usually occur from ages 40 to 50 years. Visual difficulties normally associated with aging include reduced visual fields, increased glare sensitivity, impaired night vision, reduced accommodation and depth perception, and reduced colour discrimination (Speros, 2009) (Box 47-3). Colours with short wavelengths, such as blues, pinks, beiges, and greens, become more difficult to distinguish, while colours with long wavelengths, such as reds, oranges, and yellows, are easier to discriminate. The visual changes can occur gradually, and in many cases the older adult may not

> BOX 47-3

Aging Changes to Vision That Affect Visual Ability

- Decrease in peripheral vision
- Shrinkage in the size of the pupils
- Ciliary muscles that change the shape of the lens become less flexible
- Cornea becomes more opaque and yellowed
- Decrease in tear production
- Clouding of the lens

> BOX 47-4

Aging Changes to Hearing That Affect Hearing Ability

- Increased rigidity of the ossicles
- Decreased elasticity of the tympanic membrane
- Increased cerumen production
- Decrease in number of neurons and blood vessels
- Loss of hair cells in inner ear

notice their vision deteriorating until a triggering event occurs, such as a fall.

Hearing changes include decreased hearing acuity, speech intelligibility, pitch discrimination, and hearing threshold (Box 47-4). Older adults hear low-pitched sounds best but have difficulty hearing conversation over background noise. Speech sounds are garbled, and reception of and reaction to speech are delayed. Older adults have difficulty discriminating particular consonants (*z, t, f, g*) and high-frequency sounds (e.g., *s, sh, ph, k*) (presbycusis). A problem with age-related hearing loss is that some individuals may not even be aware of their deficit, or that what are thought of as age-related changes are, in fact, abnormal changes. A serious concern for those with a hearing deficit is that they may be inappropriately labelled as confused.

Noise exposure over time and loss of blood supply to the cochlea affect hearing loss as people age. Adult sensorineural hearing loss can be caused by metabolic, vascular, and other systemic alterations. Metabolic changes, however, appear to be the most significant factor affecting age-related hearing loss (Sprinzel & Riechelman, 2010). Hearing loss may also be a side effect of medications, such as thiazide diuretics. A patient may benefit from a referral to an **audiologist** or **otolaryngologist** if the assessment reveals a serious hearing problem.

Harmful noise levels occur in the workplace and in recreational environments. Poor noise control, inadequate hearing protection, and lack of education about the risks of hearing loss are contributing factors. Military personnel, lawn care workers, and people who work around power tools and loud music are at risk for occupation-related hearing loss (Fausti et al., 2005).

Olfactory changes include a reduction in olfactory nerve fibres by the age of 50 years. Reduced taste discrimination and reduced sensitivity to odours are common. By age 65, more than half of people report a change in sense of smell, resulting in decreased enjoyment of eating and drinking, as well as posing a safety risk for detecting harmful odours in the environment. Diminished sense of smell results from a reduction in the number of olfactory sensory neurons and bulb cells.

Disorders such as Parkinson's, Alzheimer's, and trauma can also cause a diminished sense of smell (Griggs, 2008).

Diminished taste with aging likely results from a reduction in the function or number of taste buds along with decreased saliva production. Smoking, poor oral hygiene, nasal polyps, and radiation therapy may also contribute to diminished taste sensation (Capezuti et al., 2008). Medications and their adverse effects can contribute to gustatory changes. Some of the common medications that can cause gustatory changes are lipid-lowering drugs, antihistamines, antibiotics, bronchodilators, and antidepressants (Griggs, 2008).

Proprioceptive changes after the age of 60 years include increased difficulty with balance, spatial orientation, and coordination. Proprioceptive dysfunction can be caused by vestibular dysfunction and neuropathy, or any factor that affects the reception, transmission, perception, or interpretation of proprioceptive stimuli (McCance & Huether, 2006). Older adults experience tactile changes, including declining sensitivity to pain, pressure, and temperature. Factors affecting tactile changes are numerous and include trauma, infection, metabolic or vascular changes, degenerative diseases, and sedative drugs (McCance & Huether, 2006).

It is very important to note, you must be careful not to assume automatically that a patient's sensory problem is related to advancing age. You must conduct a careful assessment to determine the true cause(s).

Quality of Stimuli. Meaningful stimuli reduce the incidence of sensory deprivation. In a patient's home or a long-term care facility, meaningful stimuli may include such things as pets, music, television, family photographs, a calendar, and a clock. The presence of others can offer positive stimulation. The presence or absence of meaningful stimuli influences alertness and the ability to participate in care.

Quantity of Stimuli. The quantity of stimuli, whether excessive or minimal, can have detrimental effects on the patient. Excessive stimuli in an environment can cause sensory overload. The frequency of observations and procedures performed in an acute care setting may be stressful. If the patient is in pain, has many tubes and dressings, overstimulation can be a problem. As well, the sounds of electrical monitors and equipment, repetitive or loud noises, such as an elevator or the nurses' station nearby, bright lighting, and the odour of body fluids are other examples of stimuli that can contribute to overload.

Social Interaction. Patients with hearing loss tend to decrease the time spent with social activities and verbal communication. Family members may notice a reluctance to use the telephone and that questions are being answered inappropriately. Children with hearing deficits may be inattentive, uncooperative, or easily bored. Often a patient is too embarrassed to continually ask another person to repeat what has been said; instead, the person avoids communication. Patients who find their lifestyles influenced by hearing or vision loss can become at risk for lowered self-esteem, depression, and social withdrawal (Pelletier et al., 2009).

Family Factors. The amount and quality of contact with supportive family members and significant others can influence the degree of isolation the patient feels. The absence of visitors during hospitalization or residency in a long-term care facility can also affect sensory status. This is a common problem in hospital settings, where visitation is restricted. The ability to discuss fears or concerns with loved ones is an important coping mechanism for most people. Therefore, the absence of

meaningful conversation can cause a person to become sensorially deprived, and you may not be alerted to this problem until behavioural changes occur.

Environmental Factors. A person's work environment can increase the risk for sensory alterations. Individuals who are exposed to loud noises at work or who have occupations involving the risk of exposure to chemicals or flying objects should be screened for hearing and visual problems. Patients who use their hands in a repetitive fashion (e.g., computer programmers) are at risk for carpal tunnel syndrome, a condition characterized by swelling or inflammation of the wrists. This inflammation creates pressure on the nerve as it passes through the narrow area in the wrist. The patient can experience numbness, tingling, pain, and weakness in the hand while performing fine hand movements.

A hospitalized patient can be at risk for sensory alterations from exposure to environmental stimuli or a change in sensory input. Patients who are immobilized because of bed rest, disability, or physical encumbrances (e.g., casts or traction) are at risk because they are unable to move freely and to seek out meaningful interactions. Patients placed in isolation because they have a communicable disease are also at risk (see Chapter 32) because of a lack of interaction with visitors.

As a result of illness or hospitalization, a patient is often confined to an unfamiliar environment. This does not mean that all hospitalized patients have sensory alterations. However, you must carefully assess patients who are subjected to continued sensory stimulation. The patient's environment, within both the health care setting and the home, is carefully assessed, looking for factors that pose risks or that need adjustment to provide safety and more stimulation.

Critical Thinking

Critical thinking involves synthesizing knowledge and information gathered from patients, experience, and intellectual and professional standards. During assessment (Figure 47-1), you consider all critical thinking elements that help you make appropriate nursing diagnoses. Rowles and Russo (2009) discuss how nurses need critical thinking skills to provide individualized, evidence-informed care to meet patients' complex needs. Critical thinking requires interpreting and synthesizing information to make decisions in planning and delivering nursing care.

In caring for patients with sensory alterations, you must integrate knowledge from several areas: normal anatomy and physiology of the sensory and nervous systems, the pathophysiology of sensory deficits and factors that affect sensory function, therapeutic communication principles, and normal aging changes. This information enables you to conduct appropriate assessments, anticipate what to recognize when a patient describes a sensory problem, and recognize abnormalities. For example, knowing that someone with glaucoma will have tunnel vision (i.e., they can see clearly at the centre of their visual field but cannot see the periphery), will help you recognize that when they are sitting down for a meal, they may not see the location of their cup or other dining utensils that would be outside the centre of their vision.

Previous experience in caring for patients with sensory deficits enables you to recognize limitations in function in each new patient and how those limitations might affect the patient's ability to carry out daily activities. For example, after caring for a patient with a hearing impairment, you will

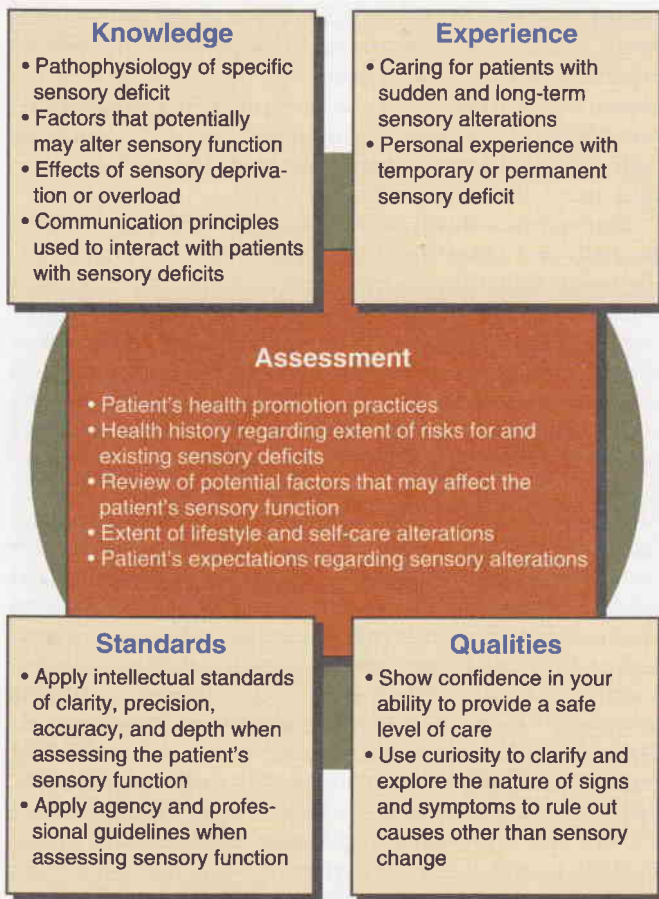


Figure 47-1 Critical thinking model for sensory alterations assessment.

be able to conduct a more effective assessment of the next patient.

Critical thinking qualities and standards, when applied during assessment, ensure a thorough and accurate database from which to make decisions.

Standards of care and practice, such as those from the Canadian Ophthalmological Society, the Registered Nurses' Association of Ontario, the Canadian Gerontological Nursing Association, and the Canadian National Institute for the Blind (CNIB) provide criteria for screening sensory problems and for establishing standards for competent, safe, and effective care and practice. Using critical thinking, you can conduct a thorough assessment and then plan, implement, and evaluate care that will enable the patient to function safely and effectively.

Nursing Process

◆ Assessment

When assessing patients with or at risk for sensory alterations, you must consider how the patient's particular illness may lead or has led to sensory changes. As well, all the factors that may influence sensory function must be considered. For example, if the patient has a hearing impairment, communication style is adjusted and assessment is focused on relevant criteria related to hearing deficits. You collect a history that also assesses the patient's current sensory status and the

degree to which a sensory deficit affects the patient's lifestyle, psychosocial adjustment, developmental status, self-care ability, and safety. The assessment must also focus on the quality and quantity of environmental stimuli.

Sensory Alterations History

The nursing health history includes assessment of the nature and characteristics of sensory alterations or any problem related to an alteration. Begin by asking the patient to describe the sensory deficit, as in the following examples:

- Describe your hearing loss. For how long have you noticed this?
- Describe how your vision is affected.
- Explain how use of your hands has changed.

Knowledge about the onset and duration of the sensory alteration can be helpful. You can learn how long the patient has taken measures to adjust to the alteration by asking questions such as the following:

- How long have you had a visual problem?
- When did you begin to feel numbness in your hands? In your legs?
- How long have you noticed being unable to hear conversations clearly?

It is also useful to assess the patient's self-rating for a sensory deficit. You can simply say, "Rate your hearing as excellent, good, fair, poor, or bad." Then, from the patient's self-rating, explore more fully the patient's perception of a sensory loss. This provides a more in-depth look at how the patient's quality of life has been influenced. There are a number of bedside assessment tools that can be used to assess hearing impairment. A screening tool developed by Ventry and Weinstein (1982) has been found to be effective in identifying patients needing audiological intervention. The screening version of the Hearing Handicap Inventory for the Elderly (HHIE-S) is a 5-minute, 10-item questionnaire designed to assess how a patient perceives the emotional and social effects of hearing loss. The greater the handicapping effect from the hearing loss, the higher the score (Stark & Hickson, 2004). The Minimum Data Set (MDS) assessment can be used at admission and on a regular basis to detect conductive, sensorineural, or mixed hearing loss (Adams-Wendling & Pimple, 2008).

Regarding vision assessment, a vision screening kit was adapted by Hawranik and Bell (2007), from the Centre of Eye Research Australia (CERA) and World Health Organization (Carnicelli, 2001), to meet North American vision assessment conversions. The vision screening kit contains a referral algorithm and vision test results, vision history forms, a pinhole mask, and vision cards for distance and near vision testing (Figure 47-2). The referral algorithm provides direction for referral to an optometrist, ophthalmologist, or general practitioner or for vision screening in one year. The tool is useful for seniors with speech, cognitive, and motor impairments and those who are not fluent in English.

A health history can also reveal any recent changes in a patient's behaviour. Often friends or family are the best resources for this information because the patient may be unaware of any change. Asking the following questions may be helpful:

- Have you noticed any change in their hearing (e.g., television being turned louder)?
- Has your family member or friend shown any recent mood swings (e.g., outbursts of anger, nervousness, fear, or irritability)?

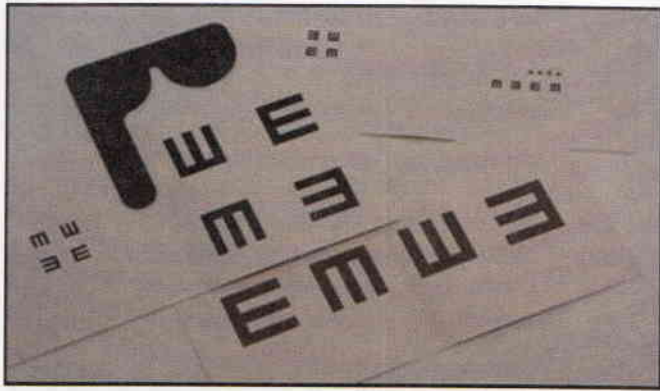


Figure 47-2 A vision screening kit. **Source:** Courtesy Sandy Bell, Winnipeg, MB.

- Have you noticed him or her avoiding social activities?
- Has your mother fallen recently?

It is important to remember that many adults are sensitive about admitting losses and may hesitate to share information.

Mental Status

Mental status assessment is an important component of any evaluation of sensory function. This is particularly important as visual impairment is a risk factor for cognitive decline (Whitson et al., 2007). Visual impairment can be associated with hallucinations, a condition referred to as Charles Bonnet syndrome (Jackson & Ferencz, 2009; Pelletier et al., 2009). Approximately 10% to 37% of people with vision loss are thought to have Charles Bonnet syndrome associated with vision loss (Jackson & Ferencz, 2009).

Observing the patient during history-taking, physical examination, and nursing care provides valuable data for evaluation of a patient's mental status. An assessment of mental status is valuable particularly if you suspect sensory deprivation or overload. Observe the patient's physical appearance and behaviour, measure the patient's cognitive ability, and assess the patient's emotional status. The Mini-Mental State Examination is an example of a tool that can be used to measure disorientation, altered conceptualization and abstract thinking, and change in problem-solving abilities (see Chapter 31). For example, a patient with severe sensory deprivation may not be able to carry on a conversation, remain attentive, or display recent or past memory.

If the patient resides in his or her own home, check for cleanliness in the home, spoiled food on the counter or in the fridge, misplaced items, inappropriate dress, and losing the way to the store or other locations he or she used to frequent.

Physical Assessment

To identify sensory deficits and their severity, assess vision, hearing, olfaction, taste, and the ability to discriminate light touch, temperature, pain, and position. Chapter 31 describes assessment techniques in detail. Table 47-2 summarizes assessment techniques for identifying sensory deficits. The data will be more accurate if the examination room is private, quiet, and comfortable for the patient.

You will also rely on personal observation of the patient to detect sensory alterations. Some useful observations indicating

hearing loss are the following: the patient seems inattentive to others, responds with inappropriate anger when spoken to, believes people are talking about him or her, has trouble following clear directions, asks to have something repeated, has monotonous voice quality and speaks unusually loudly or softly, has the television unusually loud, and answers questions inappropriately (Touhy et al., 2012).

The typical physical tests used to screen for hearing impairment rely on an examiner's whispered voice or a tuning fork. The Welch Allyn AudioScope is very effective for measuring hearing acuity. The hand-held instrument includes an ear speculum that is placed within the external ear canal. The examiner can view the tympanic membrane to ensure that cerumen is not blocking the canal. A tonal sequence is initiated by pressing a button on the audioscope. The instrument is highly sensitive to detecting hearing loss.

Ability to Perform Self-Care

Patients' functional abilities in their home environment or health care setting, including feeding, dressing, grooming, and toileting, should be assessed. For example, you can assess whether a patient with altered vision can find items on a meal tray and can read directions on a prescription. Vision loss contributes to an increase in self-administered medication errors and increased rates of hospitalization (Pelletier et al., 2009). As well, you should determine a visually impaired patient's ability to perform daily routines such as reading bills, writing cheques, or driving a vehicle at night. Does a patient's loss of balance prevent rising from a toilet seat safely? Any impairment in the ability to perform self-care has implications for planning discharge from a health care setting and for providing resources within the home. Vision loss with older people increases the risk of falls and the likelihood of being institutionalized (Pelletier et al., 2009).

Health Promotion Habits

You must assess the daily routines that patients follow to maintain sensory function. What type of eye and ear care is incorporated into daily hygiene? For those individuals who participate in sports or recreational activities or who work in a setting where ear or eye injury is a possibility (e.g., chemical exposure or constant exposure to loud noise), determine if safety glasses or hearing protective devices (HPDs) are worn. Do patients who use assistive devices such as eyeglasses, contact lenses, or hearing aids know how to care for them (see Chapter 37)? Are the devices used? Are they in proper working order?

Assess the patient's adherence to routine health screening. When was the last time the patient had an eye examination or hearing evaluation? For adults, routine screening of visual and hearing function is imperative to detect problems early. All older adults should be screened for auditory and visual deficits (Capezuti et al., 2008). This is especially true for glaucoma, which can lead to permanent visual loss if undetected. Recommended screening guidelines are usually structured according to age. Research indicates a lack of attention to vision care in long-term care settings. Hawranik and Bell (2007) surveyed 28 nursing homes in Winnipeg, Manitoba, and 45 in Aberdeen, Scotland, to determine the nature of their vision care services and data collection methodologies for falls and fractures. Only six facilities in Winnipeg and one in Aberdeen indicated they had either a policy or procedure on vision care services. Most of the health records did not indicate whether the elderly

► TABLE 47-2 Assessment of Sensory Function

Assessment	Behaviour Indicating Deficit (Children)	Behaviour Indicating Deficit (Adults)
Vision* Ask patient to read newspaper, magazine, or lettering on menu. Measure visual acuity with Snellen chart (see Chapter 31) or the Vision Screening Tool. Assess visual fields and depth perception. Assess pupil size and accommodation to light. Ask patient to identify colours on colour chart or crayons.	Self-stimulation, including eye rubbing, body rocking, sniffing or smelling, arm twirling; hitching (using legs to propel while in sitting position) instead of crawling	Poor coordination, squinting, underreaching or overreaching for objects, persistent repositioning of objects, impaired night vision, accidental falls
Hearing Perform conventional assessment, including whisper and tuning fork (see Chapter 31). Perform audiometry, if indicated. Observe patient conversing with others. Compare patient's ability to recognize consonants with ability to distinguish vowels. Assess patient's perception of hearing ability and history of tinnitus. Inspect ear canal for hardened cerumen.	Frightened when unfamiliar people approach, no reflex or purposeful response to sounds, failure to be awakened by loud noise, slow or absent development of speech, greater response to movement than to sound, avoidance of social interaction with other children	Blank looks, decreased attention span, lack of reaction to loud noises, increased volume of speech, positioning of head toward sound, smiling and nodding of head in approval when someone speaks, use of other means of communication such as lip-reading or writing, complaints of ringing in ears
Touch Assess patient for sensitivity to light touch (see Chapter 31) and temperature. Check patient's ability to discriminate between sharp and dull stimuli. Assess whether patient can distinguish objects (coin or safety pin) in the hand with eyes closed. Ask whether patient feels unusual sensations.	Inability to perform developmental tasks related to grasping objects or drawing, repeated injury from handling of harmful objects (e.g., hot stove, sharp knife)	Clumsiness, overreaction or underreaction to painful stimulus, failure to respond when touched, avoidance of touch, sensation of pins and needles, numbness
Smell Ask patient to close eyes and identify several nonirritating odours (e.g., coffee, vanilla).	Difficult to assess until child is six or seven years old, difficulty discriminating noxious odours	Failure to react to noxious or strong odour, increased body odour, decreased sensitivity to odours
Taste Ask patient to sample and distinguish different tastes (e.g., lemon, sugar, salt). Have patient drink or sip water and wait one minute between each taste. Ask patient if recent weight change has occurred.	Inability to tell whether food is salty or sweet, possible ingestion of strange-tasting things	Change in appetite, excessive use of seasoning and sugar, complaints about taste of food, weight change
Position Sense Perform conventional tests for balance and position sense (see Chapter 31).	Clumsiness, extraneous movement, excessive arm swinging in those with hyperactivity or learning difficulty Inability to sit or stand as per expected milestones	Poor balance and spatial orientation, shuffling gait, reduced response to brace self when falling, more precise and deliberate movements

*Go to <http://www.cnlb.ca/en/about/publications/vision-health/lwl/default.aspx> to see pictures of what individuals with varying visual impairments might see.

resident wore glasses or when their last eye appointment had taken place.

Hazards

A patient with sensory alterations is at risk for injury if the living environment is unsafe. For example, a patient with visual impairment cannot see potential hazards clearly. A patient with proprioceptive problems may lose balance easily

and fall. The condition of the home, the rooms, and the front and back entrances can be problematic for the patient with sensory alterations. Some of the more common hazards are the following:

- Uneven, cracked walkways leading to front or back door
- Doormats with slippery backing
- Extension and telephone cords in the main route of walking traffic

- Loose area rugs on hardwood floors or tiles; runners placed over carpeting
- Bathrooms without shower or tub grab bars
- Water faucets unmarked to designate hot and cold
- Bathroom floor with slippery surface
- Absence of smoke detectors in rooms
- Unlit stairways, lack of handrails
- Floors cluttered with material and excessive furniture, including footstools
- Kitchen equipment (e.g., ranges, irons, toasters) with hard-to-read settings

Patients living with visual impairment may also be unable to read medication labels and syringe gauges. Therefore, ask the patient to read a label to determine whether he or she can adequately see the instructions. If a patient has a hearing impairment, check to see whether the sounds of a doorbell, telephone, smoke alarm, and alarm clock are easy to discriminate.

In the hospital environment, caregivers often forget to rearrange furniture and equipment to keep paths from the bed and chair to the bathroom and entrance clear. Walking into a patient's room and looking for safety hazards must be a routine part of your care. Check frequently for the following:

- Is the call light within easy, safe reach?
- Are intravenous (IV) poles on wheels and easy to move?
- Are footstools against the bed?
- Are suction machines, IV pumps, or drainage bags positioned so that a patient can rise from a bed or chair easily?

Communication Methods

To understand the nature of a communication problem, you must know whether a patient has trouble speaking, understanding, naming, reading, or writing. Patients with existing sensory deficits often develop alternative ways of communicating. A deaf or hearing-impaired patient may read lips, use sign language, listen with the help of a hearing aid, or read and write notes. For someone who is hearing impaired, speak clearly with a moderate rate of speech and pause to determine understanding. Ensure you sit at eye level so that the patient with hearing impairment can communicate.

Horton-Ikard and Muñoz (2010) identify challenges when working with culturally and linguistically diverse individuals, such as the following: (1) health care providers with insufficient knowledge for working with people with language barriers; (2) difficulty distinguishing language differences from language disorders; and (3) lack of confidence and competence in culturally sensitive assessments and treatments. Try to include family members who can assist with translation or obtain assistance from a translator.

Visually impaired patients may be unable to observe facial expressions and other nonverbal behaviours that clarify the content of spoken communication. Instead, they rely on voice tones and inflections to detect the emotional tone of communication. Patients who have visual impairments may learn to read Braille, although decreased tactile acuity of the fingers may make this more difficult in older people. If the person has a visual impairment, speak normally from a reasonably close distance and ensure that lighting is sufficient.

Social Support

It is important for you to know the patient's social skills and level of satisfaction with the support given by family and friends. Is the patient satisfied with the support made available

BOX 47-5 RESEARCH HIGHLIGHT

An Assistive Device May Be Viewed as a Stigma of Dependency

Research Abstract

A study examining the experience of informal caregivers caring for their family member found that the older adult had a "desire for independence." The older adult would insist on maintaining his or her independence despite cognitive or physical limitations. One daughter described the following: "Under protest, she got a walker. It's sitting folded up behind her TV covered with a blanket. She also refuses to use her cane. She's very wobbly and for a long time I would grab her arm when we were walking and she would grab it away" (Hawranik & Strain, 2007, p. 164).

Reference: Hawranik, P., & Strain, L. (2007). Giving voice to informal caregivers of older adults. *Canadian Journal of Nursing Research*, 39(1), 156–172.



from friends? Is the patient able to solve problems with family members? Does the family offer the support needed when the patient requires assistance as a result of a sensory loss? The long-term effects of sensory alterations can influence family dynamics and a patient's willingness to remain active in society. People with sensory impairments, particularly visual and hearing impairments, may withdraw from social interaction and activities. Connecting seniors with sensory impairments to community resources can assist in preventing social isolation, depression, and cognitive decline (Capezuti et al., 2008).

Use of Assistive Devices

Assess for the use of assistive devices (e.g., hearing aids or glasses) and the sensory effects for the patient. This includes learning how often the devices are used daily, the patient's or family caregiver's method for cleaning, and the patient's knowledge of what to do when a problem develops. However, just because the patient has an assistive device, do not assume that it works or that the patient uses it or benefits from it (Box 47-5).

Other Factors Affecting Perception

Factors other than sensory deprivation or overload may cause impaired perception (e.g., medications or pain). Assess the patient's medication history, which includes prescribed and over-the-counter medications, as well as herbal products and caffeine. This history includes gaining information regarding the frequency, dose, method of administration, and last time these medications were taken. Some antibiotics (e.g., streptomycin, gentamicin, and tobramycin) are **ototoxic** and can permanently damage the auditory nerve; chloramphenicol can irritate the optic nerve. Opioid analgesics, sedatives, and antidepressant medications can alter the perception of stimuli. Conduct a thorough pain assessment when pain is suspected to be causing perceptual problems (see Chapter 41).

Patient Expectations

Patients depend on their senses to provide them with information so as to respond or react to a specific situation or problem. Therefore, patients may expect caregivers to recognize and

appropriately manage and adjust their environment to meet their sensory needs. This would include assisting the patient in adapting his or her lifestyle as a result of sensory impairment. You should determine from patients exactly what they expect to achieve and what interventions have been helpful in the past in the management of their limitations.

❖ Nursing Diagnosis

After assessment, you need to review all available data and look for patterns and trends suggestive of a health problem relating to sensory alterations (Box 47-6). For example, a patient's advanced age, inattentiveness during conversations, and self-rating of hearing as "poor" are all defining characteristics for the nursing diagnosis of *disturbed sensory perception (auditory)*. Validate your findings to ensure the accuracy of the diagnosis. For example, the diagnosis of disturbed thought processes could mistakenly be made if you do not confirm the patient's hearing deficit and perception of poor hearing.

As well, determine the factor that likely causes the patient's health problem. In the previous example, impacted cerumen is the cause of the patient's hearing alteration. The etiology or related factor of a nursing diagnosis is a condition that can be affected by nursing interventions. The etiology must be accurate; otherwise, nursing therapies will be ineffective. For a patient with impacted cerumen, regular irrigation of the ear canal has the potential to improve auditory perception (Armstrong, 2009). In contrast, if the patient's auditory alteration were related to hearing loss from nerve deafness, nursing interventions for alternative communication methods would be necessary.

The patient may also have health care problems for which sensory alteration is the etiology, such as with the diagnosis of risk for injury. People with vision loss have double the

incidence of falls and double the incidence of difficulties in daily living compared with those without vision loss (National Coalition for Vision Health, 2011). You may also select nursing diagnoses by recognizing the way that sensory alterations affect a patient's ability to function (e.g., self-care deficit). In addition, most patients present themselves to health care providers with multiple diagnoses (Figure 47-3). In the example of the concept map, a patient with retinal detachment has the nursing diagnosis of disturbed sensory perception, which can lead to risk for falls and fear. You must recognize patterns of data that reveal health problems created by the patient's sensory alteration. Examples of nursing diagnoses that might apply to patients with sensory alterations are the following:

- *Impaired adjustment*
- *Impaired verbal communication*
- *Risk for injury*
- *Impaired physical mobility*
- *Self-care deficit, including bathing or hygiene, dressing or grooming, or toileting*
- *Situational low self-esteem*
- *Disturbed sensory perception*
- *Social isolation*
- *Disturbed thought processes*
- *Altered socialization*

❖ Planning

During planning, use your critical thinking skills to synthesize information from multiple sources (Figure 47-4), including knowledge gained from the assessment and knowledge of how sensory deficits affect normal functioning. In this way, you can recognize the extent of the patient's deficit and know the type of interventions most likely to be helpful. Also consider the role that other health care providers can play in planning care and the available community resources (e.g., CNIB) that may be useful. Previous experience in caring for patients with sensory alterations can be invaluable when planning nursing approaches.

When applying critical thinking to planning care, professional standards can be particularly useful. These standards, in the form of clinical pathways or clinical practice guidelines, often recommend interventions based on research evidence for the patient's condition. For example, patients who have visual deficits and are hospitalized may be placed on a fall prevention protocol that will incorporate research-based precautions to ensure patient safety.

Goals and Outcomes

During planning, you will develop an individualized plan of care for each nursing diagnosis (Box 47-7). With the patient, develop a realistic plan that incorporates what you know about the patient's sensory problems and the extent to which sensory function can be maintained or improved. If maintenance or improvement is not realistic, preventing injury and learning alternative ways of maintaining independence are key. Goals and outcomes should be realistic and measurable. A goal of care for a patient with an actual or potential sensory alteration may be this: "The patient will regain improvement in hearing acuity within two weeks." Associated outcomes for this goal might be the following:

- The patient will report using communication techniques for improved reception of messages within two weeks.

► BOX 47-6 NURSING DIAGNOSTIC PROCESS

Assessment Activities	Defining Characteristics	Nursing Diagnosis
Assess patient's visual acuity.	Has reduced ability to see objects clearly. Needs brighter light to read. Has trouble distinguishing edges of stairs. May have fallen or have had a recent fracture.	<i>Risk for injury related to visual impairment from cataract formation</i>
Visit home setting and inspect for any hazards that may pose risks to patient.	Lighting in rooms, hallways, and stairwells is very dim. Carpet in living room is old, and edges are curled up. Steps lead up to front entrance of home.	
Review medical record from clinic visit.		

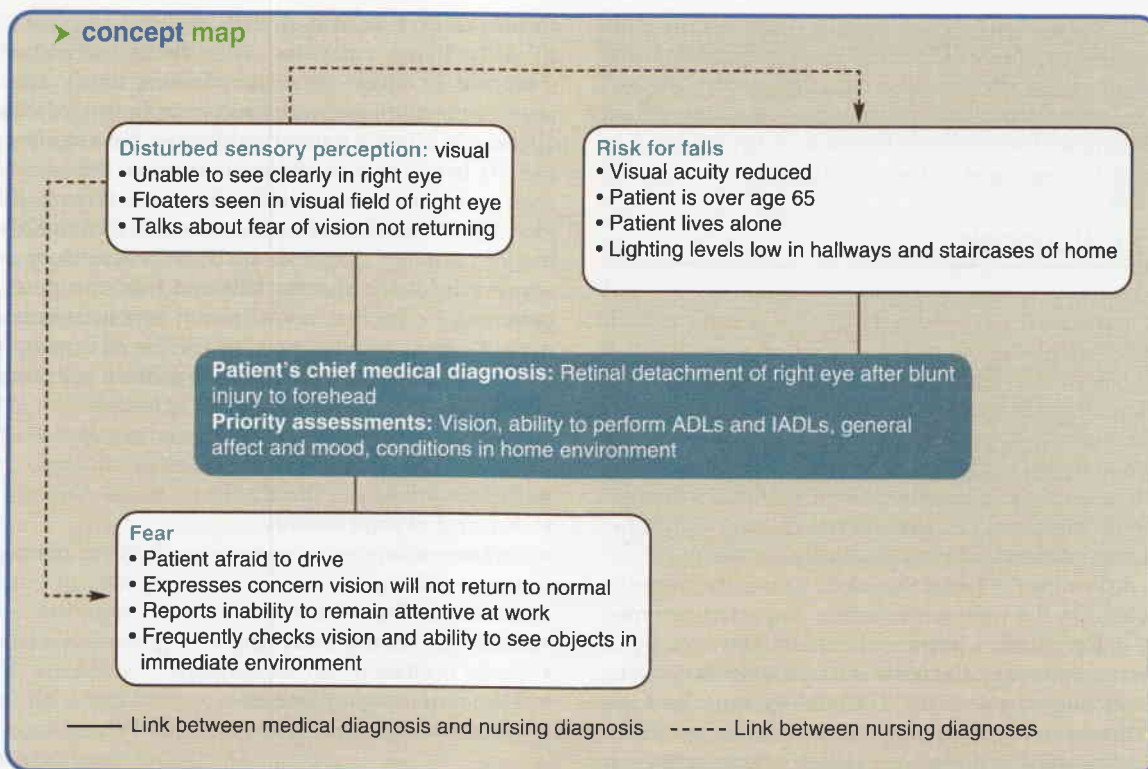


Figure 47-3 Concept map for patient with retinal detachment of right eye after blunt injury to forehead. *ADLs*, Activities of daily living; *IADLs*, instrumental activities of daily living.

- The patient will successfully demonstrate the technique for cleansing the hearing aid within one week.
- The patient and family will be observed using proper communication skills to send and receive messages.
- The patient will self-report improved hearing acuity.

Setting Priorities

Priorities of care must be set with regard to the type and extent of sensory alteration that affects a patient. For example, a patient who enters the emergency department after experiencing eye trauma may have priorities of reducing anxiety and preventing further injury to the eye. In contrast, a patient who is being discharged from an outpatient surgery department following cataract removal may have the priority of learning about any self-care requirements. However, safety is always a top priority. The patient can also help prioritize aspects of care. For example, patients may wish to learn ways to communicate more effectively or to participate in favourite hobbies, given their sensory limitation.

Some sensory alterations are short term (e.g., a patient suffering sensory or perceptual alterations as a result of sensory overload in an ICU). Appropriate interventions are thus likely to be temporary (e.g., frequent reorientation or introduction of intimate and pleasant stimuli, such as a back rub). Sensory alterations such as permanent visual loss require long-term goals of care for patients to adapt. However, patients who have sensory alterations at the time of entering a health care setting are usually most informed about how to adapt interventions to their lifestyles. People with sensory impairment need to control whatever part of their care they can. Sometimes it

becomes necessary for the patient to make major changes in self-care activities, communication, or socialization.

Collaborative Care

When developing a plan of care, consider all resources available to patients. The family can play a key role in providing meaningful stimulation and learning ways to help the patient adjust to any limitations. As part of a multidisciplinary health care team, you may also refer the patient to other health care providers. Early referrals to occupational or speech therapists, for example, can speed a patient's recovery. If a patient has experienced a major loss of sensory function and is also unable to manage medical needs, such as medication self-administration or dressing changes, referral to home care may be an option. Numerous community-based resources (e.g., CNIB, Canadian Association of Independent Living Centres, or the Canadian Hearing Society) are also available. You may be able to arrange a volunteer to visit a patient or have printed materials made available that describe ways to help cope with sensory problems.

Implementation

Nursing interventions involve the patient and family so that a safe, pleasant, and stimulating sensory environment can be maintained. The most effective interventions enable the patient with sensory alterations to function safely with existing deficits and to continue a normal lifestyle. Learning to adjust to sensory impairments can occur at any age with proper support and resources.

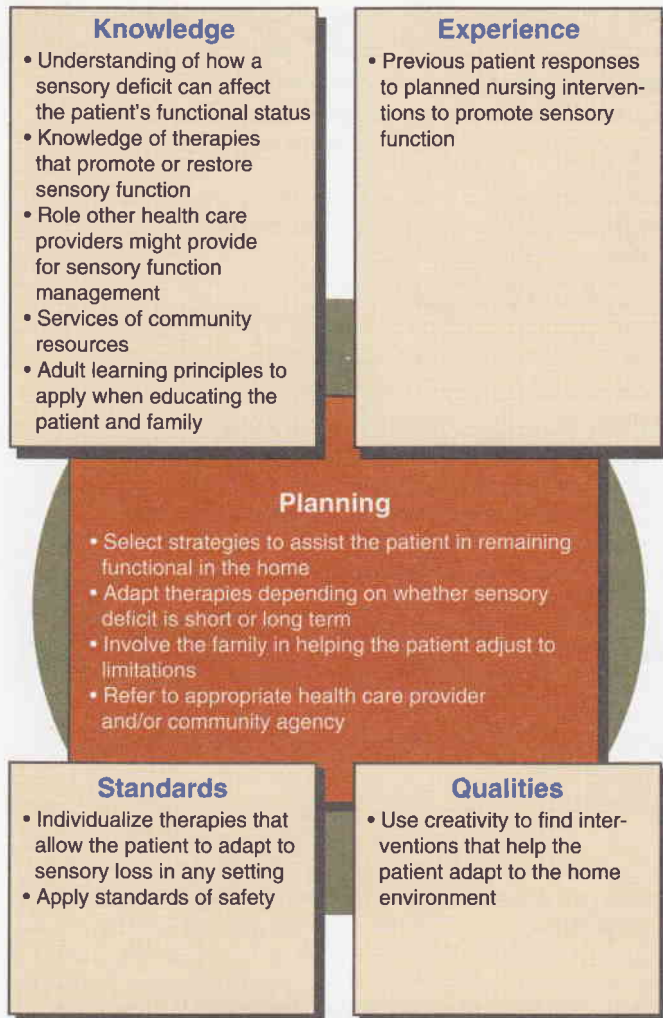


Figure 47-4 Critical thinking model for sensory alterations planning.

Health Promotion

Good sensory function begins with prevention. Almost everyone becomes exposed to risks in the environment that may cause sensory alterations. When patients enter primary health care settings, you can take the opportunity to review common-sense approaches for reducing the risk of sensory loss (Box 47-8).

Screening. The WHO (2010) estimates that 285 million people worldwide have visual impairment. More than 4 million Canadians have an age-related eye disease, such as age-related macular degeneration (AMD), glaucoma, diabetic retinopathy, or cataracts (National Coalition for Vision Health, 2011). Vision loss is among the most costly of chronic diseases in Canada. Ranking fourth in prevalence among diagnostic categories, it poses a greater burden in direct and indirect costs than respiratory diseases, diabetes, mental disorders, and many others. Measured in direct health related costs, vision loss ranks higher than any disease category in Canada (Muzychka, 2009).

Preventable blindness is a worldwide health issue. Therefore, prevention of visual impairment begins with children and requires appropriate screening (Hockenberry & Wilson, 2007). Three recommended interventions are (a) screening for rubella or syphilis in women who are considering pregnancy; (b) adequate prenatal care to prevent premature birth (with the danger of exposure of the infant to excessive oxygen); and (c) periodic screening of all children, especially newborns through preschoolers, for congenital blindness and visual impairment caused by refractive errors, amblyopia (loss of visual acuity in the nondominant eye because of lack of use in childhood), and **strabismus** (misalignment of the eyes) (Box 47-9).

Visual impairment is common during childhood. The most common visual problem is a **refractive error** such as nearsightedness. Parents must know signs suggesting visual impairment (e.g., failure to react to light and reduced eye contact from the infant) and should be instructed to report these signs to a physician immediately. Vision screening of school-aged children and adolescents can detect problems early. The school

BOX 47-7 NURSING CARE PLAN

Disturbed Sensory Perception

Assessment

Judy Long, a 70-year-old retired receptionist, tells the community health nurse that her vision has become progressively blurred over the last several years. She comments that she is having her neighbour drive her places. Judy visited an ophthalmologist, and surgery is planned.

Assessment Activities

Ask Judy to describe her vision changes.

Ask Judy to describe any life changes that have occurred since the change in vision.

Assess Judy's visual acuity.

Findings and Defining Characteristics

Judy states, "My left eye seems to have a film over it that makes my vision blurred. I am having difficulty reading. I also have difficulty with night driving; the headlights are large and blurred."

Judy indicates that she has always managed her home and done volunteering. She says she is losing her independence because she has to have someone drive her, and she is now hesitant to use stairs at home.

Judy cannot read the Snellen chart with the left eye.

Continued

► BOX 47-7 NURSING CARE PLAN—cont'd

Assessment Activities

Ask Judy the results of the visit to the ophthalmologist.

Conduct a home hazard assessment.

Findings and Defining Characteristics

Judy states that she was told she has a cataract in the left eye and a cataract beginning in her right eye; surgery is planned on her left eye.

The home is cluttered, the lighting is dim, and the stairs going into the house have no handrails.

Nursing Diagnosis: Disturbed sensory perception related to altered sensory reception of senile cataract.

Planning

Goals (Nursing Outcomes Classification)*

Judy will maintain independence in a safe home environment.

Judy will make the best use of existing visual function.

Expected Outcomes

Safety Behaviour: Home Physical Environment

Judy will verbalize changes made to protect and maintain visual acuity for indoor and outdoor activities in two weeks. A safety check of her home will show removal of safety hazards in one week.

Judy will explain plans for alternative transportation to work and social activities in one week.

Sensory Function: Vision

Judy will use visual aid devices in one week.

*Outcome classification labels from Moorhead, S., Johnson, M., Maas, M. L., & Swanson, E. (Eds.). (2008). *Nursing outcomes classification (NOC)* (4th ed.). St Louis, MO: Mosby.

Interventions (Nursing Interventions Classification)[†]

Environmental Management

Teach Judy how to improve the safety of her environment, such as making sure her home is free of clutter, footstools, and electrical cords, and to avoid rearranging furniture.

Instruct Judy to reduce glare by wearing dark-coloured sunglasses outside.

Teach Judy to use a light over the shoulder for reading and writing.

Provide magnifier for Judy to use to read newspaper and mail.

Rationale

Keeping the area clutter free reduces the risk of injury (Campbell et al., 2005).

Patients have better visual acuity when they protect their eyes from bright light (Ebersole et al., 2007).

People with cataracts see better with wider illumination (Ebersole et al., 2007).

Devices will provide magnification to improve visual acuity.

Emotional Support

Encourage Judy to express feelings regarding loss of vision and lifestyle changes.

People with vision loss experience triple the incidence of depression compared with those without vision loss (National Coalition for Vision Health, 2011).

Family Involvement

Confer with Judy on selecting a family member, friend, or community resource person who can provide transportation until after the eye condition has been corrected.

An alternative means of transportation will foster safety.

[†]Intervention classification labels are from Bulechek, G. M., Butcher, H. K., & Dochterman, J. M. (2008). *Nursing interventions classification (NIC)* (5th ed.). St Louis, MO: Mosby.

Evaluation

Nursing Actions

Ask Judy to describe the changes that have made the home environment safer.

Patient Response and Finding

Judy responds that the family has removed the clutter and handrails have been placed at the entryway. Lighting has been placed behind her chair, and 100-watt lights are in the living room.

Achievement of Outcome

Judy reports feeling safer walking the stairs and moving about in her home. The home hazards have been reduced.

► BOX 47-7 NURSING CARE PLAN—cont'd

Nursing Actions	Patient Response and Finding	Achievement of Outcome
During a home visit, observe the home environment for safety hazards.		
Observe Judy's verbal and nonverbal responses to the lifestyle adaptations.	Judy says, "I feel safer when walking in my home."	
As Judy uses a magnifier, have her read a medication label.	Judy is able to read the name of her medication and dosage correctly.	Better use is made of current vision.
Ask Judy if she is able to maintain a degree of independence with the environmental and lifestyle modifications.	Judy states, "I am more independent at home, and until surgery, I do not mind someone driving for me."	Judy has attained some degree of independence.
Ask Judy to identify source of transportation.	Judy says a family member has agreed to drive her shopping and for surgery.	Judy has transportation through the weeks required for the surgical experience.

* BOX 47-8

FOCUS ON PRIMARY HEALTH CARE

Sensory Alterations

The major goals in primary health care settings are health promotion, disease prevention, early detection, and referral. In the community, primary health care related to sensory alterations is delivered in doctors' offices, homes, community centres, schools, and industry. Public health nurses, for example, conduct newborn hearing screenings during well-baby clinics and reinforce the importance of parents following the Canadian Ophthalmological Society eye examination guidelines. In ophthalmologists' offices, the ophthalmic nurse can reinforce health promoting practices and guide the patient to find appropriate resources, such as CNIB, to assist in living with visual impairment. In long-term care facilities, the nurse can use the Vision Screening Tool at admission to provide a baseline and then annually to assess for changes in vision. In school health programs, the nurse can stress the importance of maintaining the health of eyes and ears. Occupational health nurses play a key role in preventing injury, such as ensuring that safety standards are followed.

Nurses are often consulted for guidance when changes in vision and hearing occur. Consequently, your knowledge of screening techniques is important. It is also important that you are familiar with the normal aging process, as well as the signs and symptoms of common diseases so that appropriate suggestions for referral can be made.



nurse or public health nurse is usually responsible for vision testing. Their main role is one of detection and referral.

In Canada, glaucoma is the second leading cause of blindness and affects 250,000 Canadians (CNIB and Canadian Ophthalmological Society, 2009). It is important to recommend that patients between the ages of 40 and 64 years have an eye examination every two to four years. Examinations should occur every one to two years if the patient's family has a history of glaucoma or if the patient has had a serious eye injury in the past, is taking steroid medications, or is over 65 years of age (Smith & Neely, 2007).

Children at risk for hearing impairment include those with a family history of childhood hearing impairment, perinatal

► BOX 47-9

Recommended Vision Screening Guidelines for Infants, Children, and Youth

- Newborns to three months of age should have a complete examination of the skin and external eye structures, an inspection of the red reflex to assess for lenticular opacities or posterior eye disease. Abnormal exams should warrant an urgent referral to an ophthalmologist. Any newborns at risk for retinopathy of prematurity or family histories of hereditary ocular disease should be referred to an ophthalmologist.
- From 6 to 12 months of age, the above examinations should also be done, as well as assessments of ocular alignment, corneal light reflexes, and fixation and following.
- From three to five years of age, the above examinations should be done, as well as visual acuity testing with an age-appropriate tool.
- For children and youth aged 6 to 18, routine screenings and examinations with any visual complaints are indicated (Canadian Pediatric Society, 2009).

infection (rubella, herpes, cytomegalovirus), low birth weight, chronic ear infection, and Down syndrome. You should advise pregnant women of the importance of early prenatal care, avoidance of ototoxic drugs, and testing for syphilis or rubella.

Children with chronic middle ear infections, a common cause of impaired hearing, should receive periodic auditory testing. Parents must be warned of the risks (e.g., exposure to smoke, previous history of ear infections, siblings with otitis media, attending day care) and should seek medical care when the child has symptoms of earache or respiratory infection (Kerschner et al., 2005).

Many teenagers and young adults already have permanent hearing loss caused by exposure to excessive noise from such things as iPods, MP3 players, automobile stereo systems, and concerts. According to Vogel et al. (2008), MP3 players may be the most significant risk factor for music-induced hearing loss in adolescents, and they recommend laws be in place for sound limits for manufacturers of MP3 players. This hearing impairment results in loss of sound quality: sounds are barrel-like,

and consonants are hard to hear. Quintanilla-Dieck and colleagues (2009) found most people would be receptive to wearing hearing protection when around loud music if it was recommended by a health care provider. This represents an important area for health education, particularly with adolescents and young adults.

You should routinely teach parents and children to take precautions when involved in activities associated with high-intensity noise. As well, you should assess patients for noise exposure and participate in providing hearing conservation classes for teachers, students, and patients. Some “rules of thumb” are as follows: if someone standing a metre away has to shout to be understood, or if after the noise has stopped, the person experiences a temporary hearing loss or tinnitus, then the risk for hearing loss is increased. More seriously, if someone has to shout in a person’s ear to be understood, the person is at risk for permanent hearing loss if exposed to this level of noise for just five minutes per day (Health Canada, 2006).

The guidelines for hearing screening for adults are less prescriptive. In general, if a patient works or lives in an environment where the noise level is high, routine screening is highly recommended and may be mandated by occupational health and safety measures in the workplace. Nurses in occupational settings can assess for symptoms of tinnitus and make prompt referrals. Early detection may prevent hearing disabilities. Approximately 9000 Canadians experience some form of hearing impairment due to occupational exposure each year (Health Canada, 2010). Barnett (2007) recommends that, since aging is associated with degenerative changes, patients over 40 have a routine hearing assessment. Adults must not accept hearing loss as a natural part of aging. If a hearing loss does occur, it is important to have regular hearing testing. Nurses should encourage patients to follow through with recommendations for hearing aids.

Preventive Safety. Trauma is a common cause of blindness in children. Penetrating injuries from propulsive objects such as firecrackers, slingshots, rubber bands, or rocks and penetrating wounds from sticks, scissors, or toys are just a few examples. Parents and children require education about ways to avoid eye trauma. Safety equipment can easily be found in most sports shops and large department stores. In some Canadian jurisdictions, legislation or association bylaws mandate the wearing of protective equipment (e.g., visors in minor hockey) (CNIB, n.d., a).

Adults are at risk for eye injury while playing sports and working in jobs involving exposure to chemicals or flying objects. The Canadian Centre for Occupational Health and Safety has guidelines for safety in the workplace. Employers are required to have employees wear eye goggles or use equipment such as HPDs to reduce the risk of injury. Eyewash stations should be provided where a worker is exposed to potential contact with a biological or chemical substance (Canadian Centre for Occupational Health and Safety, 2010). Nurses in occupational health settings can reinforce use of protective devices and ensure that things such as eyewash stations are in close proximity to the risk for injury.

Preventing hearing loss requires individuals to avoid exposure to continuously high noise levels and brief, loud impulse noise. The potential for hearing loss increases as the decibel level rises. Various provincial jurisdictions mandate occupational noise exposure limits (*Alberta Occupational Health & Safety Act*, 2009). HPDs should be worn by patients who must

* BOX 47-10 RESEARCH HIGHLIGHT

Self-Reported Sensory Impairment and Life Satisfaction in Older French-Speaking Adults

Research Focus

Vision and hearing loss are known to have a negative impact on quality of life. There have been few studies that examined the relationship between sensory impairment and life satisfaction.

Research Abstract

The purpose of this study was to examine the contribution of sensory impairments to life satisfaction in the elderly. A secondary data analysis was conducted with 826 older French-speaking participants in a larger study. Hierarchical regression analysis was used to determine the role played by four sets of variables in life satisfaction: the demographic, health, lifestyle, and sensory impairment variables (vision and hearing). The final model explained 36% of the variance. The sensory impairment variables contributed significantly to the model. The findings indicate that vision and hearing are important components of life satisfaction.

Evidence-Informed Practice

- Determine if the individual has any aids.
- Determine whether they use these aids.
- Determine the last time they had their vision and hearing tested; did they follow through with the recommendations by the practitioner?
- Speak with a family member to convince the older adult to use the aids.
- Provide education on the use and care of the aids.
- Conduct vision and hearing screening regularly.

Reference: Bourque, P., Léger, C., Pushkar, D., & Béland, F. (2007). Self-reported sensory impairment and life satisfaction in older French-speaking adults. *Canadian Journal of Nursing Research*, 39(4), 154–171.



work around noise. Earplugs and earphones are useful in blocking high-decibel sounds (Box 47-10).

Another means of prevention involves regular immunization of children against diseases capable of causing hearing loss (e.g., rubella, mumps, and measles). Public health nurses, nurse practitioners, and nurses who work in physicians' offices, schools, and community clinics should reinforce the importance of early and timely immunization. When a child or an adult develops any type of health problem, caution should be used in prescribing drugs that are ototoxic.

Use of Assistive Devices. Health promotion requires appropriate use of assistive aids and good, routine hygiene measures. Patients who wear corrective contact lenses, eyeglasses, or hearing aids should make sure that they are kept clean, accessible, and functional (see Chapter 37). It is critical for contact lens wearers to frequently clean lenses and use the appropriate solutions for cleaning and disinfection. With the rise in the use of soft contact lenses, particularly extended-wear lenses, some patients have become casual with regard to both the care and the wearing time of the contacts; as a result, the number of serious corneal infections has increased. Infrequent lens disinfection, contamination of lens storage cases and contact lens solutions, and use of homemade saline add to a patient's risk.

► BOX 47-11

Troubleshooting Hearing Aid Malfunction**Objectives**

- Patient and family member will identify source of malfunction in hearing aid.
- Patient and family member will demonstrate hearing aid care.

Teaching Strategies

- Show patient and family member locations on hearing aid device where damage (e.g., cracks, fraying) is likely to occur: ear mould or case, earphone, dials, cord, and connection plugs.
- Demonstrate battery replacement and stress the importance of having an extra set of unused batteries available.
- Review method to check volume: turn dial to maximum gain and then check. Is voice clear?
- Consult manufacturer's directions for specific care measures for cleaning battery case and ear mould.
- Review factors to report to hearing aid laboratory: static, distortion of sound, poor volume quality.

Evaluation

- Ask patient and family member to describe types of common malfunctions with hearing aid.
- Ask patient and family to demonstrate battery removal and cleaning of the device.

Many people are reluctant to wear a hearing aid (Adams-Wendling & Pimple, 2008). Several factors may determine a person's likelihood for wearing a hearing aid: perceived need for improved hearing, attitude toward the hearing problem, and motivation to seek solutions. Cost may also be a concern for having hearing assessed and for purchasing a hearing aid if the patient is not covered by a provincial health plan. In some provinces, hearing aids must be purchased from an approved dispenser or dealer for the cost to be covered by the province's health program (Canadian Hard of Hearing Association, 2010).

Acknowledging a need to improve hearing is a person's first step. You can give patients useful information on the benefits of wearing a hearing aid. A wide variety of aids are available that may not only successfully enhance a person's hearing but can also be cosmetically acceptable. Chapter 37 summarizes the types of hearing aids available and tips for proper care and use. It is also important to have a significant other available to assist with hearing aid adjustment (Box 47-11).

If a patient has any of the following ear conditions, a hearing aid cannot be used: visible congenital or traumatic deformity of the ear, active drainage in the last 90 days, sudden or progressive hearing loss within the last 90 days, acute or chronic dizziness, unilateral sudden hearing loss within the last 90 days, visible cerumen accumulation or a foreign body in the ear canal, pain or discomfort in the ear, or an audiometric air-bone gap of 15 decibels or greater. All but the last of these can be detected on physical examination. Referrals to or recommendations that the patient see an otolaryngologist or audiologist for further counselling should be made (Ebersole et al., 2007).

Another option for those with severe to profound hearing loss is a cochlear implant. This is a small, complex electronic device that can help provide a sense of sound to a person who is profoundly deaf or severely hard of hearing. The implant

consists of an external portion that sits behind the ear and a second portion that is surgically placed under the skin. An implant does not restore normal hearing. Instead, it can give a deaf person a useful representation of sounds in the environment and help him or her understand speech.

Promoting Meaningful Stimulation. Life becomes more enriching and satisfying when meaningful and pleasant stimuli exist within a person's environment. You can help patients make adjustments to their environment in many ways so that it becomes more stimulating. To do this, consider the normal physiological changes that accompany sensory deficits.

Vision. As a result of the normal changes of aging, the pupil's ability to adjust to light diminishes. As a result, older adults are often more sensitive to glare. You can suggest ways for the patient to minimize glare by selecting satin and non-gloss finishes for walls and countertops in the home, selecting a tile pattern for flooring, and choosing sheer curtains, tinted windows, or adjustable shades to reduce outdoor light. Wearing sunglasses outside can reduce the glare of direct sunlight.

The ability to read is important to everyone. Therefore, patients should be encouraged to use their glasses whenever possible (e.g., during procedures and patient instruction), which helps patients remain oriented, maintain some control, and retain their dignity. Patients with reduced visual acuity may need more than corrective lenses. A pocket magnifier can help a patient read most printed material. Telescopic lens eyeglasses are smaller, are easier to focus, and have a greater range. Books and other publications are also available in larger print. If a patient has a legal or other important document he or she wishes to read, standard copying machines have enlarging capabilities. Closed-circuit television magnifying units or portable or desktop video magnifiers using solid-state digital technology enlarge written characters. Minimum and maximum magnification varies from 12 to 60 times the original, depending on the screen size. As well, many word processing programs allow print to be enlarged. Audio-recorded books are available and can be readily purchased in bookstores or borrowed from public libraries or CNIB.

With aging, a person experiences a change in colour perception. You can offer suggestions of ways the patient may decorate a room and paint hallways or stairwells so that differentiations can be made in surfaces and objects in a room.

Hearing. To maximize residual hearing function, you work closely with the patient to suggest ways to modify the environment. Telephones and televisions can be amplified. Alarm clocks that shake the bed or activate a flashing light are useful devices. An innovative way to enrich the lives of those with a hearing impairment is recorded music. Some patients with severe hearing loss can hear music recorded in the low-frequency sound cycles. Closed captioning, in which audio content and nonspeech information, such as the identity of speakers and sound effects, are described using words or symbols, is available for many television programs.

One way to help an individual with a hearing loss is to ensure that the problem is not impacted cerumen. Removal of cerumen by irrigation (see Chapter 37) can significantly improve not only the patient's hearing ability but also the patient's mental status (Armstrong, 2009).

Taste and Smell. You can easily promote the sense of taste by using measures to enhance remaining taste perception. Good oral hygiene keeps the taste buds well hydrated. Taste

perception is heightened if foods are well seasoned, differently textured, and eaten separately. Flavoured vinegar or lemon juice can add tartness to food. Ask the patient what foods appeal most to taste. If taste perception is improved, food intake and appetite will also improve.

Stimulation of the sense of smell with aromas such as brewing coffee, cooking garlic, and baking bread can heighten taste sensation. Avoid blending or mixing foods because these actions make it difficult to identify tastes. Older adults should chew food thoroughly to allow more food to contact the remaining taste buds.

Smell can be improved by strengthening pleasant olfactory stimulation. A patient's environment can be made more pleasant with smells such as cologne, mild room deodorizers, fragrant flowers, and sachets, although you must assess the patient for allergies or sensitivities before using these items. Certain aromas may actually cause patients to lose their appetites.

Removal of unpleasant odours improves the quality of a person's environment. You should keep a patient's room clean, empty bedpans or urinals after use, remove and dispose of soiled dressings, and keep bathroom doors closed.

Touch. Patients with reduced tactile sensation usually have the impairment over a limited portion of their bodies. You can stimulate existing function by using touch therapeutically. If the patient is willing to be touched, hair brushing, a back rub, and touching of the arms or shoulders are ways of increasing tactile contact. When sensation is reduced, firm pressure may be necessary for the patient to feel your hand. Turning and repositioning can also improve the quality of tactile sensation. When invasive procedures are being performed, it is important to use touch by holding the patient's hands and keeping them warm and dry.

If a patient is overly sensitive to tactile stimuli (**hyperesthesia**), you must minimize irritating stimuli. Keeping bed linens loose to minimize direct contact with the patient and protecting the skin from exposure to irritants are helpful measures. If the patient has numbness and tingling or pain in the hands, as with carpal tunnel syndrome, special wrist splints may be worn to dorsiflex the wrist to relieve the nerve pressure. For those patients who use computers, special keyboards and wrist pads are available to decrease the pressure on the median nerve, aid in relief of pain, and promote healing.

Establishing Safe Environments. When sensory function becomes impaired, individuals become less secure and the world around them becomes smaller. Older adults in particular find it important to feel secure about their immediate environment. Feeling safe allows a person to function within the home and helps provide a sense of independence. You can suggest various strategies to assist patients in making their living environment safer without restricting their independence. During a home visit or while completing an examination in the clinic, suggestions for home safety can be discussed. The nature of the actual or potential sensory loss determines the safety precautions taken.

Adaptations for Visual Loss. When a patient experiences a decrease in visual acuity, peripheral vision, adaptation to the dark, and depth perception, safety becomes a concern. With reduced peripheral vision, a patient cannot see panoramically because the outer visual field is less discrete. This creates a special hazard for driving or walking in crowded areas. Adults with reduced adaptation to the dark require three times as much light to see objects as they did as young adults. With

reduced depth perception, a person cannot see how far away objects are located, making walking down stairs or over uneven surfaces dangerous.

safety alert To create a safe environment, the nurse begins by looking at the results of the home environment assessment (see Chapter 36).

Driving can also be a safety hazard. Reduced peripheral vision may prevent a driver from seeing a car in an adjacent lane. Reduced adaptation to the dark and sensitivity to glare make driving at night a significant risk. Although vision is a primary consideration for safety, other factors exist as well. In the case of older adults, decreased reaction time, reduced hearing, and decreased strength in the legs and arms may further compromise driving skills. Safety tips for those who continue to drive include driving in familiar areas, not driving during rush hour, avoiding major highways for local drives, using rear-view and side-view mirrors when changing lanes, avoiding driving at dusk or at night, keeping the car in good working condition, and carrying a cellular phone (but not using it while driving). Older drivers with visual impairment are 40% more likely to have caused a collision than those without visual impairment. Auto collisions are the number one cause of accidental death in 65- to 74-year-olds (Government of Alberta Transportation, n.d.).

In Ontario, drivers over the age of 80 are required to renew their licenses every two years. The renewal process involves a vision test, a written test, a group educational session, and a driving test for some applicants (Ontario Ministry of Transportation, n.d.). British Columbia requires a driver's retest for individuals approaching their 80th birthdays. Drivers need to complete a medical examination, vision test, and road test (BCAA Traffic Safety Foundation Mature Drivers Program, n.d.).

Visual alterations can make conducting normal activities of daily living more difficult. Because of reduced depth perception, patients can trip on throw rugs, runners, or the edge of stairs. Flooring or carpeting should be kept in good repair. Advise the patient to use low-pile carpeting. Thresholds between rooms should be level with the floor. Clutter should be removed to ensure clear pathways for walking. Furniture should be arranged so that the patient can move about easily without fear of tripping or running into objects. Any stairwell should have a securely fastened handrail extending the full length of the stairs.

Front and back entrances to homes, work areas, and stairwells need to be properly lit. Light fixtures need higher-wattage bulbs with wider illumination. Although less energy efficient, incandescent lighting may be preferred over fluorescent lighting because of the flickering of fluorescent lights. The CNIB Web site offers suggestions for lighting and other modifications for the visually impaired. A light switch should be located at the top and bottom of stairwells. It is also important that lighting on the stairs does not cast shadows. You should ensure that the patient is able to see the edge of each step clearly, especially the first and last steps. When possible, steps inside and outside the home should be replaced with ramps.

When a patient is unable to see visual contrasts, a number of interventions can be helpful. Sometimes settings on electrical appliances and equipment are only highlighted in black and white or shades of grey. Coloured tape, paint, nail polish,

or raised label dots can be used to colour-code appliance dials. Colour can also be useful to highlight the edge of stairs. Applying a broad strip of coloured tape at the stair edge can help a person better see the edges. Tour the home with the patient to find opportunities for colour-coding. Telephones with large numbers may be helpful.

You can also ensure that the patient is able to self-administer medications safely. Labels on medication containers should be in large print. A friend or spouse should always be familiar with dosage schedules. Using a magnifying glass or having family members read prescription medication labels for the patient may be helpful. Audible prescription labelling may become more common in the future (McMahon & Curtis, 2009). People who are visually impaired may have some difficulty manipulating eyedroppers. Eye-drop dispensers are available and often allow older or people with vision loss to independently administer their drops.

Adaptations for Reduced Hearing. Important environmental sounds may best be heard if amplified or changed to a lower-pitched, buzzer-like sound. Lamps are available that respond with light to sounds such as doorbells, burglar alarms, smoke detectors, and babies crying. These lamps can be purchased from hearing aid dealers, telephone companies, and appliance stores. Signalling devices allow the person with hearing loss greater independence. Family members or anyone who calls the patient regularly should learn to let the telephone ring for longer periods. Amplified receivers for telephones and telephone communications devices use a computer and a printer to transfer words over the telephone for people who are hearing impaired. Both sender and receiver must have the special device to complete a call. Telecommunication relay services (TRS) are available from most telephone companies. A telephone operator service translates voice to text and vice versa. Video relay services (VRS) are also available. VRS enables individuals with hearing disabilities who use American Sign Language to communicate with voice telephone users through video equipment rather than through typed text. Video equipment links the VRS user with an operator so that they can see and communicate with each other in signed conversation (Federal Communications Commission, 2010). The Canadian Hard of Hearing Association (2009) document entitled *Keys to the Communication Revolution* provides a list of key technological breakthroughs for the hearing impaired; however, some of these technologies are not readily available in Canada at this time.

Adaptations for Reduced Olfaction. A reduced sensitivity to odours means that the patient may be unable to smell leaking gas, a smouldering cigarette or fire, or spoiled food. The patient should use smoke and carbon monoxide detectors and other alternative precautions, such as checking ashtrays or placing cigarette butts in water. A patient can learn to check dates on food packages and the colour and texture of food. Leftovers should be kept in labelled containers with the preparation date. Pilot gas flames should be checked visually or professionally on a regular basis (Griggs, 2008).

Adaptations for Reduced Tactile Sensation. When patients have reduced sensation in their extremities, they are at risk for injury from exposure to temperature extremes. You should caution them on the use of water bottles or heating pads (see Chapter 46). The temperature of bathwater should be checked routinely before stepping into the tub. The temperature setting on the home water heater should be no higher than 48.8°C. Current Canadian regulations allow domestic

► BOX 47-12

Communication Methods for Patients Who Have a Hearing Impairment

- Get the patient's attention. Do not startle the patient when entering the room. Do not approach a patient from behind. Be sure the patient knows you wish to speak.
- Face the patient and stand or sit on the same level. Be sure your face and lips are illuminated to promote lip-reading. Keep hands away from the mouth.
- If the patient wears glasses, be sure they are clean so that your gestures and face can be seen.
- If the patient wears a hearing aid, make sure it is in place and working.
- Speak slowly and articulate clearly. Older adults may take longer to process verbal messages.
- Use a normal tone of voice and inflections of speech. Do not speak with something in your mouth.
- When you are not understood, rephrase rather than repeat the conversation.
- Use visible expressions. Speak with your hands, your face, and your eyes.
- Do not shout. Loud sounds are usually higher pitched and may impede hearing by accentuating vowel sounds and concealing consonants. If it is necessary to raise your voice, speak in lower tones.
- Speak toward the patient's best or unaffected ear. Use written information to enhance the spoken word.
- Do not restrict a deaf patient's hands. Ensure that IV lines are not secured to both of the patient's hands if the preferred method of communication is sign language.
- Avoid speaking from another room or while walking away.
- Make a note at the nursing station that the patient has a hearing impairment or is deaf.

water heaters to be factory set at 60°C. Researchers from the University of Toronto studied the cost-effectiveness of a proposed public health legislative and educational strategy to reduce scald injuries caused by tap water. The researchers concluded that legislation for lower thermostat settings on water heaters and annual educational notices for utility customers would decrease morbidity from tap water scalds and would also be cost effective (Han et al., 2007).

Promoting Communication. A sensory deficit can cause a person to feel isolated because of an inability to communicate with others. It is important for individuals to be able to interact with people whom they encounter. The nature of the sensory loss influences the methods and styles of communication that you can use (Box 47-12). Communication methods can also be taught to family members and significant others (see Chapter 17).

When beginning a conversation with a patient who has a hearing deficit, it helps to reduce any background noise by turning off or lowering the volume of any television, appliance, or radio. It is also helpful to have conversations in settings where the acoustics are better, which aids in controlling and muffling extraneous background noises. In a group setting, forming a semicircle in front of the patient helps him or her see who is speaking next, thereby fostering group involvement. The patient with a hearing impairment may be able to

speak normally. However, the deaf patient's inability to hear self-spoken words may cause serious speech alterations. Patients may use sign language (American or Quebec Sign Language), lip-read, write with a pad and pencil, or learn to use a computer for communication. Special communication boards that contain common terms used in nursing care (e.g., pain, bathroom, dizzy, or walk) help patients express their needs.

Patient instruction is one aspect of communication. Teaching booklets are available in large print. The patient who is blind may require more frequent and detailed verbal descriptions of information. This is particularly true if no instructional booklets are written in Braille. Patients can learn by listening to audiotapes or the sound portion of a televised teaching session. Patients with hearing impairment may benefit from written instructional materials and visual teaching aids (e.g., posters and graphs). Demonstrations are very useful. Also, owing to a 1997 Supreme Court ruling, provinces must now pay for sign language interpreters for deaf patients when they receive medical treatment.

Acute Care

When patients enter acute care settings for therapeutic management of sensory deficits or as a result of traumatic injury, you should try to maximize sensory function existing at the time. Safety is an obvious priority until sensory status is either stabilized or improved. For example, patients with sensory deficits have a high risk for falls in the acute care environment. It also becomes very important to know the extent of any existing sensory impairment before the acute episode of illness so that you can reinforce what the patient already knows about self-care or plan for more instruction before and following discharge.

Patients who are acutely ill are also at risk for developing sensory alterations. Your main challenge becomes introducing regular, meaningful stimulation so that patients maintain a clearer perception of their immediate environment. Ongoing explanations help orient the patient to any new stimuli within their environment and reduce fear and disorientation.

Orientation to the Environment. The patient with recent sensory impairment requires a complete orientation to the immediate environment. Reorientation to the institutional environment may be provided by ensuring that name tags on uniforms are visible, addressing the patient by name, explaining where the patient is (especially if patients are transported to different areas for treatment), and using conversational cues to time or location. Reduce the tendency for patients to become confused by offering short, simple, repeated explanations and reassurance. Family members and visitors can also help orient patients to the hospital surroundings.

Patients with serious visual impairment must feel comfortable in knowing the boundaries of the immediate environment. They may want to touch the boundaries of a room or objects to gain a sense of their surroundings. The patient may need to walk through a room and feel the walls to establish a sense of direction. You can help by describing furniture or equipment within the room. As it takes time to absorb a room's arrangement, the patient may need further reorientation, with the nurse explaining the location of key items (e.g., call light, telephone, and chair).

It is important to keep all objects in the same position and place. Simply moving a chair aside may create a dangerous safety hazard. Ensure that you ask the patient if any

item should be arranged to make ambulation easier. Traffic patterns should be kept clear, and use of furniture with sharp edges should be avoided. The patient who is blind needs extra time to perform tasks and a detailed description of how to perform an activity.

Patients confined to bed are at risk for sensory deprivation. Normally, movement gives an integrated awareness of the self through vestibular and tactile stimulation. A person's sensory perception is influenced by movement patterns. The limited movement of bedrest changes how a person interprets the environment; surroundings seem different, and objects seem to assume shapes different from normal. A person who is on bedrest requires routine stimulation through range-of-motion exercises, positioning, and participation in self-care activities (as appropriate). Comfort measures such as washing the patient's face and hands and providing back rubs can help improve the quality of stimulation and lessen the chance of sensory deprivation. Planning time to talk with patients is also essential. Explain unfamiliar environmental noises and sensations. As well, a calm, unhurried approach during contact with a patient gives you quality time to help reorient and familiarize the patient with care activities. The patient who is well enough to read will benefit from a variety of reading materials.

Controlling Sensory Stimuli. Excessive stimuli for patients at risk for sensory overload should be controlled. You can reduce sensory overload by organizing the care plan. Combining activities such as dressing changes, bathing, and vital sign measurement in one visit prevents the patient from becoming overly fatigued. Coordination with laboratory and radiology departments may help minimize the number of procedures the patient must undergo. Encourage, as appropriate, a family member to sit quietly with a patient or involve the patient in an undemanding, repetitive activity, such as combing hair. The patient also needs scheduled time for rest and quiet. Planning for rest periods often requires cooperation from family, visitors, and health care colleagues. Many nursing care units have instituted a set time for rest periods.

When patients experience sensory overload or deprivation, the resultant behaviour can be difficult for family or friends to accept. Encourage the family not to argue with or contradict the confused patient but to explain calmly the patient's location and identity and the time of day. Engaging the patient in a normal discussion about familiar topics may assist in reorientation. Prearranging tests and procedures with departments reduces the amount of time needed for tests and examinations. Anticipating patient needs, such as voiding, helps reduce uncomfortable stimuli.

You can also try to control extraneous noise in and around the patient's room. It may be necessary to ask a roommate to lower the volume on a television or to move the patient to a quieter room. Equipment noise should be kept to a minimum. Bedside equipment not in use, such as suction and oxygen equipment, should be turned off. You also should try to avoid abrupt loud noises, such as suddenly causing the overbed table to adjust to the lowest level. Nursing staff should also try to control laughter or conversation at the nurses' station. Nurses should allow patients to close room doors (Robinson et al., 2008).

When the patient leaves an acute care setting for home, you should communicate with colleagues in the home care setting about the interventions that helped the patient adapt to sensory problems. Similarly, information describing the patient's existing sensory deficits should be reported. Continuity of care is

achieved when the patient is required to make only minimal changes to the plan of care in the home setting.

Safety Measures. The patient with recent visual impairment often requires help with walking. The presence of an eye patch, frequently instilled eye drops, and the swelling of eyelid structures following surgery are just a few factors that cause a patient to need more assistance than usual. A sighted guide can give confidence to the visually impaired person and ensure safe mobility. The CNIB has published a manual for assisting someone with vision loss (CNIB, n.d., c). Touhy et al. (2012) list four suggestions for a sighted guide:

- Ask the patient if he or she wants a “sighted guide.”
- If assistance is accepted, offer an elbow or arm. Instruct the patient to grasp your arm just above the elbow. If necessary, physically assist the person by guiding his or her hand to your arm or elbow.
- Go one half-step ahead and slightly to the side of the person. The shoulder of the person should be directly behind your shoulder. If the person is frail, place his or her hand on your forearm.
- Relax and walk at a comfortable pace. Warn the patient when you approach doorways or narrow spaces.

While walking the patient, describe the course of movement and ensure that obstacles have been removed. A patient with visual impairment should never be left standing alone in an unfamiliar area. For patients who undergo eye surgery, it is important to teach family members techniques for assisting with ambulation. For those patients who are blind, mobility training is available from CNIB. Guide dogs may also prove useful (CNIB, n.d., b). A patient who spends considerable time in bed should have a call light nearby. Necessary objects should be placed in front of the patient to prevent falls caused by reaching over the bedside. Side rails may also be useful to provide added security. At night, a night light reduces the time required for the eyes to adapt to the dark and allows the patient to see well enough to function without keeping the regular light on.

Face the patient when speaking, use simple sentences, and speak more slowly and at a normal volume. It is wise to note on the intercom button and the patient’s chart if the patient is deaf or blind. A patient lacking the ability to speak cannot call out for assistance. Patients should have message boards or the call light easily available.

Patients with reduced tactile sensation risk injury when their conditions confine them to bed because they are unable to sense pressure on bony prominences or the need to change position. These patients rely on nurses for timely repositioning, moving tubes or devices they may be lying on, and turning them to avoid skin breakdown. When the patient is less able to sense temperature variations, you should be extra cautious when applying heat and cold therapies and preparing bathwater. You must check the condition of the patient’s skin frequently.

A commonly used skin assessment tool is the Braden Scale (see Chapter 46, p. 1260) (Braden & Bergstrom, 1988), for assessing pressure ulcer risk for patients in acute or long-term care as well as homes and community settings. One component of the Braden Scale is sensory impairment. Canadian recommendations include assessing all acute care admissions for pressure ulcer risk and at 48-hour intervals thereafter (every shift for high-risk patients); assessing long-term care patients on admission and every 48 hours for the first week; educating family members and caregivers about skin

assessments and care for patients in the community (RNAO, 2005; Stevenson, 2009).

Restorative and Continuing Care

Maintaining Healthy Lifestyles. After a patient has experienced a sensory loss, it becomes important to understand the implications of the loss and to make the adjustments needed to continue a normal lifestyle. Sensory impairments need not prevent a person from leading an active, rewarding life. Many of the interventions applicable to health promotion, such as adapting the home environment, can be used after a patient leaves an acute care setting.

Understanding Sensory Loss. Patients who have experienced a recent loss must understand how to adapt so that their living environments can be safe and appropriately stimulating. Family members should understand how a patient’s sensory impairment affects normal daily activities. Family and friends can be more supportive when they understand sensory deficits and the types of elements that worsen or lessen sensory problems. Resources are available within a community that provide information that assists patients with personal management needs. For example, CNIB, the Canadian Hearing Society, and the Canadian Association of the Deaf offer resource materials and product information.

Socialization. The ability to communicate is gratifying. It tests our intellect, opens opportunities, and allows us to exchange the feelings we have about others. When interactions are hindered by sensory alterations, a person can feel ineffective and lose self-esteem.

Interacting with others can become a burden for many patients with sensory alterations. Asking people to continually repeat what they say is both embarrassing and exhausting for a patient with hearing loss. Many patients lose the motivation to engage in social situations. As a person withdraws from interaction, a deep sense of loneliness can develop. You can introduce therapies to reduce loneliness, particularly for older patients (Box 47-13). In addition, family members need to learn to focus on a person’s ability rather than on the disability. It should not be assumed, for example, that a person who is hard of hearing does not wish to speak. A person who is blind can still enjoy a walk through a park with a companion describing the sights around them.

* BOX 47-13 FOCUS ON OLDER ADULTS

Interaction Strategies With a Focus on Older Adults

- Spend time with a person, either in silence or in conversation.
- Use physical contact—holding a hand, embracing a shoulder—to convey caring.
- Recommend alterations in living arrangements if physical isolation is a factor.
- Assist older adults to maintain contact with people important to them.
- Help obtain information about mutual help groups.
- Arrange for security escort services as needed.
- Suggest that the patient obtain a pet that is easy to care for.
- Link the patient with religious or other organizations attuned to the social needs of older adults.



Promoting Self-Care. The ability to perform self-care is essential for self-esteem. People with chronic conditions who are supported to perform self-care report a higher quality of life, independence, and self-esteem, along with lower levels of depression, anxiety, and fatigue (Robinson, 2010). Frequently, family members and nurses believe that patients with sensory impairments require assistance when, in fact, they can help themselves. Useful guidelines are available to assist patients with visual or tactile impairment so that they can help themselves with daily living activities. For example, a meal tray can be set up as though food on the tray and condiments and drinks around the tray are numbers on the face of a clock (Figure 47-5). The visually impaired patient can easily become oriented to the items after the nurse or family member explains each item's location.

The patient with visual problems may need assistance in reaching toilet facilities safely. Safety bars should be installed near the toilet. It may be helpful to have the bar a different colour than the wall for easier visibility. Towels should never be placed on safety bars because they may interfere with a person's grasp. Toilet paper should be within easy reach. The use of sharply contrasting colours, especially red, on drawers and other places helps promote functional independence. Choosing clothes that match can be an issue, but techniques such as hanging clothes together on a hanger or marking them with similar labels often overcome this difficulty. The patient's preference must always be considered when helping to arrange or buy clothes.

If tactile sense is diminished, the patient can dress more easily with zippers or Velcro strips, pullover sweaters or blouses, and elasticized waists. If a patient has partial paralysis and reduced sensation, the affected side should be dressed first.

Patients with proprioceptive problems may lose balance easily. Floor mats should have rubberized, skid-proof bottoms. They should be checked and replaced as needed. Bathrooms should have nonskid surfaces in the tub and shower. Grab bars should be installed either vertically or horizontally in tubs and showers, depending on how the patient is able to grasp or hold

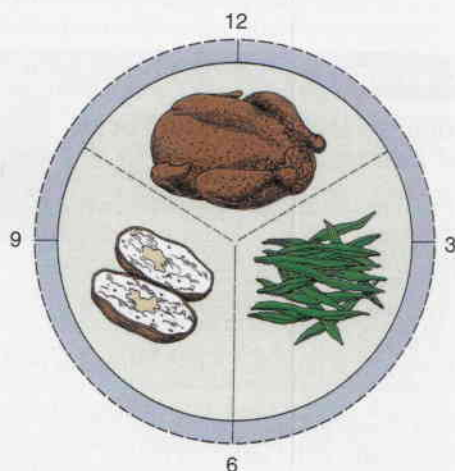


Figure 47-5 Location of food using the clock as a frame of reference.

on to the bar. You can instruct family members to supervise ambulation and sitting, make frequent checks to prevent falls, and help caution the patient against leaning forward.

Any sensory impairment has a significant influence on body image, and it is important for the patient to feel well groomed and attractive. Some patients may need assistance with basic grooming. Others may need assistance with medication selection, clothing identification, and learning to manage routine procedures, such as blood pressure and glucose monitoring. A variety of aids are available to help individuals with varying types of sensory deficits. It is important to assist patients in maintaining a degree of independence and in having as much control over the management of their care and lifestyle as possible.

❖Evaluation

Patient Care

It is essential to determine whether care measures maintain or improve patients' ability to interact and function within their environment. Only patients themselves will know if their sensory abilities are improved and which interventions or therapies are the most successful (Figure 47-6). To evaluate the

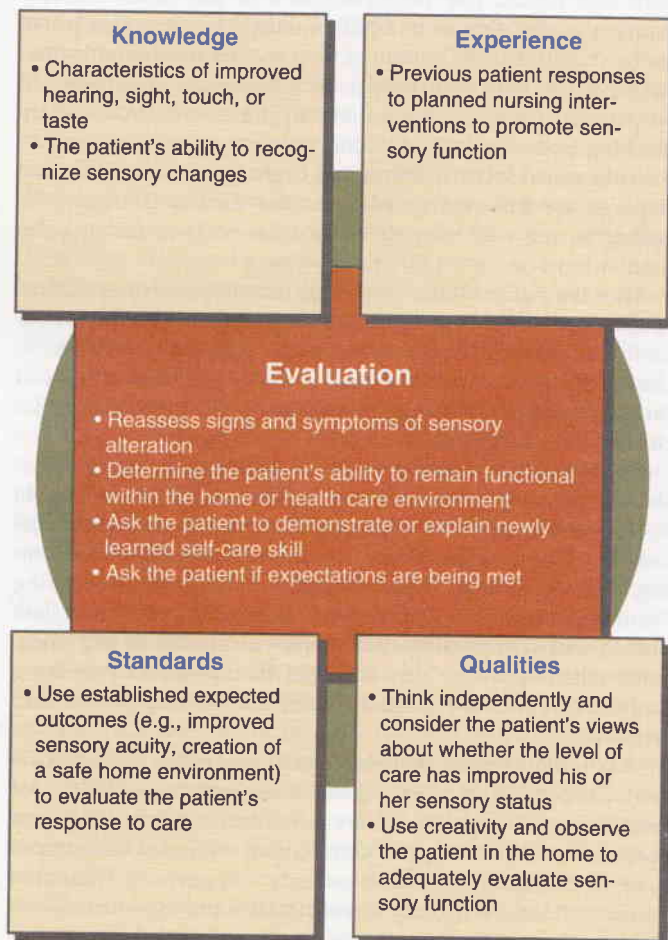


Figure 47-6 Critical thinking model for sensory alterations evaluation.

effectiveness of nursing interventions, you will use critical thinking and make comparisons with the baseline sensory assessment data to evaluate if sensory alterations have changed.

As the nurse, you determine if expected outcomes have been met. The nature of the sensory alteration influences the way you evaluate the outcome of care. Look back on the goals and interventions for nursing care. Discuss goals and interventions with the patient, family, and multidisciplinary team members and reflect on their perspectives of meeting these goals. What went well? What could have been improved? What still needs to be done? What is the patient's perception of the nursing care? For example, you use proper communication techniques with a patient with a hearing deficit and then evaluate whether the patient has gained the ability to hear or interact more effectively. When expected outcomes have not been achieved, it may be necessary to change interventions or alter the patient's environment. Family members may need to be involved in support of the patient. You may also consult with the multidisciplinary team (e.g., physician, occupational therapist, audiologist) for suggestions to achieve unmet needs. The patient must be involved in all evaluation and planning activities.

If nursing care has been directed at improving sensory acuity, evaluate the integrity of the sensory organs and the patient's ability to perceive stimuli. Any interventions designed to relieve problems associated with sensory alterations are evaluated on the basis of the patient's ability to function normally without injury. When you attempt to directly or indirectly (through education) alter the patient's environment, evaluation is directed at observing whether the patient makes environmental changes. When patient teaching is designed to improve a patient's sensory function, it is important to determine whether the patient is following recommended therapies. Asking the patient to explain or demonstrate self-care skills evaluates the level of learning that has occurred. It may be necessary to reinforce previous instruction if learning has not taken place.

Patient Expectations

If you have successfully developed a good relationship with a patient and have a therapeutic plan of care, subtle behaviours often indicate the level of the patient's satisfaction. Note whether the patient responds appropriately, such as by smiling. As well, observe whether the patient interacts more and is not asking to have information repeated. Ask the patient, "Can you tell me if you feel we have done all we can do to help improve your ability to hear?" If the patient's expectations have not been met, then you need to spend more time understanding the patient's needs and specific preferences. Ask the patient, "What else can the health care team do to meet your needs?" Working closely with the patient and family will enable you to redefine expectations that can be realistically met within the limits of the patient's condition and therapies. Interventions are effective when goals and expectations have been met.

❖ KEY CONCEPTS

- When sensory function is impaired, the sense of self is impaired and can affect one's ability to socialize.
- Uncorrected vision impairment can lead to falls, fractures, depression, social isolation, behavioural changes, and cognitive impairment.

- Sensory deprivation results from an inadequate quality or quantity of sensory stimuli.
- Aging usually results in a gradual decline of acuity in all senses.
- Do not confuse medical conditions or disease symptoms with normal aging changes.
- Patients who are older, immobilized, or confined in isolated environments are at risk for sensory alterations.
- Assessment of a patient's health promotion habits helps reveal risks for sensory impairment.
- An individual may not admit to a sensory loss.
- An assessment of hazards in the environment requires the nurse to tour living areas in the home and to look for conditions that increase the chances of accidents.
- The plan of care for patients with sensory alterations needs to include participation by family members.
- The plan of care may differ if the sensory alteration is chronic or short term in nature.
- Care of patients at risk for sensory deprivation includes introducing meaningful and pleasant stimuli for all senses.
- To prevent sensory overload, the nurse controls stimuli and orients the patient to the environment.

❖ CRITICAL THINKING EXERCISES

1. Mr. Tully is a 54-year-old farmer who is having a physical examination. Overall, his health is good. His wife reports that over the past year, he has lost interest in being involved in social gatherings, is more irritable, and often has asked her to repeat what was said. Recently, he has complained of a constant buzzing in his ears. What assessment data are needed? What specific interventions may be needed?
2. Mrs. Marfell, 79 years old, is visiting the outpatient cardiac centre for a routine checkup. You notice that she needed help reading the physical forms. She also told you she is having increased difficulty driving at night. What additional assessment data should you gather from Mrs. Marfell?
3. You have an opportunity to speak with a group of parents and students regarding the importance of hearing protection. What information would you share with this varied age group to promote healthy hearing?

❖ REVIEW QUESTIONS

1. The following sense enables a person to be aware of the position and movement of body parts without seeing them:
 1. Auditory
 2. Kinesthetic
 3. Tactile
 4. Gustatory
2. A sense that allows a person to recognize an object's size, shape, and texture is
 1. Stereognostic
 2. Kinesthetic
 3. Tactile
 4. Gustatory
3. A patient who is in constant pain and undergoes frequent monitoring of vital signs is at risk for experiencing sensory
 1. Deprivation
 2. Deficits
 3. Overload
 4. Stimuli

4. Proprioceptive changes after 60 years of age include increased
 1. Hearing and vision impairment
 2. Difficulty with balance, spatial orientation, and coordination
 3. Hearing impairment and difficulty with balance and coordination
 4. Vision impairment and difficulty with spatial orientation
5. For a patient who has a hearing impairment, the nurse should
 1. Approach a patient quietly from behind
 2. Face the patient when speaking and use a louder-than-normal tone of voice
 3. Select a public area to have a spoken conversation
 4. Face the patient when speaking and speak slower and at a normal volume
6. When obtaining a history of the patient's hearing loss, the nurse should ask,
 1. "How long have you been deaf?"
 2. "Do you also have vision problems?"
 3. "Why don't you pay attention to me while I speak?"
 4. "How does your hearing now compare with your hearing a year ago?"
7. A realistic goal for an older adult patient who drives is to
 1. Drive very slowly all of the time
 2. Use rear-view and side-view mirrors when changing lanes
 3. Always drive at night to prevent sun glare
 4. Drive during rush hour when others are on the road
8. To prevent hearing impairment among children, a nursing intervention is to teach parents, schoolteachers, and children to
 1. Avoid activities in which crowds and loud noises occur
 2. Delay childhood immunizations until hearing can be verified
 3. Take precautions when involved in activities associated with high-intensity noises
 4. Administer antibiotics to reduce the risk of infections
9. A high priority in a home assessment for a patient with diminished olfaction is the inclusion of
 1. A low-temperature water setting
 2. Extra lighting in hallways
 3. Smoke detectors on all levels
 4. Amplified telephone receivers
10. Sensory deficits happen when a problem with sensory reception or perception occurs. As a result, patients may
 1. Withdraw socially to cope with the loss
 2. Rely solely on one sense
 3. Respond normally to stimuli
 4. Function safely within their environment

✦ RECOMMENDED WEB SITES

Canadian Helen Keller Centre: <http://www.chkc.org/>

The Canadian Helen Keller Centre (CHKC) provides training programs to individuals who are deaf-blind to help them increase and maintain their independence and autonomy, access services in the community, and decrease isolation. The Web site provides links relevant to deaf-blindness and communicating with people who are deaf-blind.

Canadian National Institute for the Blind (CNIB): <http://www.cnib.ca/>

CNIB is a national, voluntary organization that offers information and support to people with vision loss.

CNIB, Guide Dogs: <http://www.cnib.ca/en/living/guide-dog/>

Canadian Association of the Deaf: <http://www.cad.ca/>

Canadian Hard of Hearing Association: <http://www.chha.ca/chha/>

Canadian Hearing Aid Subsidies: http://chha.ca/documents/Hearing_Aid_Subsidies_Across_Canada.pdf

Canadian Ophthalmological Society: <http://www.eyesite.ca/english/index.htm>

Misericordia Health Centre, Focus on Falls Prevention: <http://www.misericordia.mb.ca/AboutUs/VisionScreening.html>

The adapted Vision Screening Tool was used in this facility and is being used in various parts of Canada to conduct vision screening of older adults in hospitals, long-term care facilities, and the community.

The Canadian Hearing Society: <http://www.chs.ca/>

The Canadian Hearing Society provides services that prevent hearing loss and promote the independence of deaf and hearing-impaired people.

RNAO, Nursing Best Practice Guidelines: Prevention of Falls and Fall Injuries in the Older Adult: http://ltctoolkit.rnao.ca/sites/ltc/files/resources/falls/BestPracticesStandards/Falls1_1.FALLSBPG.pdf

SeeHear Canada: <http://seehear.ca/>

SeeHear screens hearing and vision for both elementary-aged children in their schools and adults in their workplace.

Voice for Hearing Impaired Children: <http://www.voicefordeafkids.com/>

VoicePrint: <http://www.voiceprintcanada.com>

VoicePrint is a nonprofit audio newsstand that broadcasts international, national, regional, and local stories from over 600 Canadian newspapers and magazines.

Review Question Answers

1. 2, 2, 1, 3, 3, 4, 2, 5, 4, 6, 4, 7, 2, 8, 3, 9, 3, 10, 1

Rationales for the Review Questions appear at the end of the book.

Care of Surgical Patients

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objectives

Mastery of content in this chapter will enable you to:

- Define the key terms listed.
- Understand the aspects of perioperative nursing care.
- Differentiate between classifications of surgery and types of anaesthesia.
- List factors to include in the preoperative, intraoperative, and postoperative assessment of a surgical patient.
- Demonstrate postoperative exercises: diaphragmatic breathing, coughing, turning, and leg exercises.
- Design a preoperative teaching plan.
- Prepare a patient for surgery.
- Explain the nurse's role in the operating room.
- Describe the rationales for nursing interventions designed to prevent postoperative complications.
- Explain the differences and similarities in caring for ambulatory (day) surgical patients versus inpatient surgical patients.

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key terms

- | | |
|---------------------------------|---|
| Abdominal gas, p. 1366 | Malignant hyperthermia, p. 1361 |
| Antiembolism stockings, p. 1356 | Paralytic ileus, p. 1362 |
| Atelectasis, p. 1330 | Perioperative nursing, p. 1325 |
| Bariatric, p. 1330 | Postanesthesia Recovery Score (PARS), p. 1358 |
| Cholecystectomy, p. 1327 | Postanesthesia Recovery Score for Ambulatory Patients (PARSAP), p. 1359 |
| Circulating nurse, p. 1355 | Preoperative teaching plan, p. 1338 |
| Clinical pathways, p. 1341 | Regional anaesthesia, p. 1356 |
| Conscious sedation, p. 1356 | Same-day surgery, p. 1327 |
| Convalescence, p. 1357 | Scrub nurse, p. 1355 |
| Dehiscence, p. 1332 | Sequential compression device, p. 1356 |
| Dermatomes, p. 1361 | |
| General anaesthesia, p. 1356 | |
| Informed consent, p. 1341 | |
| Latex sensitivity, p. 1352 | |
| Local anaesthesia, p. 1356 | |

Perioperative nursing care includes care given before (preoperative), during (intraoperative), and after (postoperative) surgery. Surgical procedures generally take place in a hospital, although some minor surgical procedures can be conducted in a physician's office. Perioperative nursing is based on your understanding of several important principles, including the following:

- Excellence in perioperative practice
- Interprofessional teamwork
- Effective and therapeutic communication and collaboration with the patient, the patient's family, and the surgical team
- Effective and efficient patient assessment and intervention in all phases
- Advocacy on behalf of the patient and the patient's family
- Understanding of cost containment
- Understanding of patient safety

You must practise surgical asepsis, thoroughly document care, and emphasize patient safety in all phases of care. The nursing process provides a basis for perioperative nursing, with you individualizing strategies so that the patient receives continuity of care from admission into the health care system through convalescence. By using the nursing process, you can help to anticipate needs and minimize complications. The World Health Organization has produced the Surgical Safety Checklist (WHO, 2008) to facilitate patient safety throughout the operative procedure.

The continuing care of the surgical patient has shifted from hospital-based convalescence to home-based convalescence, with the patient and family assuming increased responsibility. As the length of hospital stays decreases, the educational needs of the patients and their families increase. Patients are sent home often with complex medical or surgical conditions that require education and follow-up. Effective teaching and early discharge planning are essential to ensure positive surgical outcomes (Suhonen & Leino-Kilpi, 2006).

History of Surgical Nursing

Surgery gave physicians the means to treat conditions that were difficult or impossible to manage solely through medicinal applications. Early surgeons had little knowledge of the principles of asepsis, and anaesthesia techniques were primitive and unsafe. Indeed, the early surgeon's success was based on speed. The discovery of anaesthesia in the 1840s revolutionized surgery. Anaesthesia provided a combination of analgesia, muscle relaxation, and amnesia, which allowed the time for surgical procedure to be extended. The value of handwashing and the development of germ theory in the 1860s (Pasteur) and 1870s (Koch) triggered the study of aseptic technique, which reduced postoperative infections and mortality. Joseph Lister (1827–1912) was associated with antiseptics or listerism. Initially, antiseptics was one way to protect patients from pathogens in the environment. After experimenting with carbolic acid dressings and continuous carbolic acid sprays during surgical operations, in 1867 Lister described a reduced incidence of gangrene and mortality. He eventually abandoned carbolic acid by 1890, when Koch demonstrated heat to be more effective than chemicals for sterilizing instruments (Porter, 1997). Therefore, Pasteur, Lister, and Koch helped provide a scientific basis to prevent infection in hospitals.

Asepsis and the techniques associated with it ensured that the patient did not acquire in-hospital infections. Germ theory influenced nursing practice through the creation of carefully delineated procedures designed to preserve asepsis (McPherson, 1996). Nurses working in the first operating rooms (ORs) cleaned the rooms and equipment, prepared the solutions and dressings, performed technical tasks such as obtaining supplies, administered anaesthetics as graduates, and occasionally accompanied patients to the surgical ward to deliver nursing care.

In Canada, OR nursing began to be part of training at Montreal General Hospital in 1890 ("Nurses life in the Montreal General Hospital," 1892). Toronto General Hospital, St. Michael's Hospital in Toronto, and Winnipeg General Hospital quickly followed suit. OR nursing in the early twentieth century became organized around the technology of surgery. Nurses ensured that the aseptic conditions of the surgical environment were maintained by all personnel and, along with physicians, became the first specialists in anaesthesia.

As sterile ORs developed, OR nursing became a specialty separate from anaesthesia and surgical nursing. Two roles emerged: the sterile scrub nurse, who handled the instruments and passed them to the surgeon, and the circulating nurse, who ensured that all sponges used in operations were accounted for outside the patient's body and that aseptic conditions were maintained. OR nursing was confined to activities in and around the OR and was a well-established field of practice by the 1920s.

During the Second World War, a proliferation of courses that focused on OR nursing developed. These postdiploma courses subsequently enabled nurses to join the military, where they were highly valued to work with trauma patients (Toman et al., 2006). During the Second World War, the expertise of nurses in caring for soldiers with traumatic injuries accelerated. "The primary purpose of dressings shifted from one of limiting blood loss in the field to one of preventing infection and accelerating healing—while also shifting the level of knowledge and expertise to perform dressing changes and treat the underlying wounds" (Toman, 2007, p. 135).

The trend of including OR experience in training continued into the 1960s. However, during the 1970s, a change occurred in nursing education, whereby nurses were expected to acquire a broad knowledge base. As a result, many schools eliminated OR experience from the curriculum, believing that it focused only on manual skills (Sandelowski, 2000). What was not recognized was the role that OR nurses play in ensuring patients' comfort and safety and continuity of care before, during, and after surgery.

In 1956 in the United States, the Association of Operating Room Nurses (AORN) was formed. The organization developed standards of nursing practice that outlined the perioperative nurse's scope of responsibility. AORN was the first nursing organization to develop structure, process, and outcome standards as defined by the American Nurses Association. AORN has since changed its name to the Association of Perioperative Registered Nurses; however, AORN is still used as its acronym. The organization continues to be a driving force for the practice of perioperative nursing and works closely with Canadian associations.

In Canada, the Operating Room Nurses Association of Canada (ORNAC) was founded in 1983. The mission of this professional organization is the promotion and advancement of excellence in the provision of perioperative care to patients and the professional growth and personal enhancement of perioperative registered nurses. It sets the standards for Canadian perioperative nursing practice. Specifically, ORNAC values are (1) knowledge—education and research are essential components that guide practice, (2) collaboration—with nurses within the specialty, organizations, agencies, and other disciplines, (3) respect—for worth, quality, diversity, and the importance of the patients and of each other, (4) professionalism—to advance the specialty, and (5) continuous quality improvement—to achieve excellence. Opportunities exist in conjunction with the Canadian Nurses Association for registered nurses to obtain perioperative nursing certification. In addition to the National Association of PeriAnesthesia Nurses of Canada (NAPANc), there are provincial associations. For example, the Ontario PeriAnesthesia Nurses Association (OPANA) was founded in 1985 to represent all nurses involved in the care of patients pre- and postanaesthesia. These nursing environments are usually same-day (ambulatory) care, postanaesthetic care units, and preadmission units.

OPANA (2009) has developed standards of perianaesthesia nursing practice that are used in Ontario hospitals.

Same-Day (Ambulatory) Surgery

A recent change in the surgical field is the advent of same-day surgery also referred to as *ambulatory surgery* or *short-stay surgery*. These services are provided within a hospital setting. More than half of all surgical procedures are conducted on an outpatient basis, including ophthalmic, gastroenterological, gynecological, otorhinolaryngologic, orthopedic, cosmetic and restorative, and general procedures. The incidence of **same-day surgery**, in which the patient is admitted on the day of surgery, has the surgery, and then goes home the same day, has greatly increased. The process of admitting patients and then observing them overnight (23-hour admission) can also occur.

There are distinct benefits for the patient who has same-day surgery. Anaesthesia drugs that metabolize rapidly with few after-effects allow for shorter operative times. Nurses recognize the benefit of early postoperative ambulation and encourage patients to assume an active role in recovery. Same-day surgery also results in shorter hospital stays, as patients are usually discharged the day of surgery. This reduces the possibility of developing hospital-acquired infections, which occur when patients become colonized with bacteria found in the hospital setting. Procedures such as tumour biopsies and gallbladder removal (**cholecystectomy**) can now be done using laparoscopic procedures. Because of the small incision required, a laparoscopic cholecystectomy involves a hospital stay of only a few to 24 hours and a recovery period of a week. In contrast, a traditional open cholecystectomy requires a larger abdominal incision and involves a hospital stay of three to five days and a recovery period of at least four weeks. Thus, many surgeons use laparoscopic procedures for a variety of surgical interventions, thereby decreasing the length of surgery, hospitalization, and associated costs. Laparoscopic approaches are just one form of the increasingly used minimally invasive surgical techniques (MIS). For example, specialized instruments and cameras can be used for procedures such as pyeloplasty (Francis & Winfield, 2006) or total hip arthroscopy (Burden, 2007). Construction of new operating room suites is increasingly providing dedicated rooms for MIS, and thus OR nurses are being educated regarding their role related to the techniques as well as intraoperative patient care.

Same-day surgery requires that nurses provide extensive preoperative and postoperative teaching and assess the patient's available support systems and readiness for self-care. For example, discharge education should include potential complications and what to do about them, instructions on care of incision sites and any drains, diet and activity, telephone numbers to contact, and managing pain. Surgical day care nurses frequently call patients at home on the day after surgery to inquire about how recovery is progressing. As well, home care nurses must refer the patient to appropriate community agencies or services such as physiotherapy.

Scientific Knowledge Base

Classification of Surgery

Surgical procedures are classified according to seriousness, urgency, and purpose (Table 48-1). A procedure may fall into more than one classification. For example, surgical removal of a disfiguring scar is minor in seriousness, elective in urgency, and reconstructive in purpose. Frequently, the classes overlap.

An urgent procedure is also considered major in seriousness. As well, the same operation may be performed for different reasons on different patients. For example, a gastrectomy may be performed as an emergency procedure to resect a bleeding ulcer or as an urgent procedure to remove a cancerous growth. The classification indicates to you the level of care a patient might require. Hospitals have a system for prioritizing the booking of surgeries based on their classification.

The American Society of Anesthesiologists (ASA) assigns classification on the basis of a patient's physiological condition, independent of the proposed surgical procedure (Table 48-2). Intraoperative difficulties occur more frequently with patients who have a poor physical status classification (Rothrock, 2003). ASA physical status class I and class II patients are acceptable for ambulatory surgery. Patients in classes IV and V require inpatient surgery because they are at higher risk for complications (e.g., cardiac or pulmonary complications). The ASA classification system is used in Canadian hospitals.

Nursing Knowledge Base

Nursing knowledge offers important contributions for the care of the perioperative patient. For example, nursing research has shown the benefit of preoperative education in promoting positive patient outcomes after surgery. Structured preoperative teaching that includes, for example, the AORN (2004) standards and a return demonstration of postoperative exercises has been shown to improve outcomes such as pain severity, pulmonary function, length of stay, and patients' levels of anxiety.

Significant evidence-based knowledge is also available for proper wound care interventions. Nursing research has contributed to what is known about the characteristics of wound healing and the types of applications most likely to be beneficial (see Chapter 46).

Within the OR setting, knowledge has improved the standards for infection control and patient safety. For example, surgical hand scrubs (see Chapter 32) can now be performed without the use of brushes as a result of research that has shown the efficacy of alcohol-based hand antiseptics in reducing bacteria on the skin (Hobson et al., 1998). Evidence-based practice changes within the OR improve the quality of care for surgical patients and ultimately improve patient outcomes.

Critical Thinking

Successful critical thinking requires a synthesis of knowledge, information gathered from patients, experience, critical thinking qualities, and intellectual and professional standards. Clinical judgements require you to anticipate the information necessary, analyze the data, and make decisions regarding patient care. A patient's condition is always changing. During assessment (Figure 48-1), you must consider all of the elements that contribute to making appropriate nursing diagnoses.

When caring for the perioperative patient, you make clinical care decisions by integrating knowledge of anatomy, physiology, pathophysiology, and the surgical stress response with previous experiences in caring for surgical patients and information gathered from the patient, such as medical and surgical history, potential for surgical risk, and coping resources. Your use of critical thinking qualities such as perseverance is needed to develop a plan of care that provides successful perioperative

► **TABLE 48-1** Classification of Surgical Procedures

Type	Description	Examples
Seriousness		
Major	Involves extensive reconstruction or alteration in body parts; poses great risks to well-being	Coronary artery bypass, colon resection, removal of larynx, resection of lung lobe
Minor	Involves minimal alteration in body parts; often designed to correct deformities; involves minimal risks compared with major procedures	Cataract extraction, facial plastic surgery, tooth extraction
Urgency		
Elective	Is performed on basis of patient's choice; is not essential and may not be necessary for health	Bunionectomy, facial plastic surgery, hernia repair, breast reconstruction
Urgent	Is necessary for patient's health; may prevent additional problems from developing (e.g., tissue destruction or impaired organ function); not necessarily emergency	Excision of cancerous tumour, removal of gallbladder for stones, vascular repair for obstructed artery (e.g., coronary artery bypass)
Emergency	Must be done immediately to save life or preserve function of body part	Repair of perforated appendix, repair of traumatic amputation, control of internal hemorrhaging
Purpose		
Diagnostic	Surgical exploration that allows physician to confirm diagnosis; may involve removal of tissue for further diagnostic testing	Exploratory laparotomy (incision into peritoneal cavity to inspect abdominal organs), breast mass biopsy
Ablative	Excision or removal of diseased body part	Amputation, removal of appendix, cholecystectomy
Palliative	Relieves or reduces intensity of disease symptoms; will not produce cure	Colostomy, debridement of necrotic tissue, resection of nerve roots
Reconstructive or restorative	Restores function or appearance to traumatized or malfunctioning tissues	Internal fixation of fractures, scar revision
Procurement for transplant	Removal of organs, tissues, or both from a person pronounced brain dead for transplantation into another person	Kidney, heart, or liver transplant
Constructive	Restores function lost or reduced as result of congenital anomalies	Repair of cleft palate, closure of atrial septal defect in heart
Cosmetic	Performed to improve personal appearance	Blepharoplasty to correct eyelid deformities; rhinoplasty to reshape nose

► **TABLE 48-2** Physical Status (PS) Classification of the American Society of Anesthesiologists

Class	Description	Characteristics and Examples
PS-I	A normal, healthy patient	No physiological, biological, or organic disturbance
PS-II	A patient with a mild systemic disease	Disease imposes minimal restriction on activity; e.g., hypertension (HTN), obesity, diabetes mellitus
PS-III	A patient with a severe systemic disease that limits activity but is not incapacitating	Disease limits activity (e.g., severe diabetes with systemic complications); history of myocardial infarction, angina pectoris, or poorly controlled HTN
PS-IV	A patient with a severe systemic disease that is a constant threat to life	Severe cardiac, pulmonary, renal, hepatic, or endocrine dysfunction
PS-V	A moribund patient who is not expected to survive without the operation	Surgery is done as a last recourse or as a resuscitative effort; e.g., major multisystem or cerebral trauma, ruptured aneurysm, or large pulmonary embolus
PS-VI	A patient declared brain dead whose organs are being removed for donor purposes	

Note: The addition of an "E" to the physical status class indicates emergency surgery, such as PS-IE, PS-IIE, and so on.

Adapted from *Physical status (PS) classification*. (2008). Reprinted with permission of the American Society of Anesthesiologists (520 N. Northwest Highway, Park Ridge, IL, 60068-2573, <http://asahq.org/clinical/physicalstatus.htm>).

care (e.g., airway management, infection control, pain management, and discharge planning). Professional standards and guidelines developed by, for example, AORN, NAPANC, OPANA, and ORNAC, provide valuable information for perioperative management and evaluation of processes and outcomes. However, you also should review guidelines within the context of new and emerging evidence-informed practice and agency policies.

The Nursing Process in the Preoperative Surgical Phase

Surgical patients enter the health care setting in different stages of health. A patient may enter the hospital on a predetermined day feeling relatively healthy and prepared to face elective surgery. In contrast, a victim of a motor vehicle collision may face emergency surgery with no time to prepare. The ability to

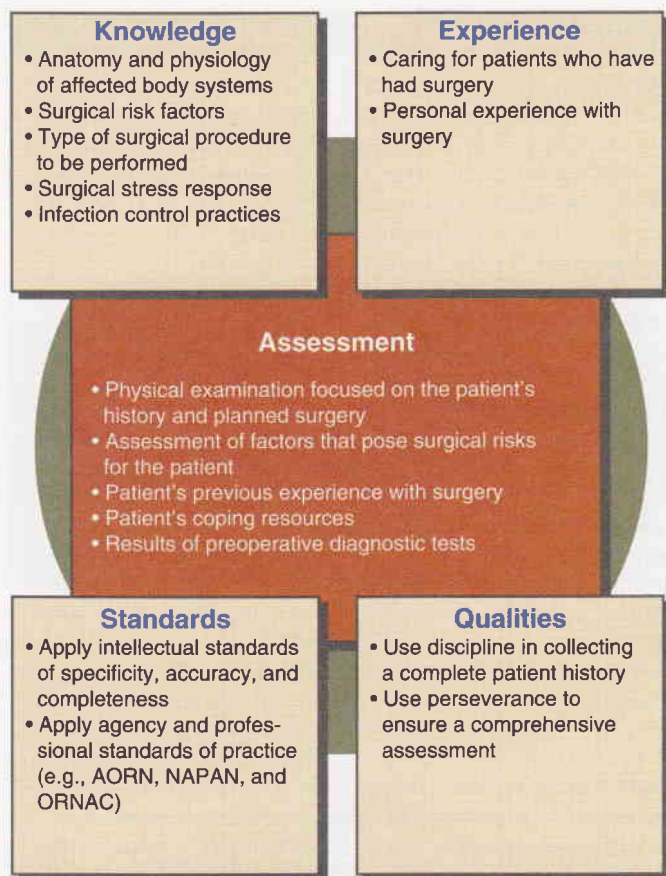


Figure 48-1 Critical thinking model for surgical patient assessment.

establish rapport and maintain a professional relationship with the patient is an essential component of the preoperative phase. You must do this quickly but compassionately and effectively.

The surgical patient may undergo tests and procedures to confirm or rule out problems requiring surgery. Most testing is performed before the day of surgery. Usually patients scheduled for same-day surgery have tests done several days before surgery. Testing done the day of surgery is usually limited to such tests as glucose monitoring for the patient with diabetes. You must be familiar with the tests, their purpose, and how to monitor results.

The patient meets many members of the interprofessional team, including surgeons, anesthesiologists, physiotherapists, and nurses. All play a role in the patient's care and recovery. Family members attempt to provide support through their presence but face many of the same stressors as the patient. You must communicate effectively with the patient and family because the nurse-patient relationship is the foundation of care (see Chapter 17). You should assess the patient's physical, emotional, and spiritual well-being and cultural heritage; recognize the degree of surgical risk; coordinate diagnostic tests; identify nursing diagnoses and nursing interventions; and establish outcomes in collaboration with the patient and his or her family. Pertinent data and the care plan are communicated among the members of the surgical team.

❖ Assessment

The assessment of the surgical patient is intended to establish the patient's baseline preoperative function to assist in preventing and recognizing possible postoperative complications. Assessment of the surgical patient can be extensive. Ambulatory surgical programs require that patient data be completed several days in advance. An interprofessional team approach is essential. Patients are admitted only hours before the surgical event; thus, you must organize and verify data obtained preoperatively to implement a perioperative care plan. This occurs not only with the ambulatory care patient, but also with the patient who will require a more prolonged hospital stay. Increasingly, patients are admitted on the day of surgery, even for such major procedures as open heart surgery and bowel surgery.

Most assessments begin in a preadmission clinic before admission for surgery. The purpose of the preadmission is to prepare the patient physically and emotionally for surgery (OPANA, 2009). Patients may answer a self-report inventory and you may complete an initial physical examination, draw blood or complete other laboratory tests, begin teaching, identify potential risks, and answer questions. This streamlines the care required for the patient on the day of surgery. In the immediate preoperative period, you assess the patient's understanding of previous teaching and individualize patient and family care.

The physician usually performs a comprehensive history and physical examination with follow-up by the preadmission nurse. In this case, you need to review assessments and testing already completed and to highlight significant information (e.g., the patient being on diuretics). You focus on key measurements for all body systems to ensure that no obvious problems are overlooked and that the patient has understood education previously provided. Even though the surgeon will screen the patient before scheduling surgery, preoperative assessment occasionally reveals an abnormality that delays or cancels surgery. For example, the patient may have a cough and low-grade fever on admission. This may indicate the onset of infection, and the surgeon will need to be notified immediately.

Nursing Health History

You should conduct an initial interview to collect a patient history similar to that described in Chapter 31. If a patient is unable to relate all the necessary information, you should rely on family members as resources.

Medical History

A review of the patient's medical history should include past illnesses and the primary reason for currently seeking medical care. The patient's current medical record and medical records from past hospitalizations are excellent sources of data.

Preexisting illnesses can influence the choice of anesthetic agents used and the patient's ability to tolerate surgery and reach full recovery (Table 48-3). Candidates for same-day surgery must be carefully screened for medical conditions that may increase the risk for complications during or after surgery. For example, a patient who has a history of heart failure may experience a further decline in cardiac function both intraoperatively and postoperatively. Intravenous (IV) fluids may need to be administered at a slower rate, or a diuretic may need to be given if blood transfusions are required.

► **TABLE 48-3** Medical Conditions That Increase Risks of Surgery

Type of Condition	Reason for Risk
Bleeding disorders (thrombocytopenia, hemophilia) Diabetes mellitus	Increase risk of hemorrhaging during and after surgery. Increases susceptibility to infection and may impair wound healing due to altered glucose metabolism and associated circulatory impairment. Stress of surgery may cause increases in blood glucose levels.
Heart disease (recent myocardial infarction, dysrhythmias, congestive heart failure) and peripheral vascular disease Obstructive sleep apnea	Stress of surgery causes increased demands on myocardium to maintain cardiac output. General anaesthetic agents depress cardiac function. Administration of opioids increases risk of airway obstruction postoperatively. Patients will desaturate as revealed by drop in oxygen saturation by pulse oximetry.
Upper respiratory infection	Increases risk of respiratory complications during anaesthesia (e.g., pneumonia and spasm of laryngeal muscles).
Liver disease	Alters metabolism and elimination of drugs administered during surgery and impairs wound healing and clotting time because of alterations in protein metabolism.
Fever	Predisposes patient to fluid and electrolyte imbalances and may indicate underlying infection.
Chronic respiratory disease (emphysema, bronchitis, asthma)	Reduces patient's means to compensate for acid-base alterations (see Chapter 39). Anaesthetic agents reduce respiratory function, increasing risk for severe hypoventilation.
Immunological disorders (leukemia, acquired immune deficiency syndrome [AIDS], bone marrow depression, and use of chemotherapeutic drugs or immunosuppressive agents) Abuse of street drugs	Increase risk of infection and delayed wound healing after surgery. Patients who abuse drugs may have underlying disease (HIV, hepatitis), which can affect response to anaesthesia and surgery and the healing process.
Chronic pain	Regular use of pain medications may result in higher tolerance, a reduced effect from repeated doses of the same analgesic class (Ferrell & Coyle, 2001). Increased doses of analgesics may be required to achieve postoperative pain control.

Risk Factors

Various conditions and factors increase a person's risk when undergoing surgery. Knowledge of risk factors enables you to take necessary precautions in planning care.

Age. Very young patients are at risk during surgery because of their immature physiological status. During surgery, nurses and physicians are especially concerned with maintaining an infant's normal body temperature. The infant's shivering reflex is underdeveloped, and often wide temperature variations occur. Anaesthesia adds to the risk because anaesthetics can cause vasodilation and heat loss.

During surgery, an infant has difficulty maintaining a normal circulatory blood volume. The total blood volume of an infant is considerably less than that of an older child or an adult. Therefore, even a small amount of blood loss can be serious. A reduced circulatory volume makes it difficult for the infant to respond to increased oxygen demands during surgery. In addition, the infant is highly susceptible to complications associated with dehydration. However, if blood or fluids are replaced too quickly, overhydration may occur. Other important and unique aspects of a child's surgical care are airway management, treatment of seizures, management of temperature alterations, identification and treatment of emergence delirium and delayed emergence from anaesthesia, treatment of pain and agitation, and availability of age-appropriate emergency equipment and medications.

Older patients are also at risk for complications. With advancing age, a patient's physical capacity to adapt to the stress of surgery is hampered because of a decline in certain

body functions such as renal and liver. Despite the risk, the majority of patients undergoing surgery are older adults. Table 48-4 summarizes the physiological factors that place older patients at risk during surgery.

Nutrition. Normal tissue repair and resistance to infection depend on adequate nutrients. Surgery intensifies this need. After surgery, a patient requires at least 1500 kcal/day to maintain energy reserves. Increased protein, vitamins A and C, and zinc facilitate wound healing (see Chapters 42 and 46). A malnourished patient is prone to poor tolerance of anaesthesia, negative nitrogen balance, delayed blood clotting mechanisms, infection, poor wound healing, and the potential for multiple organ failure. If a patient is having elective surgery, attempts to correct nutritional imbalances should be made before the surgery. However, if a malnourished patient must undergo an emergency procedure, efforts to restore nutrients will occur after surgery.

Obesity. Obesity increases surgical risk by reducing respiratory and cardiac functions. Hypertension, coronary artery disease, diabetes mellitus, and heart failure are common in the bariatric (obese) population. Embolus, atelectasis (partial or total collapse of the alveoli), and pneumonia are also more frequent postoperative complications in the obese patient. The patient may have difficulty resuming normal physical activity after surgery. The obese patient is susceptible to poor wound healing and wound infection because of the structure of fatty tissue, which contains a poor blood supply. This slows delivery of essential nutrients, antibodies, and enzymes needed for wound healing (see Chapter 42). It is often

► **TABLE 48-4** Physiological Factors That Place the Older Adult at Risk During Surgery

Alterations	Risks	Nursing Implications
Cardiovascular System		
Degenerative change in myocardium and valves	Reduced cardiac reserve	Assess baseline vital signs. Recognize the longer time period required for heart rate to return to normal after stress on the heart and evaluate the occurrence of tachycardia accordingly (Eliopoulos, 2001).
Rigidity of arterial walls and reduction in sympathetic and parasympathetic innervation to heart	Alterations predispose patient to postoperative hemorrhage and rise in systolic and diastolic blood pressure	Maintain adequate fluid balance to minimize stress to the heart. Ensure that blood pressure level is adequate to meet circulatory demands.
Increase in calcium and cholesterol deposits within small arteries; thickened arterial walls	Predispose patient to clot formation in lower extremities	Instruct patient on techniques for performing leg exercises and proper turning. Apply elastic stockings, sequential compression devices.
Integumentary System		
Decreased subcutaneous tissue and increased fragility of skin	Prone to pressure ulcers and skin tears	Assess skin at least every four hours; pad all bony prominences during surgery. Turn or reposition at least every two hours (see Chapter 46).
Pulmonary System		
Stiffening and reduction in size of the rib cage	Reduced vital capacity	Instruct patient on proper technique for coughing and deep breathing.
Reduced range of movement in diaphragm	Residual capacity (volume of air left in lung after normal breath) increases, reducing amount of new air brought into lungs with each inspiration	When possible, have patient ambulate and sit in chair frequently.
Stiffened lung tissue and enlarged air spaces	Alteration reduces blood oxygenation	Obtain baseline oxygen saturation; measure as indicated throughout perioperative period.
Renal System		
Reduced blood flow to kidneys	Increased risk of shock when blood loss occurs	For patients hospitalized before surgery, determine baseline urinary output for 24 hours.
Reduced glomerular filtration rate and excretory times	Limits ability to eliminate drugs or toxic substances	Assess for adverse response to drugs.
Reduced bladder capacity	Voiding frequency increases, and larger amount of urine stays in bladder after voiding. Sensation of need to void may not occur until bladder is filled.	Instruct patient to notify nurse immediately when sensation of bladder fullness develops. Keep call light and bedpan within easy reach. Toilet every two hours, or more frequently if indicated.
Neurological System		
Sensory losses, including reduced tactile sense	Decreased ability to respond to early warning signs of surgical complications	Inspect bony prominences for signs of pressure that patient may not sense. Orient patient to surrounding environment. Observe for nonverbal signs of pain.
Decreased reaction time	Confusion after anaesthesia. Delirium postoperatively is an acute confusional state with rapid onset, disturbance in consciousness, and change in cognition (Hogan et al., 2006). Delirium can be caused by medications such as narcotics, or by physiological reasons such as infection or dehydration.	Allow adequate time to respond, process information, and perform tasks. Institute Best Practice Guidelines (BPGs) on screening for and on caregiving strategies for older adults with delirium, dementia, and depression (Registered Nurses' Association of Ontario [RNAO], 2004a, 2004b). Institute fall precautions (RNAO, 2002b).
Metabolic System		
Lower basal metabolic rate	Reduced total oxygen consumption	Ensure adequate nutritional intake when diet is resumed, but avoid intake of excess calories.
Reduced number of red blood cells and hemoglobin levels	Ability to carry adequate oxygen to tissues is reduced	Administer blood products if required. Monitor blood test results.

Continued

► **TABLE 48-4** Physiological Factors That Place the Older Adult at Risk During Surgery—cont'd

Alterations	Risks	Nursing Implications
Change in total amounts of body potassium and water volume	Greater risk for fluid or electrolyte imbalance occurs	Monitor electrolyte levels and supplement as necessary.
Impaired thermoregulatory mechanisms	Cold operating rooms; exposure of body parts during procedure, IV fluids, medications	Ensure careful, close monitoring of patient temperature; provide warm blankets; monitor cardiac function; warm IV fluids.

difficult to close the surgical wound of an obese patient because of the thick adipose layer. An obese patient is also at risk for **dehiscence** (opening of the suture line).

Immunocompetence. For the patient with cancer, radiation therapy may be given preoperatively to reduce the size of the cancerous tumour so that it can be removed surgically. Radiation has some unavoidable effects on normal tissue, such as excess thinning of skin layers, destruction of collagen, and impaired vascularization of tissue. Ideally, the surgeon waits four to six weeks after completion of radiation treatments to perform surgery. Otherwise, the patient may face serious problems with wound healing. In addition, chemotherapeutic drugs used for cancer treatment, immunosuppressive medications used to prevent rejection after organ transplantation, and steroids used to treat a variety of inflammatory conditions increase the risk for infection.

Fluid and Electrolyte Imbalances. The body responds to surgery as if it is a form of trauma. As a result of the adrenocortical stress response, sodium and water are retained and potassium is lost within the first two to five days after surgery. The severity of the stress response influences the degree of fluid and electrolyte imbalances. The more extensive the surgery, the greater is the stress response. A patient who is hypovolemic or who has serious preoperative electrolyte alterations is at significant risk during and after surgery. For example, an excess or depletion of potassium increases the chance of dysrhythmia during or after surgery. If the patient has preexisting renal, gastrointestinal, or cardiovascular abnormalities, the risk for fluid and electrolyte alterations is even greater.

Pregnancy. The perioperative care plan must address the needs of both the mother and the developing fetus. Surgery is performed on a pregnant patient only on an emergency basis. All the mother's major systems are affected during pregnancy. For example, cardiac output significantly increases, as does respiratory tidal volume to accommodate the increase in metabolic rate. Gastrointestinal motility decreases, hormone levels increase, and energy levels decrease with advancing pregnancy. Laboratory and hemodynamic values change. Fibrinogen levels increase, making pregnant patients more susceptible to the development of deep vein thrombosis because of increased coagulability. Hemoglobin and hematocrit levels decrease, mostly as a result of the effects of hemodilution (increased circulating volume). The white blood cell (WBC) count is elevated when the woman is near term and postpartum without the presence of infection. However, infection always must be ruled out in the presence of an elevated WBC count. General anaesthesia is administered with caution because of the increased risk for fetal death and preterm labour. Psychological considerations for mother and family are essential.

Previous Surgeries

Although previous surgery does not necessarily present as a risk factor, a patient's past experience with surgery can highlight many potential issues. You should ask the patient to recall the previous type of surgery, level of discomfort, extent of disability, and overall level of care provided. Address any complications that the patient experienced. It is also important to assess patients for motion sickness, nausea, and vomiting with previous surgeries (Gan, 2002; Tramer, 2001). These factors increase the risk for aspiration. Prior anaesthesia records may be a useful source of information if previous problems such as malignant hyperthermia occurred. This information helps you to anticipate the patient's preoperative and postoperative needs.

Previous surgery also may influence the level of physical care required after a surgical procedure. For example, a patient who has had a previous thoracotomy for resection of a lung lobe has a greater risk for postoperative pulmonary complications than does a patient with intact, normal lungs.

Perceptions and Understanding of Surgery

The surgical experience affects not only the patient, but also the entire family. You therefore must prepare both the patient and the family for the surgical experience. Identifying a patient's and family's knowledge, expectations, and perceptions allows you to plan teaching and to provide individualized emotional support measures.

Each patient feels fearful when entering the surgical setting. Some fears are due to past hospital experiences, warnings received from friends and family, or lack of knowledge. You must assess the patient's understanding of the planned surgery and its implications. For example, you need to determine whether the patient recognizes that she will have a breast biopsy performed, not a mastectomy. You might ask questions such as "Tell me what you think will happen before and after surgery," or "Explain what you know about your surgery." If a patient is misinformed or unaware of the reason for surgery, you must confer with the physician before the patient is sent to the surgical suite. You also determine whether further explanations are needed related to routine preoperative and postoperative procedures. When a patient is well prepared and knows what to expect, you reinforce the patient's knowledge and maintain accuracy and consistency.

Medication History

If a patient regularly uses prescription or over-the-counter medications, the surgeon or anaesthesiologist may temporarily discontinue the drugs before surgery or adjust the dosages. Certain medications have special implications for the surgical patient, creating greater risks for complications or interacting negatively with anaesthetic agents (Table 48-5). For example,

TABLE 48-5 Medications With Special Implications for the Surgical Patient

Drug Class	Effects During Surgery
Antibiotics	Antibiotics can potentiate action of anaesthetic agents. For example, if taken within two weeks before surgery, aminoglycosides (gentamicin, tobramycin, neomycin) may cause mild respiratory depression due to depressed neuromuscular transmission.
Antidysrhythmics	Antidysrhythmics can reduce cardiac contractility and impair cardiac conduction during anaesthesia.
Anticoagulants	Anticoagulants alter normal clotting factors and thus increase risk of hemorrhaging. They should be discontinued before surgery. Aspirin (ASA) is a commonly used medication that can alter clotting mechanisms. Many older patients take ASA, and the nurse should be alert as to whether they have discontinued this presurgery. Most surgeons will have the patient stop taking ASA four to five days previous to the surgery.
Anticonvulsants	Long-term use of certain anticonvulsants (e.g., phenytoin [Dilantin] and phenobarbital) can alter the metabolism of anaesthetic agents.
Antihypertensives	Antihypertensives may interact with anaesthetic agents to cause bradycardia, hypotension, and impaired circulation. Some may inhibit synthesis and storage of norepinephrine in sympathetic nerve endings.
Corticosteroids	With prolonged use, corticosteroids cause adrenal atrophy, which reduces the body's ability to withstand stress. Before and during surgery, dosages may be temporarily increased.
Insulin	Diabetic patients' need for insulin after surgery is altered. Stress response and IV administration of glucose solutions can increase dosage requirements after surgery. Decreased nutritional intake can decrease dosage requirements.
Diuretics	Diuretics potentiate electrolyte imbalances (particularly potassium) after surgery.
Nonsteroidal anti-inflammatory drugs (NSAIDs)	NSAIDs inhibit platelet aggregation and may prolong bleeding time, increasing susceptibility to postoperative bleeding.
Herbal therapies: ginger, ginkgo, ginseng	Some herbal therapies have the ability to affect platelet activity and increase susceptibility to postoperative bleeding. Ginseng may increase hypoglycemia with insulin therapy.

you instruct patients in a preadmission unit to ask the physician whether usual medications should be taken on the morning of surgery. Patients also should be asked whether any herbal preparations are used, because many patients do not view herbs as medications and may omit them from their medication history (see Chapter 34). Certain herbs may interfere with the action of other medications (a pharmacist must be consulted). In the preadmission clinic, you determine whether the patient is taking any herbal medications. For hospitalized patients, prescription drugs taken preoperatively are automatically discontinued postoperatively unless the physician reorders them. It is important for you to be aware of the patient's previous medications that likely will need to be resumed postoperatively (e.g., antihypertensives).

Allergies

You must assess for allergies to drugs that may be given during a phase of the surgical experience. In addition, it is critical to assess for latex, food, and contact allergies (e.g., allergies to tape, ointments, or solutions). A patient may be too young or have too few exposures to drugs to know whether he or she has any allergies. The type of allergic response is also very important to assess. Allergies need to be delineated from unpleasant side effects. For example, the patient may state that codeine causes nausea (a side effect), or that it causes hypotension and confusion (an allergy). When asking a patient about allergies, realize that the term *allergy* can be confusing for some patients. Asking a patient whether he or she has ever "had a problem with a medication or substance" may be another helpful approach to questioning.

It is critical that the patient be asked specifically about latex allergies because a latex-free environment must be provided for patients with latex allergies. You ensure that a list of the patient's allergies is noted appropriately in his or her chart, the hospital computer system, or both, as well as in any

other places designated by institutional policy, such as an allergy band.

Smoking Habits

The patient who smokes is at greater risk for postoperative pulmonary complications than one who does not. The chronic smoker already has an increased amount and thickness of mucous secretions in the lungs. General anaesthetics increase airway irritation and stimulate pulmonary secretions, which are retained as a result of reduction in ciliary activity during anaesthesia. After surgery, the patient who smokes has greater difficulty clearing the airways of mucous secretions and needs education on the importance of postoperative deep breathing and coughing (see Chapter 38). In addition, smoking can compromise blood flow to the heart, which can affect the response to surgery. Nurses play a key role in reducing smoking, and there are nursing Best Practice Guidelines (BPGs) on smoking cessation (RNAO, 2007). During the postoperative period, nicotine replacement therapy may be required to support the patient who smokes.

Alcohol Ingestion and Substance Use and Abuse

Habitual use of alcohol and illegal drugs predisposes the patient to adverse reactions to anaesthetic agents. The patient also may experience a cross-tolerance to anaesthetic agents, necessitating higher-than-normal amounts. In addition, the physician may need to increase postoperative dosages of analgesics. Patients with a history of excessive alcohol ingestion also may be malnourished, which may contribute to delayed wound healing. These patients are also at risk for liver disease, portal hypertension, and esophageal varices (predisposing the patient to bleeding disorders). The patient who habitually uses alcohol and is required to remain in the hospital for longer than 24 hours is also at risk for acute alcohol withdrawal and its more severe form, delirium tremens.

Family Support

It is important for you to determine the extent of the patient's support from family members or friends. Because blood relations do not always define family, it is best to have the patient identify his or her sources of support (see Chapter 19). Surgery often results in temporary or permanent disability that requires added assistance during recovery. The patient usually cannot immediately assume the same level of physical activity enjoyed before surgery. Often a patient returns home with dressings to change or exercises to perform. With same-day surgery, patients and families assume responsibility for postoperative care. The family is an important resource for the patient with physical limitations and provides the emotional support needed to motivate the patient to return to a previous state of health. In addition, the family may better remember preoperative and postoperative teaching.

You should ask whether family members or friends could provide support. The patient may want someone else present when you provide instructions or explanations. Family presence should be encouraged when feasible, especially for patients having ambulatory surgery. Often a family member can become the patient's coach, offering valuable support during the postoperative period, when the patient's participation in care is vital.

Occupation

Surgery may result in physical alterations that hinder or prevent a person from returning to work. You should assess the patient's occupational history to anticipate the possible effects of surgery on recovery and eventual work performance. Explain any restrictions before a patient returns to work, such as lifting, use of the extremities, or climbing stairs. When a patient is unable to return to his or her job, you should confer with a social worker or occupational therapist to refer the patient to job-training programs or to help the patient seek economic assistance.

Preoperative Preparation for Pain Assessment and Management

Surgical manipulation of tissues, treatments, and positioning on the OR table may result in postoperative pain for the patient. Pain is a very personal experience and requires an individualized care plan. Preoperatively, you should prepare the patient and family for the assessment and management of pain (see Chapter 41), including the patient's and the family's expectations for pain management after surgery. You should begin education regarding pain management as soon as possible (Barnes, 2001). The preoperative assessment should introduce to the patient the use of a pain instrument to rate the presence and severity of pain postoperatively (see Chapter 41). Several instruments for both pediatric and adult patients have shown reliability and validity (Summers, 2001). Frequent pain assessments with the patient are necessary to alert you to treat the pain and assess the adequacy (outcome) of pain interventions.

Review of Emotional Health

Surgery is psychologically stressful. The patient may be anxious about the surgery and its implications. Patients often feel that they are powerless over their situation. Family members may perceive the patient's surgery as a disruption of their lifestyle. Hospitalization and the recovery period at home may be lengthy. The family is usually concerned about the

patient returning to a normal, productive life. When the patient has chronic illness, the family may be fearful that surgery will result in further disability or may be hopeful that it will improve their lifestyle. To understand the impact of surgery on a patient's and a family's emotional health, you should assess the patient's feelings about surgery, self-concept, body image, and coping resources.

It is often difficult to assess feelings thoroughly when ambulatory surgery is scheduled. You usually have less time to establish a relationship with the patient. Box 48-1 describes a study that explored the needs of ambulatory surgery patients. In some day surgical programs, you may visit with a patient in the home or on the telephone before surgery. In a hospital room, you should choose a time for discussion after admitting procedures or diagnostic tests have been completed. Explain to the patient that it is normal to have fears and concerns. The patient's ability to share feelings partially depends on your willingness to listen, be supportive, and clarify misconceptions.

If the patient feels powerless, you should attempt to determine the reason. The medical diagnosis may generate apprehension of increased dependence and loss of physical or mental function. The thought of being "put to sleep" under anaesthesia may create concern about loss of control. Most patients want to retain the power to make decisions about treatment. You must assure patients of their right to ask questions and seek information.

A patient may be angry about the need for surgery. For example, a young person may feel that it is unfair to have a disorder that typically affects older people. Surgery may occur at a time when it is inconvenient or potentially disruptive. The patient occasionally may express anger verbally at you or the physician. Being argumentative or overly demanding, refusing to cooperate, and criticizing your efforts to provide care are manifestations of the patient's anger and anxiety.

Body Image. Surgical removal of any diseased body part may leave permanent disfigurement or alteration in body function. Loss of certain body functions (e.g., with a colostomy or ureterostomy) may compound patients' fears. You should assess for the body-image alterations that patients perceive will result from surgery. Patients will respond differently depending on their culture, self-concept, and degree of self-esteem (see Chapter 25).

Often, surgery changes the physical or psychological aspects of patients' sexuality. Excision of breast tissue, colostomy, ureterostomy, hysterectomy, or removal of the prostate gland may affect the patients' perceptions of their sexuality. Some surgeries (e.g., hernia repairs) require the patient to refrain from sexual intercourse temporarily, until the return to normal physical activity.

You should encourage patients to express their concerns about sexuality. The patient facing even temporary sexual dysfunction requires understanding and support. Discussions about the patient's sexuality should be held with the patient's sexual partner so that both individuals can gain a shared understanding of how to cope with limitations in sexual function.

Coping Resources. Assessment of feelings and self-concept helps to reveal whether the patient can cope with the stress of surgery. The physiological effects of stress are well documented. Activation of the endocrine system results in the release of hormones and catecholamines (epinephrine, norepinephrine), which results in increases in blood pressure, heart rate, and respiration. Platelet aggregation also occurs, along

* BOX 48-1 RESEARCH HIGHLIGHT

Pain Management Following Discharge After Ambulatory Same-Day Surgery

Research Focus

Same-day surgeries are now commonplace for many procedures. What is not well known is how patients manage their pain once home following same-day surgery.

Research Abstract

The purpose of the study by Watt-Watson et al. (2004) was to examine the perspectives of patients who had undergone same-day surgery. The focus of the telephone interview with 180 patients was to determine the level of their pain, how much their pain interferes with usual activities, analgesics used, adverse events, complications and resources utilized, and the adequacy of post-discharge information given. Four periods were examined: 24, 48, and 72 hours post-discharge and then 7 days after discharge.

The sample of 180 patients was made up of those who had undergone laparoscopic cholecystectomy (54), hand surgery (78), and shoulder surgery (48). The average age of the patients was 42 years (youngest was 27 and oldest was 57). Patients requiring hand surgery received regional anaesthesia, while those receiving laparoscopic cholecystectomy had a general anaesthesia. Those patients undergoing shoulder surgery had a general anaesthesia with some having a postoperative block for pain. Statistical analysis was conducted to determine differences in pain, interference, and analgesic use by surgical group and time since surgery. An alpha level of significance of 0.05 was used for the analysis. The results revealed that pain decreased more quickly for patients with hand surgery and laparoscopic cholecystectomy, particularly at the 72 hours and 7 day time frame. However, at day 7, the "worst 24-hour pain" was reported as severe by 31% (7) of patients with hand surgery, 55% with shoulder surgery, and 8% with laparoscopic cholecystectomy. In addition, patients with shoulder surgery had significantly more pain and pain-related interference with sleep and work from 24 hours after surgery until day 7. The main analgesic taken was acetaminophen with codeine 30 mg. Fifty percent of the sample took no analgesics after 72 hours postoperative. About 20% of patients experienced adverse effects, mainly constipation and nausea from the analgesics. Less than 6% of the sample tried nonpharmacological approaches for their pain. Complications cited by the patients were bleeding (4%) and sore throat (11%). The physician was called by 4% of the sample. Most patients (69%) reported that they did receive adequate information to take care of themselves after surgery. However, 23% of the patients receiving shoulder surgery did not believe they had received enough information. Seventy-three percent were prepared enough to manage their pain at home while 55% felt instructions were clear about taking medications. However, 56% of the sample indicated that they did not receive instructions regarding what to do if the analgesics were ineffective or if they caused side effects.

The authors concluded that despite the pain reported by the patients, analgesic use and other interventions were minimal. Further research into pain interventions and related education for day-surgery patients after discharge is warranted.

Reference: Watt-Watson, J., Chung, F., Chan, V. W. S., & McGillion, M. (2004). Pain management following discharge after ambulatory same day surgery. *Journal of Nursing Management*, 12, 153–161.



with many other physiological responses. You must be aware of these responses and assist with stress management (see Chapter 29). Ask the patient about past stress management. If the patient has had previous surgery, you should determine what behaviours helped to resolve any tension or nervousness. You may instruct the patient on relaxation exercises that can help control anxiety.

When reviewing the patient's coping resources, ask him or her about specific family members and friends who may provide support. Once they are identified, you should include these individuals in any patient teaching and interventions aimed at managing stress and anxiety.

Culture

Culture is a patterned behavioural response that has developed over time through social and religious structures, as well as intellectual and artistic manifestations (Giger & Davidhizar, 1999). Patients come from diverse cultural and religious backgrounds that affect the way they perceive and react to their surgical experience. If cultural, ethnic, and religious differences are not acknowledged and incorporated into the perioperative care plan, desired surgical outcomes may not be achieved. Therefore, learning about a patient's cultural and ethnic heritage helps you provide effective perioperative care. Although it is important to recognize and plan for differences based on culture, you also must recognize that members of the same culture are individuals and may not hold these shared beliefs. Box 48-2 highlights cultural care aspects in the perioperative period.

* BOX 48-2 CULTURAL ASPECTS OF CARE

Providing individualized education and perioperative nursing care to patients of various cultural, religious, and ethnic groups can be challenging. Using a variety of resources available within a health care agency, both in the literature and from the Internet, will help you to provide culturally sensitive care.



Implications for Practice

- Preoperative assessment should include a cultural assessment with questions such as primary language spoken, feelings regarding surgery and pain, pain management, expectations, support system, and feelings toward self-care with postoperative implications (e.g., Does patient relate to concept of pain? Does patient follow custom that gives family members control over decisions?).
- Use a professional interpreter to communicate with a patient whose language is different than yours.
- Use pictures or phrase cards with various languages to communicate with a patient whose language is different than yours; these cards can be used to assess pain, comfort, temperature, and so forth. For example, Davidhizar and Giger (2004) suggest strategies for culturally appropriate assessment and management of pain such as understanding that the meaning of pain varies between cultures.
- Provide preoperative and postoperative educational materials in a variety of languages.

Source: Adapted from De Ruiter, H. P., & Larsen, K. E. (2002). Developing a transcultural patient care Web site. *Journal of Transcultural Nursing*, 13(1), 61–70; and Douglas, M. (1999). Pain as the fifth vital sign: Will cultural variations be considered? *Journal of Transcultural Nursing*, 10, 285.

Patient Expectations

Patients rely on their caregivers for information, comfort, pain control, adequate monitoring, and performance of interventions that ensure their safety throughout the surgical experience. This requires you to have a caring attitude, advocate for the patient, be skilled in surgical assessment and interventions, and anticipate the patient's needs throughout the perioperative period. You must understand the patient's expectations in order to develop an individualized care plan. Does the patient expect full pain relief or simply to have pain reduced? Does the patient expect to be independent immediately after surgery, or does he or she expect to be fully dependent on you or on family members? These are only a few of the questions that need to be asked of the surgical patient to establish a care plan congruent with his or her needs and expectations.

Physical Examination

You should conduct a partial or complete physical examination, depending on the patient's preoperative condition (see Chapter 31). Assessment focuses on findings related to the patient's medical history and on body systems that likely will be affected by the surgery. The nursing assessment should complement the surgeon's and anaesthesiologist's physical examination (Barnes, 2002).

General Survey. You should observe the patient's general appearance. Gestures and body movements may reflect weakness caused by illness. The patient may appear malnourished. Height, body weight, and history of recent weight loss are important indicators of nutritional status.

Preoperative vital signs, including blood pressure while sitting and standing, provide important baseline data with which alterations that occur during and after surgery can be compared. Some institutions request that blood pressure be obtained in both arms for comparison. Anxiety and fear commonly cause elevations in heart rate and blood pressure. As the effects of the anaesthesia diminish after surgery, compare vital sign findings with the preoperative baseline. Preoperative assessment of vital signs is also important to rule out fluid and electrolyte abnormalities (see Chapter 30).

An elevated temperature before surgery is a cause for concern. If the patient has an underlying infection, the surgeon may choose to postpone surgery until the infection has been treated. An elevated body temperature increases the risk for fluid and electrolyte imbalances after surgery.

Head and Neck. The condition of oral mucous membranes is one indicator of the patient's level of hydration. A dehydrated patient is at risk for developing serious fluid and electrolyte imbalances during surgery. Inspection of the soft palate and nasal sinuses can reveal sinus drainage, indicative of respiratory or sinus infection. Cervical lymph node enlargement may reveal local or systemic infection.

You should inspect the jugular veins for distension. Excess fluid within the circulatory system or failure of the heart to contract efficiently may lead to jugular vein distension and reveal a risk for cardiovascular complications during surgery.

During the examination of the oral mucosa, loose or capped teeth must be identified because they could become dislodged during endotracheal intubation. Dentures must be noted so that they can be removed before surgery, especially if general anaesthesia is required.

Integument. You should carefully inspect the skin, especially over bony prominences, such as the heels, elbows,

sacrum, and scapula. During surgery, a patient must lie in a fixed position, often for several hours. As a result, the patient may have an increased risk for pressure ulcers (see Chapter 46), especially if the skin is thin and dry and has poor turgor (Schoonhoven et al., 2002). Chronic use of steroids also increases the patient's susceptibility to skin tears. In addition, the overall condition of the skin reveals the patient's level of hydration. An older adult is at high risk for alteration in skin integrity from positioning on the OR table, causing pressure.

Thorax and Lungs. Assessment of the patient's breathing pattern and chest excursion aids in assessing ventilatory capacity. A decline in ventilatory function places the patient at risk for respiratory complications. For example, a patient who has high abdominal surgery will have difficulty breathing deeply because of a painful abdominal incision. Auscultation of breath sounds will indicate whether the patient has pulmonary congestion or narrowing of airways.

Existing atelectasis or moisture in the airways will be aggravated during surgery. Serious pulmonary congestion may cause postponement of the surgery. Certain anaesthetics can cause laryngeal muscle spasm; thus, if you auscultate wheezing in the airways preoperatively, the patient is at risk for further airway narrowing during surgery and after extubation (removal of the endotracheal tube); therefore, the physician should be made aware of these findings.

Heart and Vascular System. You should assess the character of the apical, radial, and peripheral pulses; the capillary refill; and the colour and temperature of the patient's extremities. If peripheral pulses are not palpable, a Doppler instrument should be used to assess their presence. Acceptable capillary refill occurs in less than three seconds. Measurement of capillary refill and assessment of peripheral pulses are particularly important for the patient having vascular surgery or orthopedic surgery (see Chapter 31).

Abdomen. You should assess the abdomen for size, shape, symmetry, and presence of distension. Assessment of preoperative bowel sounds is useful as a baseline. You also should ask whether the patient has regular bowel movements and inquire about the colour and consistency of stools.

Neurological Status. Preoperative assessment of neurological status is imperative for all patients who will be receiving general anaesthesia. The baseline neurological status assists with the assessment of ascent from anaesthesia. During the health history and physical assessment, observe the patient's level of orientation, alertness, and mood, noting whether the patient answers questions appropriately and can recall recent and past events. A patient who will have surgery for neurological disease (e.g., brain tumour or aneurysm) may demonstrate an impaired level of consciousness or altered behaviour.

If the patient is scheduled for spinal anaesthesia, preoperative assessment of gross motor function and strength is important. Spinal anaesthesia causes temporary paralysis of the lower extremities. You should be aware if a patient enters surgery with weakness or impaired mobility of the lower extremities so that, when the spinal anaesthetic wears off, you will not expect full motor function to return.

Diagnostic Screening

Before a patient has surgery, the surgeon may order diagnostic tests as determined by the patient's history and physical assessment. Table 48-6 lists common diagnostic tests performed preoperatively based on the patient's medical history.

The tests ordered are also determined by the procedure itself. For procedures where blood loss is expected (e.g., hip and knee replacements), a type and cross-match would be indicated preoperatively. The surgeon will designate the number of blood units to have available during surgery. Table 48-7 outlines the purpose and normal values for the more common blood tests. If diagnostic tests reveal severe problems, the surgeon may cancel surgery until the condition stabilizes. You are responsible for the preparation of patients for diagnostic studies and for coordinating completion of the tests. You also review diagnostic results as they become available, not only to alert physicians to these findings and to assist with planning appropriate therapy, but also to integrate these findings into your decisions related to patient care.

If a patient is over age 65 or has heart disease, an electrocardiogram (ECG) is usually mandatory. The ECG measures the electrical activity of the heart to assess the heart rate, rhythm, and other factors. A chest X-ray (an examination of the condition of the heart and lungs) is required for thoracic surgery or if the patient has certain medical conditions.

Pulmonary function testing and arterial blood gas analysis may be performed on patients with preexisting lung disease.

► TABLE 48-6

Common Diagnostic Tests Performed Preoperatively Based on Patient History

History	Tests
Hepatic disease	International normalized ratio (INR); partial thromboplastin time (PTT); liver enzymes, such as serum aspartate aminotransferase; alkaline phosphatase
Cardiovascular disease	blood urea nitrogen (BUN), creatinine, complete blood count (CBC), chest X-ray, electrocardiogram (ECG)
Pulmonary disease	CBC, chest X-ray, ECG
Central nervous system disease	White blood cell (WBC) count, electrolytes, BUN, creatinine, glucose, and electroencephalography (EEG)
Medications	
Diuretics	Electrolytes, and perhaps BUN and creatinine
Steroids	Electrolytes, glucose
Anticoagulants	INR, PTT

► TABLE 48-7 Diagnostic Screening for Surgical Patients

Measurement and Normal Values

Complete Blood Count (CBC)

Red blood cells (RBCs): Men: $4.7\text{--}5.14 \times 10^{12}/\text{L}$; Women: $4.2\text{--}4.87 \times 10^{12}/\text{L}$

Hemoglobin (Hgb): Men: 132–173 g/L; Women: 117–155 g/L

Hematocrit (Hct): Men: 0.43–0.49; Women: 0.38–0.44

White blood cells (WBCs): Adults and children >2 years: $4.5\text{--}11 \times 10^9/\text{L}$

Serum Electrolytes

Sodium (Na): 136–145 mmol/L

Potassium (K): 3.5–5.0 mmol/L

Chloride (Cl): 98–106 mmol/L

Bicarbonate (HCO_3): 22–26 mmol/L

Coagulation Studies

International normalized ratio (INR): 0.76–1.27 Activated partial thromboplastin time (APTT): 30–40 seconds Platelets: $150\text{--}400 \times 10^9$

Serum Creatinine

Men: 53–106 mcml/L

Women: 44–97 mcml/L

Blood Urea Nitrogen (BUN)

2.9–7.5 mmol/L

Glucose

Fasting: 4.2–6.1 mmol/L

Interpretation

Peripheral venous sample of blood measures RBCs, WBCs, Hgb, and Hct. May reveal infection, low blood volume, and potential for oxygenation problems. Surgeon may order blood replacement.

Peripheral venous sample of blood reveals significant fluid and electrolyte imbalances preoperatively. Attention is given to Na, K, and Cl levels. Intravenous (IV) fluid replacement may be indicated preoperatively.

INR, APTT, and platelet counts reveal clotting ability of blood. Reveals patients at risk for bleeding tendencies and thrombus formation.

Ability of kidneys to excrete creatinine, a by-product of muscle metabolism, indicates renal function. Elevated level can indicate renal failure.

Ability of kidneys to excrete urea and nitrogen indicates renal function. BUN becomes elevated if patient is dehydrated. Preoperative IV fluid replacement may be needed.

Finger stick or peripheral blood sample. Patients may require treatment of low or high levels preoperatively and postoperatively. Elevated blood sugar results from a deficiency in insulin secretion (type 1 diabetes), insulin action, or combination of both (type 2 diabetes).

Blood glucose levels and perhaps glycated hemoglobin (HbA1c) are measured on patients with diabetes.

Autologous infusions are an option for some patients who choose to donate their own blood before surgery. Although Canadian Blood Services screens all blood donors and blood products for infections such as HIV and hepatitis, some patients are more comfortable donating their own blood. The donation usually must be made several weeks before the scheduled surgery. Because of the short time frame now from preadmission to day of surgery, autologous infusions are used less as there is usually not even time for the process to be completed. The patient who does self-donate may exhibit lower hemoglobin and hematocrit levels on the day of surgery. Autotransfusion via the use of a cell-saver device during surgery may be possible if physicians anticipate large blood loss (e.g., open heart surgery). The cell-saver device, although expensive, returns washed RBCs to the patient and has created positive outcomes with regard to length of patient stay (Rothrock, 2003).

❖ Nursing Diagnosis

You will cluster patterns of defining characteristics gathered during assessment to identify nursing diagnoses for the surgical patient (Box 48-3). The patient with preexisting health problems is likely to have a variety of risk diagnoses. For example, a patient with preexisting bronchitis who has abnormal breath sounds and a productive cough will be at risk for ineffective airway clearance. In addition, a patient who undergoes a surgical procedure is at risk for developing infection at the surgical site, the IV site, or the bloodstream (sepsis). A diagnosis of risk for infection will require your attention from admission through convalescence.

The related factors for each diagnosis establish directions for nursing care that will be provided during one or all of the surgical phases. For example, the diagnosis of risk for infection related to an invasive procedure will require different interventions than if the related factor were inadequate immune response. Preoperative nursing diagnoses allow the nurse to

take precautions and actions so that the care provided during the intraoperative and postoperative phases is consistent with the patient's needs.

Nursing diagnoses made preoperatively will also focus on the potential risks a patient may face after surgery. Preventive care is essential so that the surgical patient can be managed effectively. The following are common nursing diagnoses relevant to the surgical patient:

- *Ineffective airway clearance*
- *Risk for allergy response to latex*
- *Anxiety*
- *Disturbed body image*
- *Risk for ineffective thermoregulation*
- *Ineffective breathing pattern*
- *Ineffective coping*
- *Fear*
- *Risk for deficient fluid volume*
- *Risk for infection*
- *Risk for perioperative-positioning injury*
- *Deficient knowledge (specify)*
- *Impaired physical mobility*
- *Acute pain*
- *Powerlessness*
- *Impaired skin integrity*
- *Disturbed sleep pattern*
- *Delayed surgical recovery*

❖ Planning

During planning, you once again synthesize information from multiple resources (Figure 48-2). For example, knowledge pertaining to adult learning principles, coupled with the patient's unique needs, will ensure a well-designed **preoperative teaching plan**. Critical thinking ensures that the patient's care plan integrates your knowledge, previous experience, and established standards of care. Previous experience in caring for surgical patients helps you anticipate how to approach patient care (e.g., complications to prevent and anticipate, and methods to reduce anxiety). Professional standards are especially important to consider when you develop a care plan, as they often provide a scientific basis for selecting effective nursing interventions. You will develop an individualized care plan for each nursing diagnosis (Box 48-4). You and the patient will set realistic expectations for care.

Successful planning requires the involvement of both the surgical patient and the family in establishing the care plan. Early patient involvement minimizes surgical risks and postoperative complications. A patient who is well informed about the surgical experience is less likely to be fearful and can prepare to participate in the postoperative recovery phase so that outcomes can be met. Diagnosis, interventions, and outcomes are established to ensure recovery or maintenance of the preoperative state.

Goals and Outcomes

The preoperative care plan is based on individualized nursing diagnoses. This plan is reviewed and modified during the intraoperative and postoperative periods. Outcomes established for each goal of care provide measurable behavioural evidence to gauge the patient's progress toward meeting the stated goals.

The following example provides a goal of care and expected outcomes relevant for the preoperative surgical patient:

► BOX 48-3 NURSING DIAGNOSTIC PROCESS (ACKLEY & LADWIG, 2011)

Assessment Activities	Defining Characteristics	Nursing Diagnosis
Ask patient to describe previous surgical experiences.	Patient mentions a traumatic prior experience with surgery	<i>Fear related to knowledge deficit and previous surgical experience</i>
Ask patient about preoperative education and preparation before admission.	Unaware of preoperative testing	
Observe patient's nonverbal behaviour.	Patient's behaviour indicates fear and tension	
Assess vital signs.	Increased heart rate	

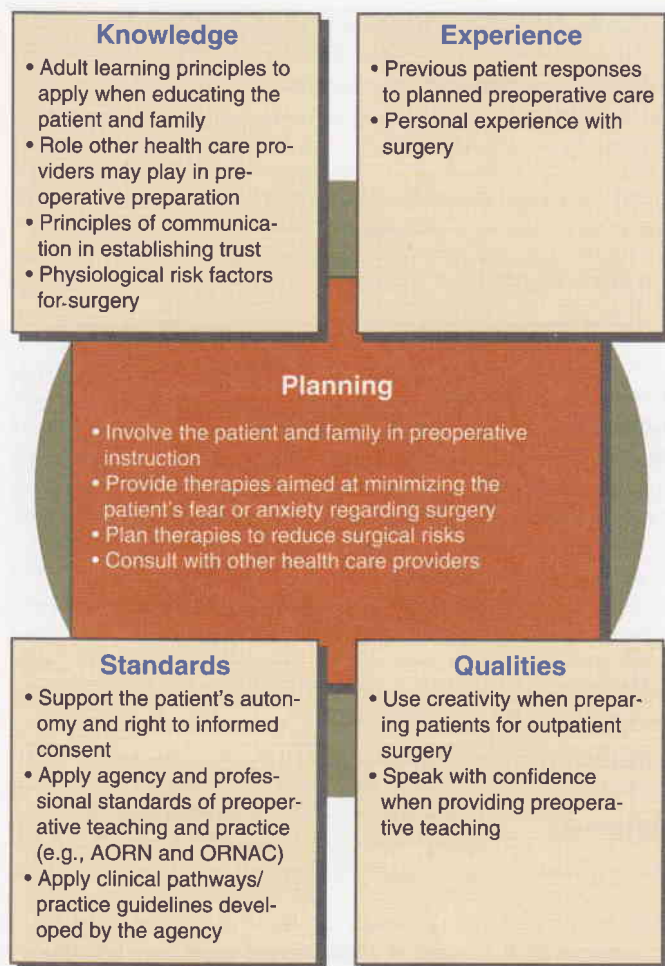


Figure 48-2 Critical thinking model for surgical patient planning.

- Patient is able to verbalize the significance of postoperative exercises.
- Patient verbalizes prevention of lung congestion and pneumonia as reasons for deep breathing and coughing exercises. Incentive spirometer to facilitate lung expansion is used less routinely now (Fanning, 2004). More recently, Agostini & Singh (2009) conducted a review of the literature examining the use of incentive spirometry following thoracic surgery. Postoperative physiotherapy regimes with or without incentive spirometry appeared to be effective following thoracic surgery, compared to no physiotherapy. However, the authors stressed that further studies need to be done in this area.
- Patient verbalizes promotion of blood flow to prevent leg clots as reason for postoperative leg exercises.
- Patient verbalizes rationale for early ambulation, as it improves lung function, assists with return of bowel function, and promotes recovery.

Setting Priorities

Using clinical judgement, you should prioritize nursing diagnoses and interventions based on the assessed unique needs of each patient. Patients who need emergency surgery may experience changes in their physiological status that require the nurse to reprioritize quickly. For example, if a patient's blood pressure begins to drop, hemodynamic stabilization becomes a priority over education and stress management. Generally, when the preoperative situation is more controlled, the approach to each patient must be thorough and reflect an understanding of the implications of the patient's age, physical and psychological health, educational level, and cultural and religious practices. Increasingly, patients are preparing advanced medical directives to indicate their wishes should unexpected aggressive medical treatment be required after surgery.

► BOX 48-4 NURSING CARE PLAN

Deficient Knowledge Regarding Preoperative and Postoperative Care Requirements

Assessment

Mrs. Campana is an 80-year-old woman scheduled to be admitted in five days for elective bowel resection. Joe Marrero is the nurse in the clinic surgery service assigned to prepare Mrs. Campana for surgery. During his initial discussion with Mrs. Campana, Joe observes her to be alert and oriented. Mrs. Campana has severely reduced visual acuity but is able to hear Joe's questions clearly.

Assessment Activities

Ask Mrs. Campana about previous surgeries and her experience with them.

Ask Mrs. Campana what she has been told regarding her surgery.

Ask Mrs. Campana what she has been told regarding preoperative preparation and what to expect postoperatively.

Findings and Defining Characteristics

She responds, "I had surgery over 20 years ago, and I was in the hospital for 10 days."

She states that her surgeon explained the procedure using a drawing of the bowel and indicating the location of the part to be removed.

She states that she received information from the surgeon's office regarding medicines to stop taking and those she should take on the morning of surgery, her diet before surgery and when to stop eating, and who to call with questions. She does not recall receiving information regarding what to expect postoperatively.

Continued

► BOX 48-4 NURSING CARE PLAN—cont'd

Assessment Activities

Assess Mrs. Campana's ability to read typical font type.

Assess Mrs. Campana's family and support system for preoperative and postoperative assistance.

Findings and Defining Characteristics

She is unable to read the text font on the newspaper; she can read the headlines with her glasses.

She states that her daughter will be coming into town on the day of surgery to help her after surgery.

Nursing Diagnosis: Deficient knowledge regarding preoperative and postoperative care requirements related to lack of exposure to information.

Planning

Goals (Nursing Outcomes Classification)*

Patient will understand the postoperative routines of surgical care by day before surgery.

Patient will participate actively in postoperative recovery activities by day 1 after surgery.

Expected Outcomes

Knowledge of Treatment Procedures

Patient will discuss monitoring routines after surgery by morning of surgery in the preoperative period.

Patient will be able to describe importance of postoperative exercises by morning of surgery, including turn, cough, and deep breathing; incentive spirometer; leg exercises.

Patient will be able to describe schedule for activity and nutritional management postoperatively by day 1 after surgery.

Patient will successfully perform postoperative exercises by morning of surgery in the preoperative period.

*Outcome classification labels from Moorhead, S., Johnson, M., & Maas, M. L. (Eds.). (2008). *Nursing outcomes classification (NOC)* (4th ed.). St Louis, MO: Mosby.

Interventions (Nursing Interventions Classification)[†]

Teaching in the Preoperative Period

Provide patient with audiotape program that explains preoperative and postoperative routines. Supply instruction booklet designed for the visually impaired. Make a follow-up call to patient and to her daughter to give them an opportunity to ask questions and voice concerns. Document all phases of education—preoperative before admission, day of surgery, and postoperative—provided to patient in her record.

On admission to hospital, demonstrate to patient and daughter the performance of postoperative exercises and how to get out of bed.

Explain sensations to be expected postoperatively (e.g., incisional pain that will be controlled with medications, intravenous [IV], nasogastric tube, wound care, frequent vital signs assessments).

Give patient opportunity to return demonstrate postoperative exercises before surgery.

Correct any unrealistic expectations the patient or daughter may have regarding surgery.

Rationale

Preadmission education can require less teaching time and better performance of exercises on admission. Education has a beneficial effect in reducing postoperative anxiety (Shuldhham, 1999).

Demonstration is an effective method to reinforce didactic instruction.

Teaching about sensory aspects (what the patient sees, feels, smells) should be structured (Shuldhham, 1999).

Return demonstration measures patient learning and provides an opportunity to reinforce instruction.

Unrealistic expectations, when unmet, can contribute to patient's anxiety. Psychological preparation for surgery reduces anxiety.

[†]Intervention classification labels from Dochterman, J. M., Bulechek, G. M., & Butcher, H. K. (Eds.). (2008). *Nursing interventions classification (NIC)* (5th ed.). St Louis, MO: Mosby.

Evaluation

Nursing Actions

Ask patient to describe typical monitoring and care activities after surgery. Document evaluation of patient's understanding and demonstration of learned activities in patient's record.

Patient Response and Finding

She is able to verbalize typical monitoring and care after surgery. She states that the instruction booklet and audiotape were both helpful.

Achievement of Outcome

Mrs. Campana has a good understanding of the typical postoperative course.

► BOX 48-4 NURSING CARE PLAN—cont'd

Nursing Actions	Patient Response and Finding	Achievement of Outcome
Observe patient's demonstration of postoperative exercises.	She is able to demonstrate leg exercises and deep breathing and coughing exercises but is having difficulty with incentive spirometer use.	Mrs. Campana is able to demonstrate most of the postoperative exercises but needs further teaching and practice on incentive spirometer use.
Explore with patient and daughter if they have any remaining fears or concerns.	Both Mrs. Campana and her daughter deny any fears or concerns at the present time.	Informational and psychological needs of Mrs. Campana and her daughter have been met.

❖ Implementation

Preoperative nursing interventions provide the patient with an understanding of the surgery and prepare the patient not only physically and psychologically for surgical intervention but also to be an active participant in the recovery process.

Informed Consent

Surgery cannot be legally or ethically performed until a patient understands the need for a procedure, the steps involved, the risks, the expected results, and alternative treatments. The surgeon is responsible for explaining the procedure and obtaining the **informed consent**. Often today, the consent is signed in the physician's office or in the preadmission unit. If, as a nurse, you are involved in obtaining the signature, you must ensure before signing that the patient understands the procedure. If the patient is unclear about the procedure, the consent should not be signed and the physician should be notified (see Chapter 8).

Preoperative Teaching

Education is an important aspect of the patient's surgical experience. Preoperative teaching reflects a patient's expected postoperative recovery. This teaching has a positive influence on the patient's recovery. For example, Oetker-Black et al. (2003) found that an efficacy-enhancing teaching protocol for patients post-hysterectomy enhanced ambulation postoperatively. Nurses in preadmission clinics may call patients up to one week before surgery to answer the patient's questions and reinforce explanations. Preoperative information and instructions may include telephone calls, mailings from the physician's office or hospital, preoperative teaching guidelines and checklists, and the use of videotapes or **clinical pathways** (Figure 48-3).

Pritchard (2011) discussed the importance of giving appropriate information to patients preoperatively. Information needs to be tailored to address patients' individual needs (Suhonen & Leino-Kilpi, 2006). This targeted information, then, is meaningful to the patient. Carr et al. (2005), in a study of women having major gynecological surgery, examined the women for anxiety, depression, and pain after surgery. They concluded that patients, especially those who are particularly anxious, can benefit from specific information prior to surgery, such as their length of stay or what their pain will be like. Pritchard (2011) suggests that the use of standard information sheets such as preoperative information sheets is not sufficient to address patients' information needs or reduce their preoperative anxiety.

Including family members in preoperative preparation is advised. Family members need to be aware of the normal expectations after discharge from hospital. They also may

recognize untoward events that may unfold once the patient is home. If anxious relatives do not understand routine postoperative events, their anxiety will likely heighten the patient's fears and concerns. Preoperative preparation of family members can help to minimize anxiety and misunderstanding.

You should provide patients with information about sensations typically experienced after surgery. Preparatory information helps patients anticipate the steps of a procedure and thus helps them form realistic images of the surgical experience. When events occur as predicted, patients are better able to cope and attend to them. For example, in the OR, the anesthesiologist may apply ointment to patients' eyes to prevent corneal damage. Warning patients about sensations of blurred vision will reduce their anxiety on awakening from surgery. Sensations that you may describe include expected pain at the surgical site, tightness of dressings, dryness of the mouth, or a sore throat resulting from an endotracheal tube.

Anxiety and fear are barriers to learning, and both emotions are heightened as surgery approaches. You should assess the surgical patient's readiness and ability to learn. If the patient is capable of and receptive to learning, present information in a logical sequence, beginning with preoperative events and advancing to intraoperative and postoperative routines. The following demonstrates a patient's understanding of the surgical experience.

Patient Cites Reasons for Preoperative Instructions and Exercises. If given a rationale for preoperative and postoperative procedures, the patient is better prepared to participate in his or her care. Every preoperative teaching program includes explanation and demonstration of postoperative exercises: diaphragmatic breathing, coughing, turning, and leg exercises. These exercises are designed to prevent postoperative complications (Skill 48-1). Remember that physiotherapists, as part of the interprofessional team, can facilitate patient mobility postoperatively.

If the patient is measured for elastic stockings or sequential compression devices, you must teach about the purpose of these devices and the nursing care that will be required after their application (see Chapter 45).

After explaining each exercise, you should demonstrate it. You act as a coach, guiding the patient through each exercise. For example, you assess whether the patient is sitting properly and help the patient place his or her hands in the proper position during breathing. You then allow the patient time for independent practice and return to evaluate effectiveness before surgery.

Patient States the Time of Surgery. The patient and family should be told the approximate time that surgery will begin. If the hospital has a busy OR schedule, it is best to let them know whether other procedures are scheduled before the

Text continued on p. 1348



The Ottawa Hospital
L'Hôpital d'Ottawa

CLINICAL PATHWAY – PLAN CLINIQUE

Total Hip Arthroplasty, Primary and Revision Arthroplastie totale de la hanche, primaire et réintervention

☐ Civic ☐ Gen.-Gén.

Addressograph/Plaque

IN
PATIENT
5
FLOW
SHEET

PAU — Unité pré-admission	Day of Surgery Pre-op — SDA/SDCU — Jour de la chirurgie pré-opératoire
Date: yyaa _____ mm _____ dj _____	Date: yyaa _____ mm _____ dj _____
Critical Path	Critical Path
- Assessment & teaching per PAU standard of care and procedure specific education material. - Pre-operative diagnostic testing as per PAU Medical Directive for Pre-Admission Diagnostic Testing for Elective Surgery. Tests - PTT, INR - CBC - Type and screen to ensure minimum of 2 units pRBCs (including autologous blood) Additional Orders - X-ray: AP pelvis (top of film @ ASIS) and lateral of affected hip Discharge Planning - Discuss expected length of stay (LOS) - Discuss issues that could cause delay of discharge and discuss discharge preparation - Ensure patient has Total Hip Arthroplasty education booklet	- Assessment and teaching per same day admission standard of care and procedure specific education material. Tests - Glucose meter: for diabetic patient - PTT/INR: for patient normally taking warfarin (Coumadin) – Unless normal result obtained after warfarin discontinued per pre-op instructions - Electrolytes: for dialysis dependant patient unless acceptable post-dialysis results obtained within 24 h of surgery - CBC if autologous blood donor Additional Orders - IV NS at 50 mL/h if IV medications to be given in SDA/SDCU OR If patient is insulin-dependent diabetic: IV D5W @ 100 mL/h Antibiotics: - If No history of allergy to penicillin or to other beta-lactam antibiotics; or - History of non-life threatening reaction to penicillin or other beta-lactam antibiotics (eg. rash, diarrhea, stomach upset) IV Cefazolin on chart for administration in OR: 1 g if weight < 60 kg 2 g if weight ≥ 60 kg Or - If patient has a history of life threatening reaction (hypotension, bronchospasm, urticaria, angioedema) to penicillin or other beta-lactam antibiotics IV Vancomycin: 1 g if weight < 90 kg (infuse over 60 minutes pre-op) 1.5 g if weight ≥ 90 kg (infuse over 90 minutes pre-op)
Patient Outcomes	Patient Outcomes
Patient/Family Teaching - Understands pre-op instructions and events - Understands usual post-op course, plan for pain management, and usual self care measures to prevent post-op complications Discharge Planning - Understands usual LOS - Appropriate discharge plan in place or if no suitable discharge plan in place – social work has been consulted	Patient Teaching - Adherence with pre-op instructions - Understands usual events/expectations of operative day - Understands usual post-op course, plan for pain management, and usual self care measures to prevent post-op complications
Patient progress corresponds with clinical pathway	Patient progress corresponds with clinical pathway
Nursing: ☐ Yes ☐ No Signature: _____ Time: _____ NTV – circle above, VC _____	Nursing: ☐ Yes ☐ No Signature: _____ Time: _____ NTV – circle above, VC _____
Variance Codes (VC) 186 Activity variance 653 Consult not sent by Day 3 492 Not discharged by end of pathway – continued need for acute care	510 Not discharged by end of pathway – non-medical reason NTV Non-Tracked Variance OFF Ordered off clinical pathway

Figure 48-3 Preoperative patient instructions for a clinical pathway for a total hip arthroplasty. The first day of a six-day pathway highlights what the patient can expect before surgery. **Source:** Courtesy of The Ottawa Hospital, Ottawa, ON.

► SKILL 48-1 Demonstrating Postoperative Exercises

**Delegation Considerations**

The skill of demonstrating postoperative exercises should not be delegated to unregulated care providers (UCPs). However, other aspects of patient care may be delegated. When using UCPs be sure to do the following:

- Educate the UCP to encourage patients to practise exercises regularly, following instruction.
- Instruct the UCP to inform you if patients are unwilling to perform these exercises.

Equipment

- Pillow or wrapped blanket (used to splint surgical incision during coughing)
- Incentive spirometry may be used less routinely now (Fanning, 2004)
- Positive expiratory pressure (PEP) device

Procedure**STEPS**

1. Assess the patient's risk for postoperative respiratory complications. Review the medical history to identify presence of chronic pulmonary conditions (e.g., emphysema, chronic bronchitis, asthma), any condition that affects chest wall movement, history of smoking, and presence of reduced hemoglobin.
2. Assess ability to cough and breathe deeply by having the patient take a deep breath and observing movement of shoulders and chest wall. Measure chest excursion during deep breath. Ask patient to cough after taking deep breath.
3. Assess risk for postoperative thrombus formation. (Older patients, those with active cancer, and those immobilized for more than three days are most at risk.) Observe for localized tenderness along the distribution of the venous system, swollen calf or thigh, calf swelling more than 3 cm compared with asymptomatic leg, pitting edema in symptomatic leg, and collateral superficial veins. If any of these signs are present, notify the physician.

RATIONALE

- General anaesthesia predisposes the patient to respiratory problems because the lungs are not fully inflated during surgery and the cough reflex is suppressed, so that mucus collects within airway passages. After surgery, the patient may have reduced lung volume and require greater efforts to cough and breathe deeply; inadequate lung expansion can lead to atelectasis and pneumonia. The patient is at greater risk for developing respiratory complications if other chronic lung conditions are present. Smoking damages ciliary clearance and increases mucous secretion. Reduced hemoglobin level can lead to inadequate oxygenation.
- Reveals maximum potential for chest expansion and ability to cough forcefully; serves as baseline to measure ability to perform exercises after surgery.
- Venous stasis, decreased perfusion, and vein trauma exist simultaneously for thrombus formation to occur (Lewis et al., 2010). After general anaesthesia, circulation is slowed, thus increasing the risk for clot formation. Immobilization results in decreased muscular contraction in the lower extremities, which promotes venous stasis.

Critical Decision Point: A positive Homans' sign (calf pain when dorsiflexing the patient's foot with knee flexed) has been found to have a low specificity for deep vein thrombosis (DVT) diagnosis and often is not present or may be present when no DVT exists (Anand et al., 1998; Tick et al., 2002).

4. Assess the patient's ability to move independently while in bed.
5. Explain postoperative exercises to the patient, including their importance to recovery and physiological benefits.
6. Demonstrate exercises.
 - A. **Diaphragmatic breathing**
 - (1) Assist the patient to a comfortable sitting position on side of bed or in chair or to standing position.
 - (2) Stand or sit facing the patient.

- Determines existence of any mobility restrictions.
- Information allows the patient to understand the significance of exercises and can motivate learning. People tend to learn new skills when benefits can be gained.
- Upright position facilitates diaphragmatic excursion.
- Allows the patient to observe the breathing exercise.

Continued

► SKILL 48-1 Demonstrating Postoperative Exercises—cont'd

video

- (3) Instruct the patient to place palms of hands across from each other, down and along lower borders of anterior rib cage. Place tips of third fingers lightly together (see Step 6A[3] illustration). Demonstrate for the patient.



Step 6A(3) Deep breathing exercise—placement of hands on upper abdomen during inhalation.

- Position of hands allows the patient to feel movement of the chest and abdomen as the diaphragm descends and lungs expand.
- (4) Have the patient take slow, deep breaths, inhaling through the nose and pushing abdomen against hands. Tell the patient to feel the middle fingers separate during inhalation. Demonstrate.
 - (5) Explain that the patient will feel normal downward movement of the diaphragm during inspiration. Explain that abdominal organs descend and the chest wall expands.
 - (6) Avoid using auxiliary chest and shoulder muscles while inhaling and instruct the patient in same manner.
 - (7) Have the patient hold a slow, deep breath for a count of three and then slowly exhale through the mouth as if blowing out a candle (with pursed lips). Tell the patient that middle fingertips will touch as the chest wall contracts.
 - (8) Repeat breathing exercise three to five times.
 - (9) Have the patient practise the exercise. Instruct the patient to take 10 slow, deep breaths every hour while awake during the postoperative period until mobile.
- B. Incentive spirometry** (may be used less routinely now)
- (1) Perform hand hygiene.
 - (2) Instruct the patient to assume semi-Fowler's or high-Fowler's position.
 - (3) Either set or indicate to the patient on the device scale the volume level to be attained with each breath.
 - (4) Demonstrate to the patient how to place the mouthpiece of the spirometer so that the lips completely cover it (see Step 6B[4] illustration).
- Taking slow, deep breaths prevents panting or hyperventilation. Inhaling through the nose warms, humidifies, and filters air.
 - Explanation and demonstration focus on normal ventilatory movement of the chest wall. The patient develops understanding of how diaphragmatic breathing feels.
 - Using auxiliary chest and shoulder muscles increases useless energy expenditure.
 - Allows for gradual expulsion of all air and helps prevent airway collapse by facilitating the maintenance of positive airway pressure.
 - Allows the patient to observe a slow, rhythmic breathing pattern.
 - Repetition of the exercise reinforces learning. Regular deep breathing prevents postoperative complications.
 - Reduces transmission of microorganisms.
 - Promotes optimal lung expansion during respiratory manoeuvre.
 - Establishes goal of the volume level necessary for lung expansion.
 - The higher the setting, the more effort will be required by the patient. Ideally it should deliver a pressure range of 10–20 cm H₂O during passive expiration (American Association for Respiratory Care [AARC], 2002)

► SKILL 48-1 Demonstrating Postoperative Exercises—cont'd

video

- (5) Instruct the patient to inhale slowly and maintain constant flow through the unit, attempting to reach goal volume. When maximal inspiration is reached, the patient should hold breath for two to three seconds (see Step 6B[5] illustration) and then exhale slowly. Number of breaths should not exceed 10 to 12 per minute in each session.

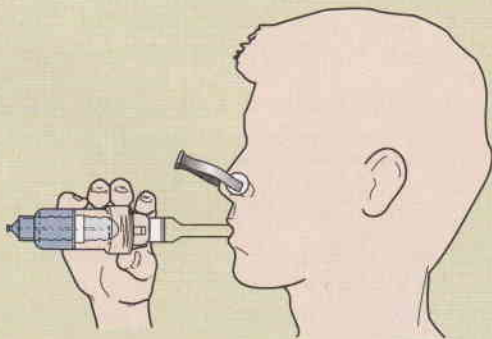


Step 6B(4) Patient inhales using incentive spirometer.

- (6) Instruct the patient to breathe normally for a short period.
 (7) Have the patient repeat the manoeuvre until goals are achieved.
 (8) Perform hand hygiene.

C. Positive expiratory pressure (PEP) therapy and "huff" coughing

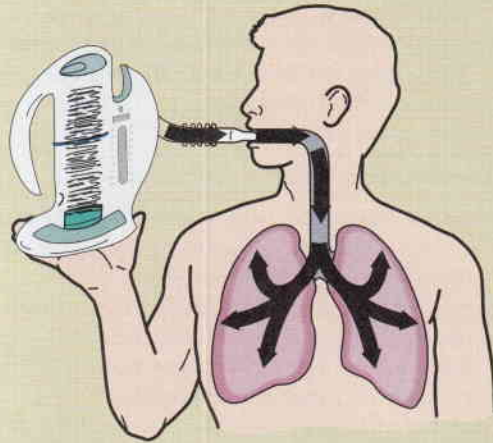
- (1) Perform hand hygiene.
 (2) Set PEP device to the setting ordered.
- (3) Instruct the patient to assume semi-Fowler's or high-Fowler's position and place nose clip on the patient's nose (see Step 6C[3] illustration).



Step 6C(3) Positive expiratory pressure device. **Source:** Perry, A. G., & Potter, P. A. (2010). Preoperative and postoperative care. In A. G. Perry & P. A. Potter, *Clinical nursing skills and techniques* (7th ed., p. 951). St Louis, MO: Elsevier.

- (4) Have the patient place lips around the mouthpiece. The patient should take a full breath and then exhale two to three times longer than inhalation. Pattern should be repeated for 10 to 20 breaths.
 (5) Remove device from the mouth and have the patient take a slow, deep breath and hold for three seconds.

- Maintains maximal inspiration and reduces risk of progressive collapse of individual alveoli. Slow breath prevents or minimizes pain from sudden pressure changes in chest.



Step 6B(5) Incentive spirometer increases flow of air into lungs.

- Prevents hyperventilation and fatigue.
- Ensures correct use of spirometer.
- Reduces transmission of microorganisms.
- Reduces transmission of microorganisms.
- The higher the setting, the more effort will be required by the patient. Ideally, the device should deliver 10 to 20 cm of water during passive expiration (American Association for Respiratory Care [AARC], 2002).
- Promotes optimal lung expansion and expectoration of mucus (AARC, 2002).

- Ensures that all breathing is done through the mouth and that the device is used properly.
- Promotes lung expansion before coughing.

Continued

► SKILL 48-1 Demonstrating Postoperative Exercises—cont'd



- (6) Instruct the patient to exhale in quick, short, forced exhalations or “huffs.”

D. Controlled coughing

- (1) Explain the importance of maintaining an upright position.
 - (2) Demonstrate coughing. Take two slow, deep breaths, inhaling through the nose and exhaling through the mouth.
 - (3) Inhale deeply a third time and hold breath to count of three. Cough fully for two or three consecutive coughs without inhaling between coughs. (Tell the patient to push all air out of lungs.)
- “Huff” coughing, or forced expiratory technique, promotes bronchial hygiene through increased expectoration of secretions.
 - Position facilitates diaphragm excursion and enhances thorax expansion.
 - Deep breaths expand the lungs fully so that air moves behind mucus and facilitates the effects of coughing.
 - Consecutive coughs help remove mucus more effectively and completely than one forceful cough.

Critical Decision Point: Coughing may be contraindicated after brain or eye surgery.

- (4) Caution the patient against simply clearing the throat instead of coughing. Explain that coughing will not cause injury to incision when done correctly.
 - (5) If surgical incision will be abdominal or thoracic, teach the patient to place one hand over the incisional area and the other hand on top of it. During breathing and coughing exercises, the patient presses gently against the incisional area to splint or support it. A pillow over the incision is optional (see Step 6D[5] illustration).
- Clearing the throat does not remove mucus from deep in airways. Postoperative incisional pain makes it harder for the patient to cough effectively.
 - Surgical incision cuts through muscles, tissues, and nerve endings. Deep breathing and coughing exercises place additional stress on the suture line and cause discomfort.
 - Splinting the incision with hands provides firm support and reduces incisional pulling. (Some patients prefer to have a pillow to place over the incision.)



Step 6D(5) Techniques for splinting incision. **Source:** Lewis, S. M., Heitkemper, M. M., Dirksen, S. R., O'Brien, P. G., Bucher, L., Barry, M. A., Goldsworthy, S., & Goodridge, D. (2010). *Medical-surgical nursing: Assessment and management of clinical problems* (2nd Canadian ed., p. 437). Toronto: Elsevier.

- (6) The patient continues to practise coughing exercises, splinting imaginary incision. Instruct the patient to cough two to three times every two hours while awake.
 - (7) Instruct the patient to examine sputum for consistency, odour, amount, and colour changes.
- Value of deep coughing with splinting is stressed to expectorate mucus effectively with minimal discomfort.
 - Sputum consistency, odour, amount, and colour changes may indicate presence of pulmonary complication, such as pneumonia.

E. Turning

- (1) Instruct the patient to assume supine position and move to side of bed if permitted by surgery. Have the patient move by bending knees and pressing heels against the mattress to raise and move buttocks (see Step 6E[1] illustration). Top side rails on both sides of the bed should be raised.
 - (2) Instruct the patient to place right hand over the incisional area to splint it.
 - (3) Instruct the patient to keep right leg straight and flex left knee up (see Step 6E[3] illustration). If back or vascular surgery is being performed, patient will need to logroll or will require assistance with turning.
- Positioning begins on side of the bed so that turning to other side will not cause the patient to roll toward the bed's edge.
 - Supports and minimizes pulling on the suture line during turning.
 - Straight leg stabilizes the patient's position. Flexed left leg shifts weight for easier turning.



Step 6E(1) Buttocks lift.



Step 6E(3) Leg position for turning.

► SKILL 48-1 Demonstrating Postoperative Exercises—cont'd

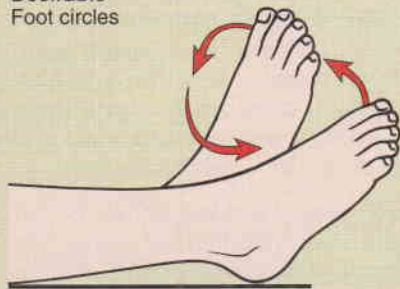
- (4) Have the patient grab the right side rail with left hand, pull toward right, and roll onto right side.
- (5) Instruct the patient to turn every two hours while awake.

F. Leg exercises

- (1) Have the patient assume supine position in bed. Demonstrate leg exercises by performing passive range-of-motion exercises and simultaneously explaining exercise.
- (2) Rotate each ankle in complete circle. Instruct the patient to draw imaginary circles with big toe (see Step 6F[2] illustration). Repeat five times.

- Pulling toward side rail reduces effort needed for turning.
- Reduces risk of vascular and pulmonary complications.
- Provides normal anatomical position of lower extremities.
- Leg exercises maintain joint mobility and promote venous return to prevent thrombi.

Desirable
Foot circles

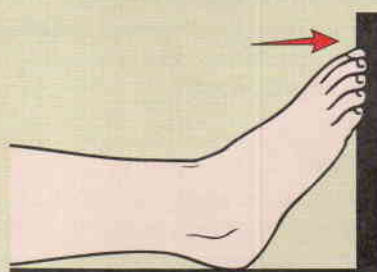
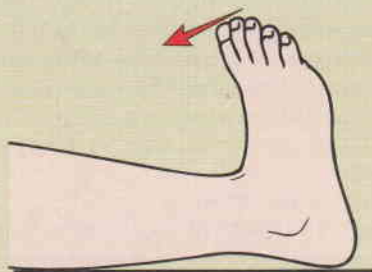


Step 6F(2) Foot circles. **Source:** Lewis, S. M., Heitkemper, M. M., Dirksen, S. R., O'Brien, P. G., Bucher, L., Barry, M. A., Goldsworthy, S., & Goodridge, D. (2010). *Medical-surgical nursing in Canada: Assessment and management of clinical problems* (2nd Canadian ed., p. 439). Toronto: Elsevier.

- (3) Alternate dorsiflexion and plantar flexion of both feet. Direct the patient to feel calf muscles contract and relax alternately (see Step 6F[3] illustrations, parts A and B). Repeat five times.

- Stretches and contracts gastrocnemius muscles.

Essential
Alternate dorsiflexion and plantar flexion



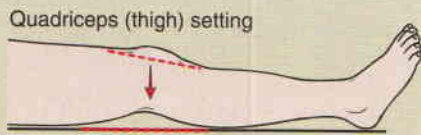
Step 6F(3) A, Alternate dorsiflexion and plantar flexion. **B,** Patient pushes feet to perform plantar flexion. **Source:** Lewis, S. M., Heitkemper, M. M., Dirksen, S. R., O'Brien, P. G., Bucher, L., Barry, M. A., Goldsworthy, S., & Goodridge, D. (2010). *Medical-surgical nursing in Canada: Assessment and management of clinical problems* (2nd Canadian ed., p. 439). Toronto: Elsevier.

Continued

► SKILL 48-1 Demonstrating Postoperative Exercises—cont'd

video

- (4) Perform quadriceps setting by tightening thigh and bringing knee down toward mattress, then relaxing (see Step 6F[4] illustration). Repeat five times.
- (5) Have the patient alternately raise each leg straight up from the bed surface, keeping legs straight, and then have the patient bend leg at hip and knee (see Step 6F[5] illustration). Repeat five times.



Step 6F(4) Quadriceps (thigh) setting. **Source:** Lewis, S. M., Heitkemper, M. M., Dirksen, S. R., O'Brien, P. G., Bucher, L., Barry, M. A., Goldsworthy, S., & Goodridge, D. (2010). *Medical-surgical nursing in Canada: Assessment and management of clinical problems* (2nd Canadian ed., p. 439). Toronto: Elsevier.

7. Have the patient practise exercises at least every two hours while awake. Instruct the patient to coordinate turning and leg exercises with diaphragmatic breathing, incentive spirometry, and coughing exercises.
8. Observe the patient's ability to perform all five exercises independently.



Step 6F(5) Hip and knee movements. **Source:** Lewis, S. L., Heitkemper, M. M., Dirksen, S. R., O'Brien, P. G., Bucher, L., Barry, M. A., Goldsworthy, S., & Goodridge, D. (2010). *Medical-surgical nursing in Canada: Assessment and management of clinical problems* (2nd Canadian ed., p. 439). Toronto: Elsevier.

- Contracts muscles of upper legs, maintains knee mobility, and enhances venous return.
- Promotes contraction and relaxation of quadriceps muscles.
- Repetition of sequence reinforces learning. Establishes routine for exercises that develops habit for performance. Sequence of exercises should be leg exercises, turning, breathing, incentive spirometry, and coughing.
- Ensures that the patient has learned correct techniques. Documents the patient's education and provides data for instructional follow-up.

Unexpected Outcomes

Inability to perform exercises correctly after surgery

Unwillingness to perform exercises postoperatively because of incisional pain of thorax or abdomen (deep breathing, coughing, and turning) or because of surgery involving lower abdomen, groin, buttocks, or legs (leg exercises, turning)

Related Interventions

- Assess for the presence of anxiety, pain, and fatigue.
- Teach the patient stress reduction techniques, pain management strategies, or both.
- Repeat the teaching, using additional demonstration or redemonstration at a time when family members or friends are present.
- Instruct the patient to ask for pain medication 30 minutes before performing postoperative exercises or to use patient-controlled analgesia (PCA) immediately before exercising.
- Report to the surgeon inadequate pain relief and the need to change analgesic or increase dose.

Recording and Reporting

- Record the exercises demonstrated and whether the patient can perform them independently.
- Report any problems the patient has in practising exercises to the nurse assigned to the patient on the next shift for follow-up.

patient's. The surgeon usually informs the patient and family of the anticipated length of surgery. Unanticipated delays may occur for many reasons. The family needs to be aware that delays do not necessarily indicate a problem.

Patient Knows Where the Postoperative Unit Is and Where the Family Will Be During Surgery and Recovery. The unit to which the patient is admitted before surgery may be different from the postoperative unit. The family needs to know where the patient will be taken after surgery. You also should explain where the family can wait and where the surgeon will attempt to find family members after surgery. Many institutions have implemented programs in which the circulating nurse gives periodic reports to the family in the waiting room when prolonged surgeries are involved. If the patient will be taken to a special unit postoperatively, it helps to orient the patient and family members to the unit's environment before surgery. Programs designed to connect

with the family also have been developed in day-surgery areas (Andrews, 2009).

Patient Discusses Anticipated Postoperative Monitoring and Therapies. The patient and family need to know about postoperative events. If they understand the frequency of postoperative vital sign monitoring before surgery occurs, they will be less apprehensive when nurses measure vital signs. You can also explain whether the patient is likely to have IV lines, monitoring lines, dressings, or drainage tubes or whether he or she will require ventilator support.

Patient Describes Surgical Procedures and Postoperative Treatment. After the surgeon has explained the basic purpose of the surgical procedure, the patient may ask you additional questions to clarify any misunderstandings. Preestablished teaching standards, such as those integrated in clinical pathways for preoperative and postoperative care (Figure 48-4), give you an excellent guide for instruction. A

Patient(e) _____ Chart No. – N° du dossier _____

Post-op Day 1 — Jour 1 post-opératoire			
Date: yyaa _____ mm _____ dj _____			
Critical Path		Patient Outcomes	
Assessments/Treatments • VS, NVS, Pain q4h → q shift, SpO₂ • Monitor dressing / Hemovac • Monitor Intake & Output • Pain management as per APS – Discontinue APS modality as per weaning guideline if patient meets criteria – If single dose intrathecal only: discontinue from APS 24 hours following time of injection Activity • DB&C • Exercise program • Pivot transfer with walker • Confirm weight bearing status • Up in chair x 2 _____ initial, _____ initial • Ambulate x 1 with assistance: _____ initial • Assistive devices, specify: _____ Nutrition • Diet as ordered Elimination • Catheter as ordered Patient Teaching • Reinforce exercise program • Proper pillow positioning • Hip precautions • If on Low Molecular Weight Heparin – start self injection teaching and provide booklet • Ensure patient has Total Hip Arthroplasty patient information booklet • Pain management		Pain Control • Adequate pain control achieved: Pain ≤ 3 rest, ≤ 5 activity; pain not preventing movement; satisfied with pain control Activity • Completes transfer with assistance • Performs exercises according to self directed exercise program Prevention of DVT • Demonstrates appropriate exercises & positioning for prevention of DVT • Verbalizes understanding of anticoagulant therapy Patient Teaching • Verbalizes understanding of "Total Hip Arthroplasty" instructions and exercise program • Understands basics of self injection if applicable • Demonstrates: – Proper positioning – Understanding of weight-bearing status	
Patient progress corresponds with clinical pathway			
Physiotherapy: ☐ Yes ☐ No Signature: _____ Time: _____ NTV – circle above, VC _____			
Nursing: D ☐ Yes ☐ No Signature: _____, Initial _____ Time: _____ NTV – circle above, VC _____			
E ☐ Yes ☐ No Signature: _____, Initial _____ Time: _____ NTV – circle above, VC _____			
N ☐ Yes ☐ No Signature: _____, Initial _____ Time: _____ NTV – circle above, VC _____			
D = 8-12 h day shift		E = evening shift, if applicable	
N = 8-12 h night shift			
Variance Codes (VC) 186 Activity variance 653 Consult not sent by Day 3 492 Not discharged by end of pathway – continued need for acute care		510 Not discharged by end of pathway – non-medical reason NTV Non-Trackd Variance OFF Ordered off clinical pathway	

Figure 48-4 Postoperative patient instructions for a clinical pathway for a total hip arthroplasty. Highlights what the patient can expect on the first day after surgery. **Source:** Courtesy of The Ottawa Hospital, Ottawa, ON.

good starting point is to ask what the patient has been told. If the patient has limited understanding about the surgery, you can provide additional explanations. If necessary, the surgeon can be asked to re-inform the patient.

Patient Describes Postoperative Activity Resumption. The type of surgery a patient undergoes affects the speed with which normal physical activity and regular eating habits can be resumed. You should explain that it is normal to progress gradually in both activity and eating. If the patient tolerates activity and diet well, activity levels will progress more quickly.

Patient Describes Pain-Relief Measures. Typically, one of the surgical patient's fears is pain. The family is also concerned for the patient's comfort. Pain after surgery is expected. You should inform the patient and family of interventions available for pain relief (e.g., analgesics, positioning, splinting, and relaxation exercises; see Chapter 41). The patient needs to know the schedule for analgesic drugs, their route of administration, and their effects.

Surgical patients may avoid taking pain-relief drugs for fear of becoming dependent on them. You should encourage the patient to use analgesics as needed and explain to the patient that the risks of becoming dependent are minimal. Explain to the patient that unless the pain is controlled, it will be difficult for the patient to participate in postoperative therapy such as mobilization. The patient should be encouraged to inform you before the pain becomes a constant discomfort. If a patient waits until pain becomes excruciating, an analgesic may not provide relief at the dose ordered. Patients who will have patient-controlled analgesia (PCA) after surgery should be taught how to push the button when they begin to feel discomfort and should understand that use of PCA will not cause overmedication (see Chapter 41). The patient should also understand the length of time that it takes for the drug to begin working. Information from preoperative assessment will be helpful to you when teaching about pain-relief measures. Pain reporting and expectations regarding pain management based on a patient's cultural beliefs are areas that need to be explored both individually and systematically through research (Douglas, 1999; Ramer et al., 1999).

Patient Expresses Feelings Regarding Surgery. If the patient is admitted to hospital during the preoperative surgical phase, frequent visits by staff, diagnostic testing, and physical preparation for surgery consume a lot of time; as a result, the patient has few opportunities to reflect on the upcoming surgical experience. You must recognize the patient as a unique individual. The patient and family need time to express their feelings about the surgery. The patient's level of anxiety influences the frequency of discussions. While delivering bedside care, you can encourage expression of concerns. Family members may wish to discuss their concerns without the patient present so that their fears will not frighten the patient and vice versa. Establishing a trusting and therapeutic relationship with the patient and family allows this to happen.

Acute Care

Activities in the acute care setting during the preoperative phase focus on interventions to prepare the patient physically for surgery.

Physical Preparation. The degree of preoperative physical preparation depends on the patient's health status and on the surgery to be performed. A seriously ill patient receives more supportive care in the form of medications, IV

fluid therapy, and monitoring than does a patient facing a minor elective procedure. You should explain the purpose of all procedures.

Maintenance of Normal Fluid and Electrolyte Balances. The surgical patient is vulnerable to fluid and electrolyte imbalances as a result of inadequate preoperative intake, excessive fluid losses during surgery, and the physiological effect of third spacing (redistribution of intravascular fluid into interstitial space) in the initial postoperative period (see Chapter 39). A patient traditionally took nothing by mouth (NPO) after midnight on the morning of surgery to keep the stomach empty and thus reduce the risk of vomiting and aspiration. Recommendations for preoperative fasting have been published by the Canadian Anesthesiologists Society (2005) and by the American Society of Anesthesiologists (American Society of Anesthesiologists Task Force on Preoperative Fasting, 1999). They recommended fasting from intake of a light meal (e.g., toast and clear liquids) for six or more hours, and from clear liquids for two to three hours before elective procedures that require general anaesthesia, regional anaesthesia, or sedation.

Agencies vary as to the extent that these guidelines have been adopted. You will remove fluids and solid foods from the patient's bedside and post a sign over the patient's bed to alert hospital personnel and family members about fasting restrictions. The patient may be instructed to take specific medications (e.g., cardiovascular medications, anticonvulsants, or antibiotics) with a sip of water. Although the parameters of preoperative fasting have changed, studies demonstrate that recent guidelines have not been fully implemented and that multidisciplinary improvement processes may be required (O'Callaghan, 2002; Williams, 1999).

A patient who is at home on the evening before surgery must understand the importance of the specific fasting period that has been ordered. You can allow patients to rinse their mouths with water or mouthwash and brush their teeth immediately before surgery as long as they do not swallow water. You must notify the surgeon and anaesthesiologist if the patient has eaten or drunk fluids during the fasting period.

During surgery, normal mechanisms for controlling fluid and electrolyte balances, including respiration, digestion, circulation, and elimination, are disturbed. The surgical procedure may cause extensive losses of blood and other body fluids. The surgical stress response aggravates any fluid and electrolyte imbalances. The patient's preoperative diet should include foods high in protein, with sufficient carbohydrates, fat, and vitamins. If a patient cannot eat because of gastrointestinal alterations or impairments in consciousness, an IV route for fluid replacement is started. The physician assesses serum electrolyte levels to determine the type of IV fluids and electrolyte additives to administer. Patients with severe nutritional imbalances may require supplements containing concentrated protein and glucose (see Chapter 42).

Reduction of Risk of Surgical Wound Infection. The risk of developing a surgical wound infection is determined by the amount and type of microorganisms contaminating a wound, the susceptibility of the host, and the surgical wound itself. All three factors interact to cause infection. Antibiotics may be ordered in the preoperative period. Risk of wound infection decreases when an antibiotic is present in sufficient concentrations at the wound site before incision (Polk & Christmas, 2000). Antibiotics given before surgery may be administered orally or intravenously. Increasingly, antibiotics

are administered in the OR immediately before surgery (Dellinger et al., 1994).

Microorganisms grow and multiply on the skin. Without proper skin preparation, the risk of postoperative wound infection is high. Many surgeons instruct patients to bathe or shower the evening before surgery. Some physicians may request that patients bathe or shower more than once, whereas others may ask patients to give special attention to cleansing the proposed operative site. This attention could include the use of an antibacterial soap. Depending on the surgical procedure, a patient may also shower on the morning of surgery. If the surgical procedure involves the head, neck, or upper chest area, the patient may be required to shampoo his or her hair. Cleansing and trimming of fingernails and toenails also may be necessary.

The need for hair removal is less common now and depends on the amount of hair, the location of the incision, and the surgical procedure planned (AORN, 2002b). Hair removal can damage and cause breaks in the patient's skin, which may allow for the entry of microorganisms. If required, hair is removed with a clipper or shaver as close to the time of surgery as possible. Short hospital stays are known to reduce the chance of a nosocomial (hospital-acquired) infection. Respiratory, urinary tract, and wound infections can all be acquired during hospitalization. This is one advantage of ambulatory surgical procedures, because the patient usually returns home once the surgery has been completed.

Precautions for Patient Requiring Infection Control Procedures. If a patient requires surgery but also has an infectious process, the OR must be notified in advance to ensure appropriate preparation. For example, patients with tuberculosis would be placed in a reverse airflow OR suite and subsequently in a reverse airflow room in the postanesthesia care unit (PACU). Patients with methicillin-resistant *Staphylococcus aureus* (MRSA) may have their surgery performed at the end of the day so that the surgical suite can be cleaned afterward. These patients on transfer to the PACU are placed in an isolation room. Many hospitals now require that all "same-day admit" patients be screened for MRSA and vancomycin-resistant enterococci (VRE).

Prevention of Bowel and Bladder Incontinence. The patient may receive a bowel preparation (e.g., a cathartic or enema) if the surgery involves the lower gastrointestinal system or lower abdominal organs. Manipulation of portions of the gastrointestinal tract during surgery results in absence of peristalsis for 24 hours or longer. Enemas and cathartics, such as GoLYTELY, cleanse the gastrointestinal tract to prevent intraoperative incontinence and postoperative constipation. An empty bowel reduces the risk for injury to the intestines and minimizes contamination of the operative wound if a portion of the bowel is incised or opened accidentally, or if colon surgery is planned (see Chapter 44).

The bladder is not prepared until the morning of surgery.

Promotion of Rest and Comfort. Rest is essential for normal healing. Anxiety about the impending surgery can easily interfere with the patient's ability to relax or sleep. As well, the underlying condition requiring surgery may be painful, further impairing rest.

If the patient is admitted to hospital before the day of surgery, you should attempt to make the patient's environment quiet and comfortable. Sometimes the patient is ordered a sedative-hypnotic or anxiolytic agent for the night before surgery. Sedative-hypnotics (e.g., temazepam [Restoril]) affect

and promote sleep. Anxiolytic agents (e.g., alprazolam [Xanax]) act on the cerebral cortex and limbic system to relieve anxiety.

An advantage of ambulatory surgery or same-day surgical admissions is that the patient is able to sleep at home the night before surgery. He or she is likely to get more rest in a familiar environment. The nonhospitalized patient also may have medication ordered by the physician if apprehension about surgery interferes with a good night's rest.

Preparation on the Day of Surgery. You must complete a number of interventions before releasing the patient for surgery.

Hygiene. Basic hygiene measures provide additional comfort before surgery. The patient may want to bathe before surgery. Because the patient cannot wear personal nightwear to the OR, you must provide a clean hospital gown. If the patient has been NPO for the last several hours, his or her mouth may be very dry. You may offer the patient mouthwash and toothpaste, again with the caution not to swallow any water.

Hair and Cosmetics. During surgery with general anesthesia, the patient's head is positioned to introduce an endotracheal tube into the airway (see Chapter 38). This procedure may involve manipulation of the patient's hair and scalp. To avoid injury, ask the patient to remove hairpins or clips before leaving for surgery. Hairpieces or wigs also should be removed. Long hair can be braided. The patient will wear a disposable hat before entering the OR.

During and after surgery, the anaesthesiologist and nurses will assess skin and mucous membranes to determine the patient's level of oxygenation and circulation. Therefore, all makeup (lipstick, powder, blush, nail polish) should be removed to expose normal skin and nail colouring. Pulse oximetry is capable of recording accurate measurements through most nail polish colours, but removal is still considered good practice. Contact lenses, false eyelashes, and eye makeup also must be removed. The patient's glasses can be stored or given to the family immediately before the patient enters the OR.

Removal of Prostheses. It is easy for any type of prosthetic device to become lost or damaged during surgery. The patient must remove all prostheses, including partial or complete dentures, artificial limbs, artificial eyes, and hearing aids. If a patient has a brace or a splint, check with the physician to determine whether it should remain with the patient.

Many patients are embarrassed at having to remove dentures, wigs, or other devices that enhance their personal appearance. Privacy should be offered as these personal items are removed. Patients may be allowed to keep personal items until they reach the preoperative area. For safekeeping, dentures must be placed in special containers labelled with the patient's name and other identification required by the agency. In many institutions, nurses must make an inventory of all prosthetic devices or personal items and lock them away according to agency policy. It is also common practice for nurses to give prostheses to family members or to keep items like dentures at the patient's bedside. Documentation in the nursing notes, the surgical checklist, or per agency policy should reflect these actions.

Safeguarding Valuables. If a patient has any valuables, you should give them to family members or secure them for safekeeping. Many hospitals require patients to sign a release form that frees the institution of responsibility for any lost valuables. Valuables usually can be stored and locked in a

designated location. Often patients are reluctant to remove wedding rings or religious medals. A wedding band can be taped in place. However, if there is a risk that the patient will experience swelling of the hand or fingers (related to mastectomy, hand surgery, or fluid shifts), the wedding band should be removed. Many hospitals allow patients to pin religious medals to their gowns, although the risk of loss increases with this practice. For safety, other metal items, such as for pierced areas, should also be removed. The location of valuables is documented per hospital policy.

Preparing the Bowel and Bladder. The patient may require an enema or cathartic on the morning of surgery to ensure that the colon is empty. If so, it should be given at least one hour before the patient is scheduled to leave for surgery, allowing time for the patient to defecate without rushing. You should instruct the patient to void just before leaving for the OR and before giving preoperative medications. An empty bladder prevents a patient from becoming incontinent during surgery. This is important during abdominal surgery, when it may be necessary for the surgeon to manipulate the bladder. An empty bladder also makes abdominal organs more accessible during surgery. The last time of voiding is charted. If the patient is unable to void, this should be noted on the preoperative (preprocedure) checklist. An in-dwelling urinary catheter may be placed if the surgery is long or the incision will be in the lower abdomen.

Vital Signs. You must measure a final preoperative set of vital signs. The anesthesiologist uses these values as a baseline during surgery. If preoperative vital signs are abnormal, surgery may need to be postponed. Notify the physician of any abnormalities before sending the patient to surgery.

Documentation. Before the patient goes to the OR, check the contents of the medical record to ensure that pertinent laboratory results are present. Any abnormal findings in laboratory results, such as low potassium, should be reported. Check consent forms for accuracy of information. A preoperative or preprocedure checklist (Figure 48-5) provides you with guidelines to ensure that nursing interventions are completed. You should also check the nursing notes to ensure that documentation of care is current. This is especially important if the hospitalized patient experienced unpredicted problems on the night before surgery. The OR should be alerted through notation of any positioning challenges for the patient, such as difficulty flexing knees, or of any sensory impairment.

Performing Special Procedures. A patient's condition may warrant special interventions before surgery. The patient may need IV infusions started or a nasogastric tube inserted before leaving for surgery. These procedures also may be done once the patient is in the preoperative area, but are usually done in the OR.

Administering Preoperative Medications. The advent of ambulatory surgery has reduced the use of preoperative medications. However, the anesthesiologist or surgeon may order preanesthetic drugs ("on-call medications," "pre-ops") to reduce the patient's anxiety, the amount of general anesthesia required, the risk of nausea and vomiting and resultant aspiration, and respiratory tract secretions.

You should provide all nursing care measures before giving the patient preoperative medications at the prescribed time. The consent form needs to be signed before the administration of these medications. In addition, the patient should be helped to void. Because the drugs cause sedation, the patient should not be allowed to leave the bed or stretcher until surgical

personnel arrive to transport him or her to the OR. The patient should be warned to expect drowsiness and a dry mouth.

safety alert Explain to the patient the effects of the preoperative medications. Remind the patient to remain in bed or on the stretcher. Raise the side rails and keep the bed or stretcher in the low position. Place the call light within easy reach of the patient.

Latex Sensitivity or Allergy. As the incidence and prevalence of latex sensitivity and allergy increases, the need to recognize potential sources of latex is critical. The Canadian Society of Hospital Pharmacists (2001) released new guidelines recommending procedures to prevent and treat occupational latex allergies. Guidelines developed through Canadian and American health care organizations are also available for the management of latex allergies and safe latex use in health care facilities (Sussman & Gold, 2004).

The OR and PACU can contain innumerable products that have latex in them. Some common sources are gloves, IV tubing, syringes, and rubber stoppers on bottles and vials. Latex is also present in objects that may be overlooked, such as adhesive tape, disposable electrodes, endotracheal tube cuffs, protection sheets, and ventilator equipment. However, many hospitals have moved to latex-free products. Those most at risk are people with a previous sensitivity to latex or rubber products, people with neural tube defects such as spina bifida, patients with a history of multiple surgeries, health care providers, and those with history of contact dermatitis or atopic immunological reactions (OPANA, 2009). Symptoms of a latex reaction can include local effects ranging from urticaria and flat or raised red patches to vesicular, scaling, or bleeding eruptions. Acute dermatitis also may be present. Rhinitis and rhinorrhea are other common symptoms in both mild and severe latex reactions. Immediate hypersensitivity reactions can be life-threatening, with the patient exhibiting focal or generalized urticaria, edema, bronchospasm, and mucous hypersecretion, which can compromise respiratory status. Vasodilatation compounded by increased capillary permeability can lead to circulatory collapse and eventual death. Because the patient may be draped during surgery, any unexplained acute deterioration in a previously healthy patient should be investigated for possible latex allergy (Shoup, 1998).

Protocols exist for patients with a latex allergy or sensitivity. Patients with this allergy are identified preoperatively. Latex-free kits are available; they include latex-free equipment (e.g., a latex-free ambu bag) and follow the patients throughout their hospitalization. Although latex kits are available, the move to latex-free products has decreased their use. A reference binder is kept that indicates supplies, medications, and appropriate care options for latex-sensitive patients. It is recommended that the patient with a latex allergy be scheduled as the first case of the day in the OR (OPANA, 2009). The patient can then be safely accommodated by using appropriate latex-free items during the perioperative period and recovery. Box 48-5 lists precautions for patients with latex sensitivity or allergy.

Surgical Safety Checklist. The World Health Organization (WHO, 2008) has a surgical safety checklist, a tool designed by experts in surgery, anesthesia, and nursing. This tool fosters communication between surgeons and nurses about a patient's condition and risk factors at critical time points: during Sign In, Time Out (Surgical Phase), and Sign Out. This

The Ottawa Hospital ☐ Civic ☐ L'Hôpital d'Ottawa ☐ General ☐ Riverside		PRE PROCEDURE CHECKLIST FEUILLE DE VÉRIFICATION PRÉ-INTERVENTION	
PART-PARTIE 1 To be completed prior to the patient leaving the Nursing Unit. A être remplie avant le départ du patient de l'Unité des soins.			
Patient is-Le(la) patient(e) est: ☐ calm-calme ☐ anxious-anxieux(se) ☐ tearful-en larmes ☐ other-autre:			
CHART REVIEW-RÉVISION DU DOSSIER		CHART REVIEW-RÉVISION DU DOSSIER	
☐ Allergies ☐ Allergy band ☐ Latex allergy Allergies Bracelet d'allergies Allergie au latex		Addressograph plate Plaque d'adressographie	
Caution sheet-Feuille de précaution Civic and Riverside only-seulement		Anesthesia record Fiche d'anesthésie	
Consent completed as per policy Consentement rempli d'après la politique		Medication record/MAR Fiche des médicaments/RAM	
Consult notes/Medical history Notes de consultation/Antécédents médicaux		Nursing History Histoire des soins infirmiers	
		Old chart if required Dossier antérieur si nécessaire	
ASSESSMENT-ÉVALUATION		ASSESSMENT-ÉVALUATION	
Identity bracelet verified-Bracelet d'identité vérifié		Precautions - if yes, check-si oui, cocher: ☐ contact(es) ☐ total(es) ☐ airborne-aériennes ☐ droplet-gouttelettes	
Removed-Enlevé - Medic alert bracelet/necklace-collier		Communication barrier-Conflit de communication	
Teeth-Dents : ☐ capped-couronne ☐ loose-branlante		Interpreter present-Interprète présent	
Removed-Enlevé(s) : ☐ dentures-dentiers ☐ bridge-pont		Skin integrity problem-Problème de l'intégrité de la peau	
☐ glasses-lunettes ☐ contacts-verres de contacts		Site:	
☐ hearing aid-appareil auditif		Surgical implants-Implants chirurgicaux	
☐ jewellery/body piercing-bijoux/perçage corporel		Site:	
Pregnancy possibility-Possibilité de grossesse		Pacemaker/Internal defibrillator Stimulateur cardiaque/Défibrillateur interne	
If yes, physician notified: (Name) Si oui, médecin avisé : (Nom)		Antibiotics ordered-Antibiotiques ordonnés	
☐ Ate-Ingestion de nourriture last-dernière:		Sent to OR with patient-Envoyés au bloc avec patient	
☐ Water-Ingestion d'eau last-dernière:			
☐ Void-Miction last-dernière:		☐ Catheterized-Cathétérisé	
DIAGNOSTIC TESTS ORDERED AND ON CHART EXAMENS DIAGNOSTIQUES DEMANDÉS ET AU DOSSIER		DIAGNOSTIC TESTS ORDERED AND ON CHART EXAMENS DIAGNOSTIQUES DEMANDÉS ET AU DOSSIER	
ECG		Urinalysis-Analyse d'urine	
CBC		Type & Screen-Hémostase et dépistage	
PTT/INR		Autologous-Auto-transfusion-units-unités	
Electrolytes / BUN		Chest X-Ray-Radio pulmonaire	
CARE PLAN DE SOINS			
Is the patient DNR-Est-ce que le(la) patient(e) est NPR : ☐ yes-oui ☐ no-non		Consult done-Consultation terminée ☐ yes-oui ☐ no-non	
If yes contact anesthesiologist for DNR consult-Si oui, avisez l'anesthésiologiste pour une consultation de DNR			
SIGNATURE (Nurse-Infirmière)		Init.	
SIGNATURE (Nurse transferring patient to OR-Infirmière transférant patient au bloc)		DATE	
PART-PARTIE 2 To be completed by OR nurse-A être remplie par l'infirmière du bloc opératoire			
1. ☐ Patient identified-Patient identifié		2. ☐ Patient chart reviewed-Dossier du patient révisé	
3. ☐ Consent checked-Consentement vérifié		4. ☐ Surgical site identified as per policy-Site chirurgical identifié d'après la politique ☐ N/A-S/O	
5. Positional problems-Problèmes de position : ☐ N/A-S/O ☐ Yes-Oui :			
Verbal lab report obtained, physician notified Médecin avisé après l'obtention du rapport de lab		Name-Nom	
CARE PLAN DE SOINS		Time-Heure	
Signature		Date (yyaa-mm-dj)	
Signature		Time-Heure	

ORA 06 (03/2005) Cat: 412550

CHART-DOSSIER

Figure 48-5 Preprocedure checklist. Source: Courtesy of The Ottawa Hospital, Ottawa, ON.

* BOX 48-5

EVIDENCE-INFORMED
PRACTICE GUIDELINE

Latex Precautions

1. Survey the patient care area and remove any products containing latex (e.g., examination gloves, rubber sheets, or blood pressure cuff).
2. Place a latex precautions label on the patient's chart and latex precautions signs on the door to the patient's room and on the transport cart.
3. Use only nonlatex gloves. Order an adequate supply.
4. Review the supplies to be used for the patient and substitute with latex-free supplies as necessary.
5. Review the medications to be administered and verify that they are latex-free. Include the following steps:
 - a. Notify the pharmacy of the need for latex precautions.
 - b. Verify that all prescribed medications are latex-free.
 - c. Place a sign in the area where medications (including mixing solutions) are kept, indicating that the patient is on latex precautions.
 - d. Use latex-free syringes.
6. Review the intravenous supplies to be used and verify that they are latex-free. Include the following steps:
 - a. Use latex-free solutions.
 - b. Use latex-free tubing.
 - c. Use latex-free syringes, including those for patient-controlled analgesia.
 - d. Use latex-free tape.
7. Verify that bedding and support garments are latex-free (e.g., mattress protectors, anti-embolism stockings, and binders).
8. Verify that dressings and tape are latex-free.
9. Notify the family and visitors of the use of latex precautions.
10. Routinely survey the patient care area to verify that latex products are not present (e.g., examination gloves, balloons).
11. Before transfer to another area or agency, notify care providers of the need for latex precautions.
12. Provide education programs about latex allergy to health care providers, patients, and family or caregivers. This education should include the following:
 - a. Definition of latex allergy
 - b. Exposures to latex
 - c. Latex avoidance
 - d. Signs and symptoms of a reaction to latex
 - e. Emergency treatment of a reaction to latex



Sources: Adapted from Sussman, G., & Gold, M. (2004). *Guidelines for the management of latex allergies and safe latex use in health care facilities*. Retrieved from <http://www.accai.org/public/physicians/latex.htm>; and Ontario Perianesthesia Nurses Association (OPANA). (2009). *Management of patients with latex allergies* (pp. 121–123). Dundas, ON: Author.

checklist is endorsed by the Canadian Patient Safety Institute (CPSI) (Canadian Patient Safety Institute, 2009).

Eliminating Wrong Site and Wrong Procedure Surgery. Whenever an invasive surgical procedure is to be performed, you and the surgeon must ensure that the site has been marked by the surgeon (see agency policy). Indelible ink may be used to mark left and right distinction, multiple structures (e.g., fingers), and levels of the spine. You also must verify the patient and the procedure to be performed. In addition, once the patient reaches the OR, he or she is introduced to the surgical team. The patient is asked to describe what

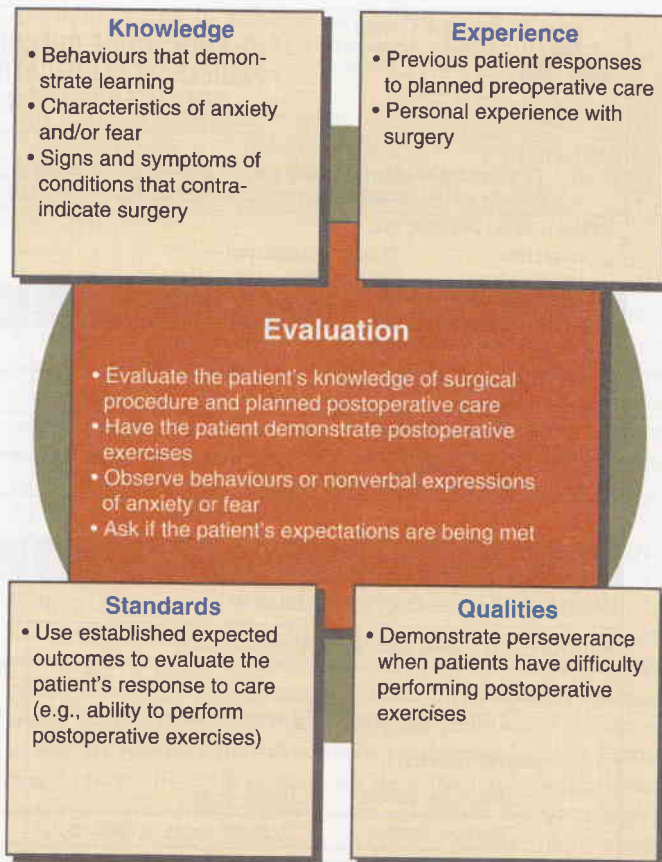


Figure 48-6 Critical thinking model for surgical patient evaluation.

procedure is being performed and to indicate the site for the surgery. The consent form is verified.

❖ Evaluation

Patient Care

The nurse in the preoperative area will be the source for evaluating outcomes during the preoperative period (Figure 48-6). With regard to the preoperative patient's care plan, limited time is available to evaluate the outcomes. The patient's current status is compared with expected outcomes to determine whether new or revised interventions or nursing diagnoses need to be implemented.

Because interventions continue during and after surgery, evaluation of many goals and outcomes do not occur until after surgery. For example, you will not be able to evaluate the success in preventing postoperative wound infection or promoting return of normal physiological function until a few days after surgery. If the patient is having ambulatory surgery, he or she will return home; therefore, the effectiveness of certain interventions is evaluated at follow-up appointments.

Patient Expectations

Determining whether the patient's expectations have been met regarding preoperative teaching may be difficult. You are evaluating the patient in a hurried atmosphere because there are many things that need to be accomplished in a short amount of time. The patient's surgery may be an emergency, or performance of various procedures may make it difficult for you to

find time for evaluation. It is important that you remember to attend to the patient's emotional needs (privacy, fear, anxiety), as well as to his or her physical needs. The patient should be given an opportunity to state whether expectations have been met. If expectations have not been met, you will need to work closely with the patient to redefine expectations that can be realistically met within the time limits imposed by the particular setting.

Transport to the Operating Room

Personnel in the OR notify the nursing division or ambulatory surgery area when it is time for the patient's surgery. In many hospitals, an orderly or transporter brings a stretcher for transporting the patient. The transporter checks the patient's identification bracelet against the patient's chart to ensure that the right person is going to surgery. Because the patient may have received preoperative drugs, the nurses and transporter assist the patient when transferring from bed to stretcher to prevent falls. The ambulatory surgery patient may ambulate to the OR if able to do so and not medicated. Provide the family with an opportunity to visit before the patient is transported to the OR. Then direct the family to a waiting area. In some hospitals, the family may be allowed to wait with the patient in the OR holding area until he or she is transported into the OR.

After the patient leaves the nursing unit, you should prepare the bed and the room for the patient's return, if the patient is returning to the same nursing unit. A postoperative bedside patient area should include the following:

- Sphygmomanometer, stethoscope, and equipment to take a temperature
- Emesis basin
- Clean gown
- Washcloth, towel, and facial tissues
- IV pole and, often, IV pump
- Suction equipment (if needed)
- Oxygen equipment (if needed)
- Extra pillows for positioning the patient comfortably
- Bed pads to protect bed linens from drainage
- Bed raised to stretcher height with bed linens pulled back and furniture moved to accommodate the stretcher and equipment (such as IV lines)

Intraoperative Surgical Phase

Care of the patient during surgery requires careful preparation and knowledge of the events that occur during the surgical procedure. The nurse usually functions in one of two roles in the OR: circulating nurse or scrub nurse. The **circulating nurse** must be a registered nurse. Responsibilities of this nurse include reviewing the preoperative assessment, establishing and implementing the intraoperative care plan, evaluating the care, and providing for continuity of care postoperatively. The circulating nurse assists with procedures, such as endotracheal intubation as needed. In addition, this nurse monitors sterile technique and a safe OR environment, assists the surgeon and surgical team by providing additional supplies, verifying sponge and instrument counts, and maintaining accurate and complete written records.

The **scrub nurse** may be a registered nurse or a registered practical nurse. This nurse maintains a sterile field during the surgical procedure, assists with applying sterile drapes, hands

the surgeons instruments and other sterile supplies, and completes sponge and instrument counts.

Preoperative (Holding) Area

In most hospitals, the patient enters a holding area outside the OR. As the nurse in the holding area, you validate the patient's identification and the location of the surgery. You verify that appropriate data have been obtained, assess a patient's readiness both physically and emotionally, and reinforce teaching (Sullivan, 2000). Nurses in the holding area are members of the OR staff and wear surgical scrub suits, hats, and footwear in accordance with infection control policies. In some ambulatory surgical settings, a perioperative primary nurse admits the patient, circulates for the operative procedure, and manages the patient's recovery and discharge.

In the preoperative area, you or the anaesthesiologist may insert an IV catheter into the patient's arm to establish a route for fluid replacement and IV drugs. A large-bore (18-gauge) IV catheter is used for easy infusion of fluids and blood products if necessary. You also apply a blood pressure cuff. The cuff will remain in place throughout the surgery so that the anaesthesiologist can assess blood pressure readings. You usually review the preoperative checklist, and the anaesthesiologist may perform a patient assessment at this time.

If any preoperative medications have been given, the patient begins to feel drowsy. The temperature in the holding area and adjacent OR suites is usually cool, and the patient should be offered an extra blanket. The patient's stay in the holding area is usually brief.

Admission to the Operating Room

Nurses transfer the patient to the OR via a stretcher. Usually the patient is still awake and will notice nurses and physicians wearing complete surgical masks, gowns, and eyewear. The staff carefully transfers the patient to the OR table, after ensuring that the stretcher and table are locked in place. After the patient is on the table, fasten a safety strap around the patient. Support the patient by explaining procedures and encouraging the patient to ask questions. Sights and sounds in the surgical suite can seem frightening to patients.

The Nursing Process in the Intraoperative Surgical Phase

◆ Assessment

In the holding area, conduct a focused preoperative assessment to verify that the patient is ready for surgery and to plan intraoperative care. Because patients will not be able to speak for themselves while under general anaesthesia, this preoperative assessment in the OR is important for the patient's safety.

safety alert Verification of the patient's name by patient response compared with chart and ID bracelet is completed before sedation. The chart is reviewed for consent forms, allergies, medical history, physical assessment findings, test results, and verification of preoperative medications. You verify with the patient the planned surgical procedure and the surgical site before anaesthesia is administered. Some agencies ask the patient to mark the surgical site. You ensure that the patient's prosthetic devices and valuables have been removed.

You review the preoperative care plan to establish an intraoperative care plan and assess the patient's psychological comfort.

❖Nursing Diagnosis

You review preoperative nursing diagnoses and modify them to individualize the care plan in the OR.

❖Planning

Goals and Outcomes

Patient-centred outcomes of preoperative care extend into the intraoperative phase. For example, one goal would be to maintain skin integrity. An expected outcome would be that the patient will have intact skin and show no signs of redness.

❖Implementation

A primary focus of intraoperative care is to prevent injury and complications related to anaesthesia, surgery, positioning, and equipment used. The perioperative nurse serves as an advocate for the patient during surgery and protects the patient's dignity and rights at all times.

Physical Preparation. After safely securing the patient on the OR table, apply monitoring devices to the patient before surgery. Patients receiving general and regional anaesthesia undergo continuous ECG monitoring during surgery. Small plastic electrodes are placed on the chest and extremities to record electrical activity of the heart. A monitor in the OR displays the heart's electrical activity. Pulse oximetry will be used to monitor oxygen saturation. An electrical cautery grounding pad is applied to the skin. **Antiembolism stockings** or **sequential compression devices** may be applied intraoperatively (especially during long surgeries) or postoperatively according to agency policy (see Chapter 45). Document device application and patient tolerance to procedures.

Introduction of Anaesthesia. Patients undergoing surgical procedures receive one of four types of anaesthesia: general, regional, local, or conscious sedation.

General Anaesthesia. Modern anaesthetic agents are much easier to reverse and allow the patient to recover with fewer untoward effects. **General anaesthesia** results in an immobile, quiet patient who does not recall the surgical procedure. The patient's amnesia acts as protection from the unpleasant surgical events. An anaesthesiologist gives general anaesthetics by IV and inhalation routes through the three phases of anaesthesia: induction, maintenance, and emergence. Surgery that requires general anaesthesia involves major procedures with extensive tissue manipulation or the desire for analgesia, muscle relaxation, immobility, and control of the autonomic nervous system.

Induction includes the administration of anaesthetic agents and endotracheal intubation. The maintenance phase includes positioning the patient, preparing the skin for incision, and the surgical procedure itself. Appropriate levels of anaesthesia are maintained during this phase. During emergence, anaesthetics are decreased and the patient begins to awaken. Because of the short half-life of current medications, emergence often begins to occur in the OR.

The duration of anaesthesia depends on the length of surgery. The greatest risks from general anaesthesia are the side effects of anaesthetic agents, including cardiovascular

depression or irritability, respiratory depression, and liver and kidney damage.

Regional Anaesthesia. Induction of **regional anaesthesia** results in loss of sensation in an area of the body. The method of induction influences the portion of sensory pathways that are anaesthetized. No loss of consciousness occurs with regional anaesthesia, but the patient may be sedated. The anaesthesiologist gives regional anaesthetics by infiltration and local application. Administration techniques include nerve blocks, intrathecal (spinal) or epidural anaesthesia, and IV regional anaesthesia. With epidural anaesthesia, a spinal needle is progressed into the epidural space, while with intrathecal anaesthesia, it is into the subarachnoid space. Both epidural and intrathecal anaesthesia affect motor, sensory, and sympathetic nerves. With intrathecal, the onset of anaesthesia is faster and the amount of medication required is much less than with epidural anaesthesia.

Infiltrative anaesthetics do involve risks, particularly in the case of intrathecal (spinal) anaesthesia. Because the level of anaesthesia may rise, which means that the anaesthetic agent moves upward in the spinal cord, breathing may be affected. This migration of the anaesthetic agent depends on the drug type, amount, and patient position. If the level of anaesthesia rises, respiratory paralysis may develop, requiring resuscitation. Elevation of the upper body prevents respiratory paralysis. The patient may experience a sudden fall in blood pressure, which results from extensive vasodilation caused by the anaesthetic block to sympathetic vasomotor nerves and pain and motor nerve fibres. The patient requires careful monitoring during and immediately after surgery.

Because the patient is responsive and capable of breathing voluntarily, it is not necessary for the anaesthesiologist to use an endotracheal tube. OR personnel can gain a false sense of security because of the patient's relative alertness. Nurses must remember that burns and other trauma can occur on the anaesthetized part of the body without the patient's being aware of these injuries. Therefore, nurses must observe the position of the extremities and the condition of the skin frequently.

Local Anaesthesia. **Local anaesthesia** involves loss of sensation at the desired site (e.g., a growth on the skin or the cornea of the eye). The anaesthetic agent (e.g., lidocaine) inhibits nerve conduction until the drug diffuses into the body's circulation. It may be injected locally or applied topically. The patient experiences a loss in pain and touch sensation at the site. Local anaesthesia is commonly used for minor procedures performed in ambulatory surgery. Physicians may infiltrate the operative area with local anaesthetics to promote postoperative pain relief. For example, peripheral nerve blocks produce anaesthetic effect both at and distal to the site of injection (Turjanica, 2007).

Conscious Sedation. **Conscious sedation** is routinely used for procedures that do not require complete anaesthesia but rather a depressed level of consciousness. A patient under conscious sedation must independently retain a patent airway and airway reflexes and must be able to respond appropriately to physical and verbal stimuli (Litwack, 1999). Short-acting IV sedatives, such as midazolam, are given.

Advantages of conscious sedation include adequate sedation and reduction of fear and anxiety with minimal risk, amnesia, relief of pain and noxious stimuli, mood alteration, elevation of pain threshold, enhanced patient cooperation, stable vital signs, and rapid recovery. A variety of diagnostic

and therapeutic procedures are appropriate for conscious sedation (burn dressing changes, some cosmetic surgery, pulmonary biopsy and bronchoscopy, colonoscopy, and many others) (Litwack, 1999). Nurses assisting with the administration of local anaesthesia and conscious sedation must demonstrate competency in the care of these patients. Knowledge of anatomy, physiology, cardiac dysrhythmias, procedural complications, and pharmacological principles related to the administration of individual agents is essential. Nurses also must be able to assess, diagnose, and intervene in the event of untoward reactions and demonstrate skill in airway management and oxygen delivery. Resuscitation equipment must be readily available when local anaesthesia or conscious sedation is used (AORN, 2002a).

Positioning the Patient for Surgery. When general anaesthesia is being used, the nursing personnel and surgeon often do not position the patient until the stage of complete relaxation is achieved. The choice of position is usually determined by the surgical approach. Ideally, the patient's position provides good access to the operative site and sustains adequate circulatory and respiratory function. It should not impair neuromuscular structures. The patient's comfort and safety must be considered.

Normal range of joint motion is maintained in an alert person by pain and pressure receptors. If a joint is extended too far, pain stimuli provide a warning that muscle and joint strain is too great. In a patient who is anaesthetized, normal defence mechanisms cannot guard against joint damage, muscle stretch, and strain. The muscles are so relaxed that it is relatively easy to place the patient in a position the individual normally could not assume while awake. The patient then remains in a given position, often for several hours. Although it may be necessary to place a patient in an unusual position, attempt to maintain correct alignment and protect the patient from pressure, abrasion, and other injuries. Attachments to the operating table allow protection and padding of extremities and bony prominences. Positioning should not impede normal movement of the diaphragm or interfere with circulation to body parts. If restraints are necessary, pad the area to be restrained to prevent skin trauma.

Documentation of Intraoperative Care. During the intraoperative phase, the nursing staff continues the preoperative care plan. For example, strict asepsis must be followed to minimize the risk of surgical wound infection. IV fluid infusion and monitoring of urinary and nasogastric output are examples of actions nurses will take to maintain the patient's fluid balance. Throughout the surgical procedure, keep an accurate record of patient care activities and procedures performed by OR personnel. Documentation of intraoperative care provides useful data for the nurse who will care for the patient postoperatively.

❖Evaluation

Interventions implemented during the intraoperative phase are evaluated throughout the surgical procedure.

Patient Care

Nurses perform intraoperative evaluation of the patient. Vital signs and intake and output are monitored continuously. The patient's body temperature is measured during the procedure and on completion of the surgical procedure. The skin is inspected under the grounding pad and at areas where

pressure from positioning may have been exerted. Schoonhoven et al. (2002) conducted research related to the development of pressure ulcers during surgery that lasts more than four hours. Of the 208 patients in their study, 44 developed ulcers in the first two days after surgery. Therefore, careful monitoring and preventive measures must be taken during and after surgery.

Patient Expectations

Nurses should frequently question patients not undergoing general anaesthesia regarding pain, numbness, perceived room temperature, and overall comfort. The circulating nurse provides updates to family members in the waiting room.

Postoperative Surgical Phase

After surgery, a patient's care can become complex as a result of physiological changes that may occur. Patients who have undergone general anaesthesia are more likely to face complications than those who have had only local anaesthesia or conscious sedation. The patient who has had general anaesthesia usually has undergone extensive surgery as well. In contrast, an ambulatory surgical patient who has had local anaesthesia with no sedation and has stable vital signs may be discharged immediately. A patient who has undergone regional or general anaesthesia usually is transferred to the PACU to be stabilized before discharge to the nursing unit or back to the ambulatory surgery area.

To assess a patient's postoperative condition, you must apply critical thinking while relying on information from the preoperative nursing assessment, knowledge regarding the surgical procedure performed, and events occurring during surgery. This information helps you detect any changes and make decisions about the patient's care. A variation from the patient's norm may indicate the onset of surgery-related complications. Along with the anaesthesiologist, the circulating nurse may accompany the patient to the PACU and report to the nurse to provide continuity of care.

A patient's postoperative course involves two phases: the immediate recovery period and postoperative convalescence. For an ambulatory surgical patient, recovery normally lasts only one to two hours, and **convalescence** occurs at home. For a hospitalized patient, recovery may last a few hours, and convalescence occurs in hospital over one or more days, depending on the extent of the surgery and the patient's response to it.

Immediate Postoperative Recovery

Before the patient arrives in the PACU, the PACU nurse obtains data from the surgical team in the OR regarding the patient's general status and the need for special equipment and nursing care. Careful planning allows the nursing staff to consider placement of patients in the PACU. For example, patients who have undergone spinal anaesthesia are aware of their surroundings and may benefit from being in a quieter part of the PACU, away from patients who need frequent monitoring. The patient with a serious infection such as tuberculosis should be isolated from other patients. Standard precautions or routine practices for infection control are used for all patients (see Chapter 32). Nurses must be familiar with agency and professional protocols related to preventing respiratory infection transmission (Ontario Ministry of Health and Long-Term Care, 2004).



Figure 48-7 Postanaesthesia care unit.

When the patient is admitted to the PACU, the PACU personnel notify the patient care area of the patient's arrival. This allows the nursing staff to inform family members. Usually, nurses would advise family members to remain in the designated waiting area so that they can be found when the surgeon arrives to explain the patient's condition. The surgeon is responsible for describing the patient's status, the results of surgery, and any complications that may have been encountered. Nurses can be a valuable resource to the family if complications arose during the operative phase.

When the patient enters the PACU (Figure 48-7), nurses and members of the surgical team confer about the patient's status. The surgical team's report includes a review of anaesthetic agents administered so that nurses can anticipate both how quickly a patient should regain consciousness and his or her analgesic needs. A report on IV fluids or blood products administered during surgery alerts nurses to the patient's fluid and electrolyte balances. The surgeon often reports any special concerns (e.g., whether the patient is at risk for hemorrhaging or infection). The anaesthesiologist discusses whether there were complications during surgery, such as excessive blood loss or cardiac irregularities. Frequently, this report takes place while PACU nurses are admitting the patient. You will attach the patient to monitoring equipment such as the noninvasive blood pressure monitor, ECG monitor, and pulse oximeter. Patients usually receive some form of oxygen in this immediate recovery period. Take vital signs when the patient arrives and confirm these with the surgical team.

After reviewing events in the OR, make a complete assessment of the patient's status. This assessment should be performed rapidly and thoroughly and be targeted to the needs of the postsurgical patient. Standards of perianaesthetic nursing practice, such as those of OPANA (2009), function as a guide for agencies in outlining the urgent nature and components of the admission assessment as well as ongoing monitoring of patient status. A systems approach to assessment is discussed in a later section outlining the nursing process in postoperative care. Nursing care in the PACU focuses on monitoring and maintaining respiratory, circulatory, neurological, and fluid and electrolyte status; assessing wound status; and assessing and managing pain (see "The Nursing Process in Postoperative Care").

TABLE 48-8 Modified Aldrete Score

Parameter	Task	Score
Activity	Able to move four extremities voluntarily or on command	2
	Able to move two extremities voluntarily or on command	1
	Unable to move extremities voluntarily or on command	0
Respiration	Able to breathe deeply and cough freely	2
	Dyspnea or limited breathing	1
	Apneic	0
Blood pressure	$\pm 20\%$ of preanaesthetic level	2
	$\pm 20\%$ – 49% of preanaesthetic level	1
	$\pm 50\%$ of preanaesthetic level	0
Consciousness	Fully awake	2
	Arousable on calling	1
	Not responding	0
Oxygen saturation	SpO ₂ $>94\%$ on room air	2
	Needs O ₂ inhalation to maintain SpO ₂ $>94\%$	1
	SpO ₂ $<94\%$ even with extra O ₂	0
Total		

Adapted from Aldrete, J. A., & Kroulik, D. (1970). A post-anesthetic recovery score. *Anesthesia and Analgesia*, 49, 924–934; and Aldrete, J. A. (1998). Modifications to the post-anesthesia score for use in ambulatory surgery. *Journal of Perianesthesia Nursing*, 13(3), 148.

Discharge From the Postanaesthesia Care Unit

Nurses evaluate readiness for discharge from the PACU by comparing vital sign stability with the preoperative data. Other outcomes for discharge are body temperature control, good ventilatory function, orientation to surroundings, absence of complications, minimal pain and nausea, controlled wound drainage, adequate urine output, and fluid and electrolyte balances. Patients who had more extensive surgery that required anaesthesia of longer duration usually recover more slowly. Many PACU staff use an objective scoring system that helps to delineate when patients may be discharged. The Aldrete score, or the **Postanesthesia Recovery Score (PARS)**, is the most widely used scoring tool (Table 48-8). The patient must receive a composite score of 8 to 10 before discharge from the PACU. Some agencies have modified this scoring system; for example, some remove movement of extremities and add presence of pain, and some agencies require that the patient have a composite score of 10 before discharge from the PACU. If the patient's condition is still poor after two to three hours, the stay in the PACU lengthens or the surgeon may transfer the patient to an intensive care unit.

When the patient is ready to be discharged from the PACU, you may call the nursing unit to report the patient's status, including vital signs, respiratory status, the type of surgery and anaesthesia performed, any complications that occurred during surgery or in the PACU, blood loss, level of consciousness, general physical condition, type and amount of fluids received, and presence of IV lines, drainage tubes, and dressings. You also should review physician orders that require attention. Your report helps the nurse in the acute patient care area to anticipate special patient needs and obtain

necessary equipment. Any outstanding family issues are also addressed.

Orderlies or other personnel, who might include nurses, transport the patient on a stretcher. Usually the PACU nurse does not accompany the patient to the surgical unit, but a verbal report will be given to the acute care nurse reviewing the patient's condition and course of care. Some institutions have policies related to which patients must be accompanied by a nurse, such as those who have experienced recent seizure activity or who have had upper airway surgery. Staff members assist in safely transferring the patient to a bed (see Chapter 35).

Recovery in Ambulatory Surgery

The thoroughness and extent of postoperative recovery care depends on the ambulatory patient's condition, type of surgery, and anaesthesia. There are two phases of postanesthesia recovery. During phase I, you focus on helping the patient safely transition from a totally anaesthetized state to one requiring less acute interventions. After patients become stable and no longer require such intensive monitoring, you transfer them to phase II recovery. During phase II, you focus on continuing the recovery process, addressing the patient's needs, and preparing the patient and family for discharge from phase II (OPANA, 2009).

With new anaesthetic agents and techniques, patients experience a more rapid awakening in the OR (Apfelbaum et al., 2002; Fredman et al., 2002; Saar, 2001). Therefore, some ambulatory surgery patients may bypass phase I. This is known as fast tracking (White et al., 2003). Phase II recovery may consist of a room equipped with medical recliner chairs, side tables, and footrests. Kitchen facilities for preparing light snacks and beverages are usually located in the area, along with bathrooms. Aldrete (1998) has added five more areas of functional assessment for the ambulatory surgery patient, which constitute the **Postanesthesia Recovery Score for Ambulatory Patients (PARSAP)** (Table 48-9). The phase II environment is designed to promote both the patient's and the family's comfort and well-being until discharge. You continue to monitor patients but not at the same intensity as during phase I. In phase II recovery, you initiate postoperative teaching with patients and family members (Box 48-6).

Ambulatory surgical patients are discharged to home when they meet certain criteria. A patient being monitored by PARSAP must achieve a score of 18 or higher before being discharged. An exception may be allowed if the patient was unable to walk or move his or her extremities before surgery (Aldrete, 1998). Postoperative nausea and vomiting may occur once the patient is home even if the symptoms were not present at the time of discharge. Options for therapy include the prophylactic use of the drug ondansetron (an orally disintegrating tablet), transcutaneous acupoint electrical stimulation, or a transdermal scopolamine patch (Gan, 2002).

Written postoperative instructions and prescriptions are reviewed with the patient and the family, and you should ensure that they verbalize understanding of these instructions. The patient is discharged to the care of a responsible adult.

Postoperative Convalescence

Inpatient patients are kept in the PACU until their conditions stabilize; they are then transported to the postoperative nursing unit. Ambulatory surgery patients will return home. Nursing care focuses on returning the patient to a relatively functional

► TABLE 48-9

Expanded Postanaesthetic Recovery Score for Ambulatory Patients

Parameter	Task	Score
Activity	Able to move four extremities voluntarily or on command	2
	Able to move two extremities voluntarily or on command	1
	Unable to move extremities voluntarily or on command	0
Respiration	Able to breathe deeply and cough freely	2
	Dyspnea or limited breathing	1
	Apneic	0
Blood pressure	±20% of preanaesthetic level	2
	±20%–49% of preanaesthetic level	1
	±50% of preanaesthetic level	0
Consciousness	Fully awake	2
	Arousable on calling	1
	Not responding	0
Oxygen saturation	SpO ₂ >94% on room air	2
	Needs O ₂ inhalation to maintain SpO ₂ >94%	1
	SpO ₂ <94% even with extra O ₂	0
Dressing	Dry and clean	2
	Wet but marked and not increasing	1
	Growing area of wetness	0
Pain	Pain-free	2
	Mild pain handled by oral medication	1
	Severe pain requiring parenteral medication	0
Ambulation	Able to stand up and walk straight*	2
	Vertigo when erect	1
	Dizziness when supine	0
Fasting or feeding	Able to drink fluids	2
	Nauseated	1
	Nausea and vomiting	0
Urine output	Has voided	2
	Unable to void but comfortable	1
	Unable to void and uncomfortable	0

Total

Note: Total score must be at least 18 for patient to be discharged to home.
 *May be substituted by Romberg's test, or by picking up 12 clips in one hand.
 Adapted from Aldrete, J. A., & Kroulik, D. (1970). A post-anesthetic recovery score. *Anesthesia and Analgesia*, 49, 924–934; and Aldrete, J. A. (1998). Modifications to the post-anesthesia score for use in ambulatory surgery. *Journal of Perianesthesia Nursing*, 13, 148.

level of wellness as soon as possible. The speed of convalescence depends on the type or extent of surgery, the risk factors involved, and any postoperative complications.

The Nursing Process in Postoperative Care

Nursing care in the PACU focuses on managing pain and monitoring and maintaining respiratory, circulatory, fluid and electrolyte, and neurological status. Other important factors

* BOX 48-6 PATIENT TEACHING

Postoperative Instructions for Ambulatory Surgical Patients

Objectives

- Patient will verbalize resources to contact for assistance.
- Patient will describe signs and symptoms of postoperative problems.
- Patient will list the name and dose of medications to self-administer.
- Patient will describe guidelines related to specific surgery.

Teaching Strategies

- Provide instruction sheet with physician's or nurse's telephone number, surgery centre's number, and follow-up appointment date and time. Allow patient and family to ask questions.
- Explain to family members the signs and symptoms of infection for which to observe.
- Explain name, dose, schedule, and purpose of medications. Provide drug information leaflets.
- Explain activity restrictions, diet progression, and any special wound care related to specific surgery. Provide instruction sheet with clear, focused explanations.

Evaluation

- Ask patient to describe signs indicating potential problems and normal convalescence.
- Ask patient to explain when and how to call health care providers such as the home care nurse.
- Ask patient to recite date for follow-up appointment.
- Ask patient and family members to describe the signs and symptoms of infection.
- Ask patient to verbalize name of drug, dose, and when to take.
- Ask patient to demonstrate proper activity or movement and wound care.



to assess include temperature control, skin and incision or wound status, and genitourinary and gastrointestinal function. However, these factors are not unique to the PACU setting. The nurse in the acute care unit continues to assess these critical factors until the patient's discharge from the acute care facility.

❖ Assessment

After patient assessment upon arrival to the PACU, the nurse repeats evaluation of vital signs and other key observations at least every 15 minutes or more frequently, depending on the patient's condition and unit policy. This assessment usually continues until discharge from the PACU. Once the patient is returned to the surgical unit, the nurse admitting the patient takes vital signs immediately in order to compare them with the PACU findings. Vital sign monitoring in the postoperative nursing unit initially should be at least hourly for four hours and then every four hours, unless complications develop. For some institutions, policy may require that vital signs for the patient on return to the surgical unit should be every 15 minutes for the first hour, then hourly for four hours, and then every four hours. Frequency of assessment should always be based on the patient's current condition, which can change rapidly, especially during the postoperative period.

You thoroughly document your assessment, including vital signs, respiratory status, level of consciousness, condition of

dressings and drains, pain and comfort level, skin warmth and colour, ability to move extremities, IV fluid status, and urinary output measurements. Patient data can be entered on flow sheets, by electronic documentation or written progress notes. The initial findings are a baseline for comparing any postoperative changes.

Once the patient returns to the acute care area, you focus on completing the assessment, meeting the patient's immediate needs, and providing an opportunity for the family to be with the patient. The call light and emesis basin should be within the patient's reach. You can explain the purpose of postoperative procedures or equipment and the patient's status. The family should know that the patient will fall in and out of sleep for most of the rest of the day due to the effects of general anaesthesia and pain medication. The family also should be reminded that frequent assessments are to be expected and that limited sensation and movement in the patient's extremities may remain for a few hours if he or she had intrathecal (spinal) or epidural anaesthesia.

Respiration

Certain anaesthetic agents may cause respiratory depression. Thus, you must be especially alert for shallow, slow breathing and a weak cough. You assess airway patency, respiratory rate, rhythm, depth of ventilation, symmetry of chest wall movement, breath sounds, and colour of mucous membranes. If breathing is unusually shallow, placing a hand near the patient's nose or mouth allows you to feel exhaled air. Pulse oximetry should reflect 92% to 100% saturation. Some agencies now have directives that allow nurses to administer oxygen at 3 L/minute via nasal prongs if the patient has a saturation of less than 92%.

The patient often has an oral or nasal airway (see Chapter 38) inserted in the OR after removal of the endotracheal tube to maintain a patent airway until the patient can protect his or her airway. As the patient awakens in the PACU, he or she will spit out the airway or you will ask him or her to spit it out. The patient's ability to do so signifies the return of a normal gag reflex.

One of your greatest concerns is airway obstruction. A number of factors can contribute to obstruction, including weak pharyngeal or laryngeal muscle tone from anaesthetics; secretions in the pharynx, bronchial tree, or trachea; and laryngeal or subglottic edema (Litwack, 1999). In the postanaesthetic patient, the tongue causes the majority of airway obstructions. Ongoing assessment of airway patency is crucial. Patients are often kept in side-lying positions until airways are clear.

In the acute care area, you continue to assess respiratory status and breath sounds. Older patients, smokers, and patients with a history of respiratory disease are prone to developing complications such as atelectasis or pneumonia. The patient is also assessed for any signs of shortness of breath with activity.

Circulation

The patient is at risk for cardiovascular complications resulting from actual or potential blood loss from the surgical site, side effects of anaesthesia, electrolyte imbalances, and depression of normal circulatory regulating mechanisms. Careful assessment of heart rate and rhythm, along with blood pressure, reveals the patient's cardiovascular status. A rhythm strip is usually obtained postoperatively, compared with any

preoperative ECG tracings, and mounted on the PACU record. The vital signs are monitored at least every 15 minutes throughout the PACU recovery phase. Preoperative vital signs are compared with postoperative values. The physician should be notified if the patient's blood pressure drops progressively with each check or if the heart rate changes or becomes irregular.

You assess circulatory perfusion by noting capillary refill, pulses, and the colour and temperature of the nail beds and skin. If the patient has had vascular surgery or has casts or constricting devices that may impair circulation, you should assess peripheral pulses and capillary refill distal to the site of surgery. For example, after surgery to the femoral artery, you assess posterior tibial and dorsalis pedis pulses. You also compare pulses in the affected extremity with those in the nonaffected extremity.

A common early circulatory problem is hemorrhage. Blood loss may occur externally through a drain or incision, or internally. Either type of hemorrhage may result in a fall in blood pressure; elevated heart and respiratory rates; thready pulse; cool, clammy, pale skin; and restlessness. Often, the first sign of hemorrhage is restlessness. Signs such as thready pulse and clammy skin are noted much later, after significant blood loss has occurred. The surgeon must be notified if these types of changes are noted. You maintain IV fluid infusion and may need to increase IV replacement fluids. Monitor the patient's vital signs every 15 minutes or more frequently until his or her condition stabilizes. Oxygen may need to be continued. Volume replacement and medications to promote perfusion to vital organs such as the brain may be considered. Plasma expanders (colloids) may be used instead of blood transfusions. Colloids may be made from blood products (i.e., albumin), but artificial colloids, such as hetastarch, are also used (Diepenbrock, 2008). Blood counts and coagulation studies are drawn and sent to the laboratory. The potential for cardiovascular complications remains when the patient is transferred to the acute care area. In that area, you continue to assess the same factors that were identified in the PACU.

Temperature Control

The OR and recovery room environments are kept extremely cool. The patient's anaesthetically depressed level of body function results in a lowering of metabolism and a fall in body temperature. When patients begin to awaken, they complain of feeling cold and uncomfortable. The length of time spent in the OR and laminar flow rooms contributes to heat loss. Surgeries that require an open body cavity also contribute to heat loss. Older adults and pediatric patients are at higher risk for developing problems associated with hypothermia.

In rare instances, **malignant hyperthermia**, a genetically determined condition and a life-threatening complication of anaesthesia, develops. Malignant hyperthermia causes tachypnea, tachycardia, premature ventricular contractions, unstable blood pressure, cyanosis, skin mottling, and muscular rigidity. An elevated temperature occurs late. Although it is often seen during the induction phase of anaesthesia, symptoms may recur 24 to 72 hours postoperatively (Karlet, 1998). Without prompt detection and treatment, it can be fatal.

Temperature is monitored closely in the acute care area. Because an elevated temperature may be the first indication of an infection, you evaluate the patient for a potential source of infection, including the IV site (if present), the surgical incision or wound, and the respiratory and urinary tracts.

The physician must be notified, because further evaluation, including blood, sputum, and urinary cultures, likely will be needed. In elderly patients, fever may not be seen with infection (Litwack, 2006).

Fluid and Electrolyte Balances

Because of the surgical patient's risk for fluid and electrolyte abnormalities, you assess the hydration status and monitor cardiac and neurological function for signs of electrolyte alterations (see Chapter 39). Laboratory values will be monitored and compared with the patient's baseline values.

One of your important responsibilities is monitoring the rate and maintaining the patency of IV infusions. The patient's only source of fluid intake immediately after surgery is through IV catheters. You must inspect the catheter insertion site to ensure that the catheter is properly positioned within a vein so that fluid flows freely. Accurate recording of intake and output helps assess renal and circulatory function. You record the intravenous infusions received as well as any sources of oral intake once peristalsis returns. You measure all sources of output, including urine, surgically placed drains, gastric drainage, and drainage from wounds, and note any insensible loss from diaphoresis. Daily weights may be assessed postoperatively if the patient has a known cardiac or renal history (e.g., heart failure). It is important to compare preoperative and postoperative weights and to be consistent in the scale used, the amount of clothing worn by the patient, and the time of day to obtain accurate weight measurement. Accurate recording of intake and output is crucial. It is also important to be aware of the amount of fluids received in the intraoperative and immediate postoperative period. For example, if large amounts of fluid were received during surgery, the patient may exhibit signs of fluid retention such as pedal edema or abnormal breath sounds.

Neurological Functions

The patient is often drowsy in the PACU. As anaesthetic agents are metabolized, the patient's reflexes return, muscle strength is regained, and a normal level of orientation returns. A patient should at least be oriented to self and to the hospital before discharge from the PACU. Assess gag reflexes (see Chapter 31), hand grips, and movement of the patient's extremities. If the patient has had surgery involving a portion of the neurological system, conduct a more thorough neurological assessment, including assessing pupil size and reaction.

Patients who had regional anaesthesia begin to experience a return in motor function before tactile sensation. You check the patient's sensation along **dermatomes** (segmental skin areas innervated by specific segments of the spinal cord). Knowing where anaesthesia was introduced, you are able to check the distribution of the spinal nerves affected (see Chapter 31). Typically, you assess the dermatome level by touching the patient bilaterally and documenting where he or she feels touch. The sense of touch can be tested using a paper clip, for example. Assessment of extremity strength, movement, and sensation continues to be important if spinal or epidural anaesthesia has been given, although the patient should remain in the PACU until sensation and voluntary movement of the lower extremities have been re-established.

Skin Integrity and Condition of the Wound

In the PACU, nurses assess the condition of the patient's skin, noting rashes, petechiae, abrasions, or burns. A rash may

indicate a drug sensitivity or allergy. Abrasions or petechiae may result from a clotting disorder or from inappropriate positioning or restraining that injures skin layers. Burns may indicate that an electrical cautery grounding pad was incorrectly placed on the patient's skin. Burns or serious injury to the skin should be documented in an incident report (see Chapter 15). You should also make a note if the patient complains of any burning or pain in the eye that could indicate a corneal abrasion.

After surgery, most wounds are covered with a dressing that protects the site and collects drainage. You observe the amount, colour, odour, and consistency of drainage on dressings. Serosanguineous drainage is the most common type of drainage occurring immediately after surgery. You estimate the amount of drainage by noting the number of saturated gauze sponges. If drainage appears on the outer surface of a dressing, another way to assess drainage is by drawing a circle around the outer perimeter of the drainage on the dressing and dating it with the time noted. This way, you can easily note if drainage is increasing (see Chapter 46).

The nurse on the surgical nursing unit usually will have the first opportunity to view and thoroughly assess and document the status of the incision or wound. Initially, it is important to note if wound edges are approximated and no active bleeding or drainage is present. The wound needs to be assessed for redness, swelling, signs of infection, and slipped sutures or staples. Wound assessment is especially important because it forms the baseline for continued monitoring during the patient's hospital stay.

It is also important to assess the patient's mobility level. If the patient is unable or unwilling to turn, pressure ulcer development is a concern. You should use the Braden Scale to determine the patient's risk of developing pressure ulcers (RNAO, 2005). Preventive measures such as a turning schedule and pressure-reduction devices can be instituted (see Chapter 46).

Genitourinary Function

Depending on the surgery, a patient may not regain voluntary control over urinary function for six to eight hours after anaesthesia. An epidural or spinal anaesthetic may prevent the patient from feeling bladder fullness. You should palpate the lower abdomen just above the symphysis pubis for bladder distension or you may use a bladder scanner to identify the amount of urine in the bladder. If the patient has a urinary catheter, there should be a continuous flow of urine of 30 to 50 mL/hour in adults (Metheny, 2000). You observe the colour and the odour of the urine. Surgery involving portions of the urinary tract normally causes bloody urine for at least 12 to 24 hours, depending on the type of surgery. You will provide ongoing assessment of genitourinary function.

Gastrointestinal Function

Anaesthetics slow gastrointestinal motility and may cause nausea. Normally during the immediate recovery phase, faint or absent bowel sounds are auscultated in all four quadrants. You inspect the abdomen for distension that may be caused by an accumulation of gas. In a patient who has had abdominal surgery, distension will develop if internal bleeding occurs; however, this is a late sign of bleeding. Distension also may occur in the patient who develops a **paralytic ileus** as a result of handling of the bowel in surgery.

You closely monitor the patient's initial oral intake for potential aspiration or the presence of nausea and vomiting.

Assessment also includes checking every four to eight hours for return of peristalsis. Routinely, you auscultate the abdomen to detect return of normal bowel sounds; 5 to 30 loud gurgles per minute over each quadrant indicates that peristalsis has returned. High-pitched tinkling sounds accompanied by abdominal distension suggest that the bowel is not functioning properly. You should ask if the patient is passing gas (flatus). This is an important sign indicating normal bowel function. If a nasogastric tube is in place, assess the patency of the tube (see Chapter 44), the colour and amount of any drainage, and (if ordered) the level of suction required.

Pain and Comfort

Pain management is included in the overall aim of ensuring patient comfort. Comfort is also achieved through nursing measures such as bathing and providing clean bedding. As patients awaken from general anaesthesia, the sensation of pain becomes prominent. Pain can be perceived before full consciousness is regained. Acute incisional pain causes patients to become restless and may be responsible for temporary changes in vital signs. It is difficult for patients to begin coughing and undertaking deep breathing exercises when they experience pain. The patient who had regional or local anaesthesia may not experience pain initially because the incisional area is still anaesthetized.

Assessment of the patient's discomfort and evaluation of pain-relief therapies are essential nursing functions. Pain scales are an effective method for nurses to assess postoperative pain, evaluate response to analgesics, and objectively document pain severity (see Chapter 41). By frequently assessing pain, you can evaluate the effectiveness of interventions (e.g., positioning, analgesics) throughout the patient's recovery.

Patient Expectations

The nurse assesses the patient's and family's expectations and perceived progress in the recovery and convalescence phases. Ongoing assessment of expectations regarding pain control, comfort level, dietary intake, activity level, and readiness for discharge are also performed. You determine the patient's and the family's expectations regarding needs at home and incorporate these into the care plan.

❖Nursing Diagnosis

You determine the status of problems identified from preoperative nursing diagnoses, and cluster new relevant data to identify new diagnoses. Previously defined diagnoses, such as *impaired skin integrity*, may continue as a postoperative problem. You may identify new risk factors leading to identification of nursing diagnoses. For example, an older patient who has undergone major abdominal surgery and who has a preexisting problem of reduced hip mobility resulting from arthritis will likely have the diagnosis of *impaired physical mobility*. The surgery itself may add risk factors for the patient. You also consider the needs of a patient's family when making diagnoses. For example, the inability of the family to cope with the patient's condition requires your intervention. Early dialogue with the family can identify any challenges.

❖Planning

Because of the critical nature of the immediate postoperative period, the care plan in the PACU involves close monitoring

of the patient and frequent assessments to ensure a return to stable physiological function. During the convalescent phase, you use current physical assessment data and analysis of the preoperative nursing health history for planning the patient's care. The surgeon's postoperative plan and the institution's clinical pathways are also guidelines. Typical postoperative plans include the following:

- Frequency of vital sign monitoring and other assessments such as oxygen saturation
- Types of IV fluids and rates of infusion
- Postoperative medications (especially those for pain and nausea)
- Resumption of preoperative medications as condition allows (some oral medications will be converted to the IV route with appropriate dose adjustment)
- Fluids and food allowed by mouth
- Level of activity that the patient is allowed to resume
- Position that the patient is to maintain while in bed
- Intake and output
- Laboratory tests and X-ray studies
- Special directions (e.g., surgical drains to suction, tube irrigations, dressing changes)
- Patient teaching and discharge planning

Goals and Outcomes. You consider the effects of the stress of surgery and the limitations it produces when establishing goals, patient outcomes, and nursing interventions for the patient. Measurable outcomes with indicators help to ensure timely and appropriate recovery from surgery. For example, the patient at risk for impaired physical mobility should have specific outcomes that include targeted ambulation (e.g., steps to take and distance down hallway) and range of joint movement. After each outcome is met, the patient ultimately will achieve the goal of independent mobility at a preoperative level or better. You carefully consider all goals of care established during the preoperative surgical phase. The following is an example of goals and outcomes for the postoperative period:

- Patient achieves a return of normal physiological function after surgery.
- Patient's vital signs return to preoperative baseline.
- Patient's airway is patent and respirations are even and unlaboured.
- Patient's temperature returns to baseline. Patient's fluid and electrolyte levels remain balanced.
- Patient verbalizes feeling of increased strength and ability to move.

Setting Priorities

In the PACU, priorities of care include the assessment and stability of the patient's airway; intervention for an impaired airway; assessment of the patient's respiratory, circulatory, neurological, and fluid and electrolyte status; and pain control. As the patient progresses on the acute care unit, priorities should focus on advancement of patient activity to return the patient to preoperative functioning or better. The patient generally will have multiple nursing diagnoses. You may re-establish priorities several times as the patient's health status changes.

Continuity of Care

In the recovery phase, you collaborate on the care plan with staff from respiratory therapy, physiotherapy, occupational therapy, dietary, social work, home care, and other areas to

meet the patient's needs. The goal of all these disciplines is to assist the patient to return to the best possible level of functioning with a smooth transition to home. The family's role in the care plan to foster recovery is also essential.

Implementation

Health Promotion

Primary causes of postoperative complications include the surgical wound, the effects of prolonged immobilization during surgery and convalescence, preoperative risks such as age (Box 48-7), and the influence of anaesthesia and analgesics. Nursing interventions in the postoperative period are directed at preventing complications so that the patient returns to the highest level of functioning possible. Failure of the patient to become actively involved in recovery adds to the risk for complications (Table 48-10). Virtually any body system can be affected. You must consider the interrelationship of all systems and therapies provided.

Maintaining Respiratory Function. To prevent respiratory complications, begin pulmonary interventions early.

* BOX 48-7 FOCUS ON OLDER ADULTS

- Age alone is no longer a parameter for determining the benefit one can achieve from a surgical procedure. Consequently, nurses are caring for many more surgical patients of advanced age and are required to know the age-related factors that affect a surgical procedure (Eliopoulos, 2001).
- Hypothermia and postoperative embolism may be seen in older adults (Clayton, 2008).
- A smaller margin of physiological reserve makes the older adult less able to compensate during the perioperative period for changes that can occur due to infection, hemorrhage, alterations in blood pressure, and fluid and electrolyte abnormalities.
- Older patients are at greater risk for postoperative delirium after procedures such as hip replacement and cardiac surgery (OPANA, 2009). A rapid decline in cognitive function, fluctuations in awareness and orientation, disturbed sleep-wake cycle, and personality and mood changes characterize the typical presentation (Lueckenotte, 2000). Delirium may be the first indicator of infection, fluid or electrolyte imbalances, or deteriorating respiratory or hemodynamic status. The onset of delirium can result in loss of independence, increased morbidity and mortality, and increased health care costs (Inouye, 2006).
- Altered and unexpected drug responses are often related to different pharmacokinetics in the older adult. Thus, when caring for the perioperative older patient, you must be alert to the possibility of a high risk for adverse medication events with the administration of anaesthetic agents and postoperative analgesics, especially narcotics (Lueckenotte, 2000). "Start lower and go slow" should be the guiding principle when medicating older adults because of their slower drug-clearance capability.



Sources: Data from Eliopoulos, C. (2001). *Gerontologic nursing* (5th ed.). Philadelphia, PA: Lippincott; Lueckenotte, A. G. (2000). *Gerontologic nursing* (2nd ed.). St Louis, MO: Mosby; Clayton, J. L. (2008). Special needs of older adults undergoing surgery. *AORN Journal*, 87(3), 557-570; and Registered Nurses' Association of Ontario (RNAO). (2002a). *Assessment and management of pain*. Retrieved from <http://www.rnao.org/Page.asp?PageID=924&ContentID=720>.

► TABLE 48-10 Postoperative Complications

Complication	Cause
Respiratory System	
<i>Atelectasis:</i> Collapse of alveoli with retained mucous secretions. Signs and symptoms include elevated respiratory rate, dyspnea, fever, crackles auscultated over involved lobes of lungs, and productive cough.	Inadequate lung expansion. Anaesthesia, analgesia, and immobilized position prevent full lung expansion. There is greater risk in patients with upper abdominal surgery who have pain during inspiration and repress deep breathing. Poor lung expansion with retained secretions or aspirated secretions.
<i>Pneumonia:</i> Inflammation of alveoli. It may involve one or several lobes of lung. Development in lower dependent lobes of lung is common in immobilized surgical patient. Signs and symptoms include fever, chills, productive cough, chest pain, purulent mucus, and dyspnea.	
<i>Hypoxemia:</i> Inadequate concentration of oxygen in arterial blood. Signs and symptoms include restlessness, dyspnea, high or low blood pressure, tachycardia or bradycardia, diaphoresis, and cyanosis.	Respirations are depressed by anaesthetics or analgesics. Increased retention of mucus with impaired ventilation occurs because of pain or poor positioning.
<i>Pulmonary embolism:</i> Embolus blocking pulmonary arterial blood flow to one or more lobes of lung. Signs and symptoms include dyspnea, sudden chest pain, cyanosis, tachycardia, and drop in blood pressure.	Same factors lead to formation of thrombus or embolus. Immobilized surgical patient with preexisting circulatory or coagulation disorders is at risk.
Circulatory System	
<i>Hemorrhage:</i> Loss of large amount of blood externally or internally in short period of time. Signs and symptoms include hypotension, weak and rapid pulse, cool and clammy skin, rapid breathing, restlessness, and reduced urine output.	Slipping of suture or dislodged clot at incisional site. Patients with coagulation disorders are at greater risk.
<i>Hypovolemic shock:</i> Inadequate perfusion of tissues and cells from loss of circulatory fluid volume. Signs and symptoms are same as for hemorrhage.	In surgical patient, hypovolemic shock is usually caused by hemorrhage.
<i>Thrombophlebitis:</i> Inflammation of vein often accompanied by clot formation. Veins in legs are most commonly affected. Signs and symptoms include swelling and inflammation of involved site and aching or cramping pain. Vein feels hard, cordlike, and sensitive to touch.	Venous stasis is aggravated by prolonged sitting or immobilization. Trauma to vessel wall and hypercoagulability of blood increase risk of vessel inflammation.
<i>Thrombus:</i> Formation of clot attached to interior wall of a vein or artery, which can occlude the vessel lumen. Signs and symptoms include localized tenderness along distribution of the venous system, swollen calf or thigh, calf swelling more than 3 cm compared with asymptomatic leg, pitting edema in symptomatic leg, collateral superficial veins, and decrease in pulse below location of thrombus (if arterial).	Venous stasis (see discussion of thrombophlebitis) and vessel trauma. Venous injury is common after surgery of legs, abdomen, pelvis, and major vessels. Patients with pelvic and abdominal cancer or traumatic injuries to the pelvis or lower extremities are at high risk for thrombus formation.
<i>Embolus:</i> Piece of thrombus that has dislodged and circulates in bloodstream until it lodges in another vessel, commonly lungs, heart, brain, or mesentery.	Thrombi form with increased coagulability of blood (e.g., polycythemia and use of birth control pills containing estrogen).
Gastrointestinal System	
<i>Paralytic ileus:</i> Nonmechanical obstruction of the bowel caused by physiological, neurogenic, or chemical imbalance associated with decreased peristalsis.	Handling of intestines during surgery can lead to loss of peristalsis for a few hours to several days.
<i>Abdominal distension:</i> Retention of air within intestines and abdominal cavity during gastrointestinal surgery. Signs and symptoms include increased abdominal girth, tympanic percussion over abdominal quadrants, and patient complaints of fullness, "gas pains," and referred shoulder pain.	Slowed peristalsis from anaesthesia, bowel manipulation, or immobilization. During laparoscopic surgeries, influx of air for procedure causes distension.
<i>Nausea and vomiting:</i> Symptoms of improper gastric emptying or chemical stimulation of vomiting centre. Patient complains of gagging or feeling full or sick to stomach.	Abdominal distension, fear, severe pain, medications, eating or drinking before peristalsis returns, and initiation of gag reflex.
Genitourinary System	
<i>Urinary retention:</i> Involuntary accumulation of urine in bladder as a result of loss of muscle tone. Signs and symptoms include inability to void, restlessness, and bladder distension. It appears six to eight hours after surgery.	Effects of anaesthesia and narcotic analgesics. Local manipulation of tissues surrounding bladder and edema interfere with bladder tone. Poor positioning of patient impairs voiding reflexes.
<i>Urinary tract infection:</i> An infection of the urinary tract as a result of bacterial or yeast contamination. Signs and symptoms include dysuria, itching, abdominal pain, possible fever, cloudy urine, white blood cells, and leukocyte esterase positive on urinalysis.	Most frequently a result of catheterization of the bladder.

► TABLE 48-10 Postoperative Complications—cont'd

Complication**Integumentary System**

Wound infection: An invasion of deep or superficial wound tissues by pathogenic microorganisms. Signs and symptoms include warm, red, and tender skin around incision; fever and chills; and purulent material exiting from drains or from separated wound edges. Infection usually appears three to six days after surgery.

Wound dehiscence: Separation of wound edges at suture line. Signs and symptoms include increased drainage and appearance of underlying tissues. This usually occurs six to eight days after surgery.

Wound evisceration: Protrusion of internal organs and tissues through incision. Incidence usually occurs six to eight days after surgery.

Skin breakdown: Result of pressure or shearing forces. Surgical patients are at increased risk if alterations in nutrition and circulation are present, resulting in edema and delayed healing.

Cause

Infection is caused by poor aseptic technique or contaminated wound or surgical site before surgical exploration. For example, with a bowel perforation, the patient is at increased risk for a wound infection because of bacterial contamination from the large intestine.

Malnutrition, obesity, preoperative radiation to surgical site, old age, poor circulation to tissues, and unusual strain on suture line from coughing or positioning cause dehiscence. See discussion of wound dehiscence. Patient with dehiscence is at risk for developing evisceration.

Prolonged periods on the operating room (OR) table and in the bed postoperatively can lead to pressure breakdown. Skin breakdown results from shearing during positioning on the OR table and improper pulling of the patient up in bed.

Nervous System

Complex pain situations: These might include situations in which pain is unresponsive to standard treatment or where there are multiple sources of pain (RNAO, 2002a).

The source may be related to, for example, surgical site or concomitant injuries or pathology.

The benefits of thorough preoperative teaching are realized when patients are able to participate actively. When the patient awakens from anaesthesia, you may need to assist him or her in maintaining a patent airway. The following measures maintain airway patency:

- Position the patient on one side with the face downward and the neck slightly extended to facilitate a forward movement of the tongue and the flow of mucous secretions out of the mouth. A small folded towel supports the head. Another positioning technique to promote a patent airway involves slightly elevating the head of the bed and slightly extending the patient's neck, with the head turned to the side. The PACU nurse may need to perform a jaw thrust manoeuvre or chin lift continuously to maintain the airway in some patients. Never position the patient with arms over or across the chest because this reduces maximum chest expansion.
- Suction artificial airways and the oral cavity for mucous secretions (see Chapter 38). Care must be taken to avoid eliciting the gag reflex, which could cause vomiting. The following measures promote expansion of the lungs:
- Encourage diaphragmatic breathing exercises every hour while patients are awake. Maximal inspirations lasting three to five seconds open up alveoli.
- Instruct patients to use an incentive spirometer (if used in your hospital). The patient should try to reach the inspiratory volume achieved preoperatively on the spirometer.
- Encourage early ambulation. Walking causes patients to assume a position that does not restrict chest wall expansion and stimulates an increased respiratory rate.
- Help patients who are restricted to bed to turn on their sides every one to two hours while awake and to sit when possible. Turning permits expansion of the lungs. Sitting causes lowering of abdominal organs, thus facilitating diaphragmatic movement and lung expansion.
- Keep the patient comfortable. A patient who is comfortable will be able to participate in the postoperative regimen.

Assess, document, treat, and evaluate the patient's pain on a regular basis.

The following measures promote removal of pulmonary secretions if they are present:

- Encourage coughing exercises every two hours while patients are awake, and maintain pain control to promote a deep, productive cough. Coughing may be contraindicated for patients who have had eye or intracranial surgery because of the potential increase in intraocular or intracranial pressure.
- Provide oral hygiene to facilitate expectoration of mucus. The oral mucosa becomes dry when patients are NPO or are placed on limited fluid intake.
- Initiate orotracheal or nasotracheal suction for patients who are too weak or unable to cough (see Chapter 38).
- Administer oxygen as ordered and monitor oxygen saturation with a pulse oximeter.

Preventing Circulatory Complications.

- Measures directed at preventing circulatory complications avert circulatory stasis. Some patients are at greater risk of venous stasis because of the nature of their surgery or medical history. The following measures promote normal venous return and circulatory blood flow:
- Encourage patients to perform leg exercises at least every hour while awake. Exercise may be limited in an affected extremity involving vascular repair or realignment of fractured bones and torn cartilage.
- Apply elastic antiembolism stockings or sequential compression stockings as ordered by the physician (see Chapter 45). The antiembolism stockings should be removed at least once per shift. Perform a thorough assessment of the skin of the lower extremities at this time.
- Encourage early ambulation. Some patients are expected to ambulate on the evening of surgery, depending on the severity of the surgery and their condition. Even if a patient has an epidural catheter or a PCA device, ambulation should be encouraged. The degree of activity allowed

progresses as the condition improves. Before ambulation, you should assess the patient's vital signs. Abnormalities may contraindicate ambulation. If vital signs are at baseline, you first help the patient to sit on the side of the bed. Patient complaints of dizziness are a sign of postural hypotension. Rechecking the patient's blood pressure will help you to determine whether ambulation is safe. You assist with ambulation by standing at the patient's side and ensuring that he or she can stand safely and walk steadily. The first few times out of bed, patients may be able to walk only a few metres. This should improve each time. Evaluate tolerance to activity by periodically assessing the pulse rate as the patient ambulates.

- Avoid positioning patients in a manner that interrupts blood flow to their extremities. While in bed, patients should not have pillows or rolled blankets placed under their knees. Compression of the popliteal vessels can cause thrombi. When patients sit in chairs, their legs should be elevated on footstools. A patient should never be allowed to sit with one leg crossed over the other.
- Administer anticoagulant drugs as required. Physicians often order prophylactic doses of anticoagulants, such as heparin or Fragmin (dalteparin), for patients at greatest risk for thrombus formation.
- Promote adequate fluid intake. Adequate hydration prevents concentrated buildup of formed blood elements, such as platelets and red blood cells. When the plasma volume is low, these elements may gather and form small clots within blood vessels.

Achieving Rest and Comfort. A surgical patient's pain increases as the effects of anaesthesia diminish. The patient becomes more aware of the surroundings and more perceptive of discomfort. The incisional area may be only one source of pain. Irritation from **abdominal gas**, drainage tubes, tight dressings or casts, and the muscular strains caused from positioning on the OR table can cause discomfort.

It is common to administer narcotic analgesics immediately after surgery. Initial analgesic doses are usually given by IV infusion in the PACU and titrated to patient comfort. After an anaesthetized patient is awake and aware, PCA may be used. This is given by IV or subcutaneous infusion or via an epidural, often with Dilaudid or morphine. The PCA system allows patients to administer their own analgesics from a specially prepared pump (see Chapter 41). If patients are able to gain a sense of control over their pain, they usually have fewer postoperative problems. Gagliese et al. (2000) found that both young and older adult surgical patients were able to use PCA to attain adequate levels of pain relief. Many patients receive epidural analgesia that may be continued during the recovery period (see Chapter 41). Increasingly, patients are being prescribed more a combination of opioid and nonopioid analgesics in an effort to decrease opioid-related side effects (White, 2008) in the postoperative period. As soon as peristalsis returns, patients may be given a combination of acetaminophen and a nonsteroidal anti-inflammatory.

In the acute care area, you continue pain assessment and determine the effectiveness of interventions. Patients who will have PCA after surgery should be taught how to push the button when they begin to feel pain and they should understand that use of PCA will not cause them to overmedicate. Patients should be taught to administer PCA prior to activities that may increase pain, such as mobilization. If the patient has a PCA system and is trying to use it more frequently than

the amount programmed, you should investigate his or her pain further and contact the physician or the advanced practice nurse on the acute pain service to increase, for example, the amount of medication received. PCA provides you with a useful monitor of the effectiveness of pain medication. As oral intake is tolerated, you facilitate changing the patient's pain medication from IV to oral administration. It is important to ensure adequate pain coverage when the patient is switched from an IV to an oral route (Snell et al., 1997). Sometimes patients are given a subcutaneous injection of analgesia before transfer to the acute care area to ensure pain control over this time period. Intramuscular injections of analgesics are seldom used now. The importance of nonpharmacological interventions should not be overlooked. You should assess which care measures may contribute to pain and use nonpharmacological measures to treat it. An example would be to lower the head of the bed and use a pillow for incisional splinting while turning a patient with recent abdominal surgery. You can also use other methods of promoting pain relief, such as positioning, back rubs, distraction, or imagery. Ice packs may be ordered for patients undergoing joint replacement. Pain can slow recovery significantly. The patient becomes reluctant to cough, breathe deeply, turn, ambulate, or perform necessary exercises. You should assess the patient's pain thoroughly (see Chapter 41). You should not assume that the pain is only incisional. When the patient asks for pain medication, determine the location, intensity, and character of the pain. During the first 24 to 48 hours after surgery, you should provide analgesics on a regular basis around the clock to improve pain control (Agency for Health Care Research and Policy, 2002; RNAO, 2002a). If pain medications are not relieving discomfort, you should notify the physician or the acute pain service after completing a thorough assessment. Recognizing the potential complications of analgesics and knowing what to do if they occur is an important role of the postoperative nurse.

Acute Care

Temperature Regulation. Temperature regulation is important in the postoperative period. Patients are often cool after surgery, and the PACU nurse provides warmed blankets in the immediate postoperative period. If the patient's temperature is 35.6°C or below, a warming device such as the Bair Hugger may be used. Increasing body warmth causes the patient's metabolism to rise and circulatory and respiratory functions to improve.

Shivering may not be a sign of hypothermia but rather a side effect of certain anaesthetic agents. Meperidine (Demerol) may be given in small increments to decrease shivering. Deep breathing and coughing help to expel retained anaesthetic gases.

Malignant hyperthermia is a potentially lethal condition that can occur in patients who receive general anaesthesia (OPANA, 2009). It should be suspected when there is unexpected tachycardia and tachypnea; jaw muscle rigidity; body rigidity of limbs, abdomen, and chest; or hyperkalemia. Temperature elevation is a late sign. The PACU nurse will immediately administer dantrolene sodium ordered by the physician.

Infection is another possible cause of temperature elevation. The following interventions decrease the risk of postoperative infections: encouraging deep breathing and coughing, assisting with early ambulation, removing in-dwelling urinary catheters and IV catheters once the patient is voiding and drinking, and providing aseptic care of the surgical wound. Cultures are

obtained from patients suspected of having infections (see Chapter 46).

Maintaining Neurological Function. Orientation to the environment is important in maintaining the patient's mental status. You reorient the patient, explain that surgery has been completed, and describe procedures and nursing measures. The patient who was properly prepared before surgery is less likely to be anxious when nurses provide care. Any change in level of consciousness should be promptly reported to a physician.

Maintaining Fluid and Electrolyte Balances. An important nursing responsibility is maintaining patency and prescribed rate of IV infusions and monitoring fluid and electrolyte balances in the postoperative period. As the patient begins to take and tolerate oral fluids, the IV rate will be decreased. When an ambulatory surgical patient awakens and is able to tolerate fluids by mouth without gastrointestinal upset, the IV catheter is removed. When the patient no longer needs a continuous IV infusion, the IV line may be saline locked to preserve the site for antibiotics or other use (see Chapter 39). The patient also may receive blood products or artificial volume expanders, depending on blood loss during and after surgery.

Promoting Normal Bowel Elimination and Adequate Nutrition. Normally a patient who has had general anaesthesia does not receive fluids to drink in the PACU because of bowel sluggishness, the risk of nausea and vomiting, and grogginess from general anaesthesia. To minimize nausea, the patient should avoid sudden movement. For patients identified as being at high risk for the development of nausea and vomiting or patients who must not vomit (e.g., eye surgery), a combination of antiemetics may be recommended (Gan, 2002; Tramer, 2001). If the patient has a nasogastric tube, you check the position of the tube and ensure patency by observing for drainage. If suction is required, you verify that it is maintained at the required level (see Chapter 44). Occlusion of a nasogastric tube results in accumulation of gastric contents within the stomach.

The patient likely will begin taking ice chips or sips of fluids once he or she is returned to the acute care unit. If these are tolerated, a clear liquid meal usually will be ordered. Interventions for preventing gastrointestinal complications promote return of normal elimination and faster return of normal nutritional intake. It takes several days for a patient who has had surgery on gastrointestinal structures (e.g., a colon resection) to resume a normal diet. Normal peristalsis may not return for two to three days. In contrast, the patient whose gastrointestinal tract is unaffected directly by surgery can resume dietary intake after recovering from the effects of anaesthesia. The following measures promote return of normal elimination:

- Maintain a gradual progression in dietary intake. For the first few hours after surgery, a patient receives only IV fluids. If bowel sounds are active and the physician orders a normal diet for the first evening after surgery, begin by providing clear liquids, such as water, ginger ale, broth, or tea, after nausea subsides. Overloading the patient with large amounts of fluids may lead to distension and vomiting. If the patient tolerates liquids without nausea, advance the diet as ordered. Patients who have had abdominal surgery are usually NPO for the first 24 to 48 hours after the procedure. As peristalsis returns, provide clear liquids, followed by full liquids, a light diet of solid foods, and

finally the patient's usual diet. Encourage intake of foods high in protein and vitamin C.

- Promote ambulation and exercise. Physical activity stimulates a return of peristalsis. The patient who suffers abdominal distension and "gas pain" may obtain relief while walking.
- Maintain an adequate fluid intake. Fluids keep fecal material soft for easy passage. Fruit juices and warm liquids are especially effective.
- Administer fibre supplements, stool softeners, and rectal suppositories such as Dulcolax (bisacodyl) as ordered. If constipation or distension develops, the physician may attempt to stimulate peristalsis with cathartics or enemas, but caution must be exercised.
- Promote adequate food intake by stimulating the patient's appetite:
 - Remove sources of noxious odours and provide small servings of nonspicy foods.
 - Assist the patient to a comfortable position during mealtime. The patient should sit if possible to minimize pressure on the abdomen.
 - Provide desired servings of food. For example, a patient may be more willing to face his or her first meal when servings are not large.
 - Provide frequent oral hygiene. Adequate hydration and cleansing of the oral cavity eliminate dryness and bad tastes.
 - Provide meals when the patient is rested and free from pain. Often a patient loses interest in eating if mealtime has been preceded by exhausting activities, such as ambulation, coughing and deep breathing exercises, or extensive dressing changes. When a patient has pain, the associated nausea often causes a loss of appetite.

Promoting Urinary Elimination. The depressant effects of anaesthetics and analgesics impair the sensation of bladder fullness. If bladder tone is reduced, the patient has difficulty starting urination. However, patients should void within 8 to 12 hours after surgery. Because a full bladder can be painful and often causes restlessness in recovery, it may become necessary to insert a catheter. If the patient has an in-dwelling urinary catheter, the goal should be to have it removed as soon as possible because of the high risk for development of a nosocomial bladder or urinary tract infection.

Patients who undergo surgery of the urinary system frequently have an in-dwelling urinary catheter inserted to maintain free urinary flow until voluntary control of urination returns. The following measures promote normal urinary elimination (see Chapter 43):

- Help the patient to assume normal positions during voiding. The male patient may need assistance to stand to void. Bedpans make voiding difficult. A female patient will have better results if she is able to use a toilet or a bedside commode.
- Check the patient frequently for the need to void. A surgical patient restricted to bed needs assistance in handling and using bedpans or urinals. Often the patient acquires a sudden feeling of bladder fullness and urgency to void and will need help quickly.
- Assess for bladder distension. If a patient does not void within eight hours of surgery or if bladder distension is present, it may be necessary to insert a straight in and out urinary catheter. A physician's order is needed for this. Continued difficulty in voiding may require an in-dwelling

catheter, although the risk for a urinary tract infection increases.

- Monitor intake and output. Urine output should be at least 30 mL/hour for adults. If the urine is dark, concentrated, and low in volume, the physician should be notified. A patient can easily become dehydrated as a result of fluid loss from the surgical wound. Measure intake and output for several days after surgery until normal fluid intake and urinary output are achieved.

Promoting Wound Healing. A surgical wound undergoes considerable stress during convalescence. The stress of inadequate nutrition, impaired circulation, and metabolic alterations increases the risk for delayed healing (see Chapter 46). A wound also may undergo considerable physical stress. Strain on sutures from coughing, vomiting, distension, and movement of body parts can disrupt the wound layers. You protect the wound and promote healing. A critical time for wound healing is 24 to 72 hours after surgery, after which time a seal is established. If a wound becomes infected, it usually occurs three to six days after surgery. A clean surgical wound usually does not regain strength against normal stress for 15 to 20 days after surgery. You must use the aseptic technique during dressing changes and wound care (see Chapters 32 and 46). Surgical drains must remain patent so that accumulated secretions can escape from the wound bed. Ongoing observation of the wound identifies early signs and symptoms of infection.

Maintaining and Enhancing Self-Concept. The appearance of wounds, bulky dressings, and extruding drains and tubes threatens a patient's self-concept. The effects of surgery, such as disfiguring scars, may create permanent changes in the patient's body image. If surgery leads to impairment in body function, the patient's role within the family can change significantly.

You should observe patients for alterations in self-concept. Patients may show revulsion toward their appearance by refusing to look at incisions, carefully covering dressings with bedclothes, or refusing to get out of bed because of tubes and devices. The fear of not being able to return to a functional role in their families may cause patients to avoid participating in the care plan.

The family becomes an important part of efforts to improve the patient's self-concept. You explain the patient's appearance to the family and suggest ways to avoid nonverbal expressions of revulsion or surprise. The family needs to be accepting of the patient's concerns and encourage the patient's independence. If the condition is permanent, the family and patient will go through a grieving process. Coping strategies develop over time to manage the situation. The following measures help to maintain the patient's self-concept:

- Provide privacy during dressing changes or inspection of the wound. Keep room curtains closed around the bed, and drape the patient so that only the dressing or incisional area is exposed.
- Maintain the patient's hygiene. Wound drainage and antiseptic solutions from the surgical skin preparation dry on the patient's skin surface and cause irritation. When patients return to the unit, they should be given a postoperative bath and provided oral hygiene. In addition, a complete bath on the first day after surgery can make the patient feel renewed. When the patient's gown becomes soiled by wound drainage, offer a clean gown and washcloth. Keep the patient's

hair clean and neatly combed. Offer frequent oral hygiene. Room deodorizers may be useful if the odour from drainage seems particularly troublesome to the patient and the family.

- Prevent drainage devices from overflowing. Contents of drainage collections are measured every 8 hours or 12 hours for output recording and are emptied as they become full. The patient sometimes becomes preoccupied with observing the gradual collection of drainage, and some drainage devices can leak contents if they become too full.
- Maintain a pleasant environment. Self-concept is heightened by the patient being in pleasant, comfortable surroundings. Store or remove unused supplies and keep the patient's bedside orderly and clean.
- Offer opportunities for the patient to discuss feelings about his or her appearance. A patient who avoids looking at an incision may need to discuss fears or concerns. A patient having surgery for the first time is often more anxious than one who has had multiple surgeries. When the patient chooses to look at an incision for the first time, the area should be clean. Eventually, the patient should be able to care for the incision site by applying simple dressings or cleaning the affected area.
- Provide the family with opportunities to discuss ways to promote the patient's self-concept. Encouraging independence can be difficult for a family member who has a strong desire to assist the patient in any way. By knowing about the appearance of a wound or incision, family members can be supportive during dressing changes. The topic or tone of a conversation can also help family members support a patient who is dwelling on fears and concerns. Family members should not avoid discussing the future. However, they need help to know when it is appropriate to discuss future plans. Then the patient and family can work together to discuss realistic plans for the patient's return home.

Restorative and Continuing Care

You, the patient, and the family work to prepare the patient for discharge. Education regarding wound care, activity level, diet, medications, and specifics related to the type of surgery is an ongoing process throughout hospitalization. After discharge, some patients will need assistance from home care services with tasks such as wound care (Box 48-8). With ambulatory surgery patients, focused education within the limited time is essential. Including the family or a significant other person provides a resource for the patient once he or she is at home (see Box 48-6). With both ambulatory and hospitalized surgical patients, nurses provide a wide variety of written educational materials. For example, educational materials with many pictures should be used with patients who do not speak your language or who have limited reading ability. Materials should be sensitive to various cultures and religions. However, the provision of materials does not ensure understanding. Verification, return demonstration, and ongoing clarification are required.

Evaluation

Patient Care

You evaluate the effectiveness of care provided to the surgical patient on the basis of expected outcomes after nursing interventions. In all surgical settings, you consult with the patient

* BOX 48-8

FOCUS ON PRIMARY HEALTH CARE

Recovery at Home

Regardless of the length of time the patient spends in hospital, it is essential that you ensure that the patient and family have the appropriate information and skills needed to continue a successful recovery at home. However, time is often very limited, especially with the move toward preadmission units and short hospital stays. A comprehensive approach is needed to ensure continuity of care from hospital to home. A patient is often expected to continue dressing care, follow activity restrictions, continue medication therapy, and observe for signs and symptoms of complications upon returning home. In addition, the patient needs someone to be present for the first 24 hours to ensure that no delayed reaction from the anaesthesia occurs, such as difficulty breathing. A referral to home care assists patients who are unable to perform self-care activities. Close association with home care services is required for some patients if dressing changes or physiotherapy is needed. It is useful to have a case management nurse in attendance at discharge to convey what tasks a patient can perform effectively.



and the family to gather evaluation data. You can evaluate the ambulatory surgical patient's outcomes via a telephone call to the patient's home, asking specific questions to determine whether complications have developed and whether the patient understands restrictions or medications. This call is usually placed 24 hours after surgery, which allows you to evaluate the progress of recovery.

In an acute care setting, evaluation of a surgical patient is ongoing. If a patient fails to progress as expected, you revise the patient's care plan according to the priorities of the patient's needs. Every effort is made to assist the patient in returning to as healthy and functional a state as possible. Your evaluation also includes determining the extent to which the patient and the family have learned self-care measures.

Patient Expectations

With short hospital stays and ambulatory surgery, it is especially important to evaluate patient expectations early in the postoperative process. Pain relief is usually a priority. Asking the patient if everything possible has been done to alleviate pain, including nonpharmacological measures, can determine whether the patient's needs have been met. Timeliness of response to the patient's needs, such as scheduled times for pain medication and prompt answering of a call light, may increase satisfaction. The patient usually wants to be discharged from acute care as soon as possible and when indicated by the physician. Ensuring that discharge plans are in place facilitates that process and enhances the patient's satisfaction with care.

* KEY CONCEPTS

- Perioperative nursing is nursing care provided to the surgical patient before, during, and after surgery.
- Surgery is classified by level of severity, urgency, and purpose.
- The preoperative period may be several days or only a few hours long.

- Preoperative assessment of vital signs and physical findings provides an important baseline with which to compare postoperative assessment data.
- Nursing diagnoses of the surgical patient may pose implications for nursing care during one or all phases of surgery.
- Primary responsibility for obtaining informed consent rests with the patient's surgeon.
- Structured preoperative teaching has a positive influence on a patient's postoperative recovery.
- Basic to preoperative teaching is an explanation of all preoperative and postoperative routines and demonstration of postoperative exercises.
- In ambulatory surgery, nurses must use the limited time available to educate patients, assess their health status, and prepare them for surgery.
- A routine preoperative (preprocedure) checklist can be used as a guide for final preparation of the patient before surgery.
- Many responsibilities of nurses within the OR focus on protecting the patient from potential harm.
- All medications taken before surgery are automatically discontinued after surgery unless a physician reorders the drugs.
- Family members or other supportive networks are important in assisting patients with any physical limitations and in providing emotional support during postoperative recovery and ongoing care at home.
- Assessment of the postoperative patient centres on the body systems most likely to be affected by anaesthesia, immobilization, and surgical trauma.
- Accurate pain assessment and intervention are necessary for healing.
- Nurses in the postoperative surgical unit provide the discharge education required so that the patient and the family can manage at home.

* CRITICAL THINKING EXERCISES

1. An 82-year-old patient is admitted for surgery on a fractured hip caused by a fall. What postoperative complications are typical in the older patient undergoing this type of surgery?
2. Mr. B. is a 52-year-old patient who will undergo thoracic surgery. He has smoked one pack of cigarettes per day for 30 years. What type of pulmonary preventive measures would you expect Mr. B. to need postoperatively?
3. Mrs. C. was admitted for same-day surgery for an inguinal hernia repair. What discharge criteria would be used for Mrs. C., and what discharge instructions would she require?
4. Your patient is scheduled for abdominal hysterectomy at 2:00 P.M. Based on NPO guidelines, what fasting schedule should you implement in collaboration with the surgeon and the anaesthesiologist?
5. You are doing preoperative teaching for a patient undergoing a minimally invasive surgical technique. Identify one advantage of this type of surgery.

* REVIEW QUESTIONS

1. An obese patient is at risk for poor wound healing and for wound infection postoperatively because
 1. Ventilatory capacity is reduced
 2. Fatty tissue has a poor blood supply
 3. Risk for dehiscence is increased
 4. Resuming normal physical activity is delayed

2. You should ask each patient preoperatively for the name and dose of all prescription and over-the-counter medications taken before surgery because they
 1. May cause allergies to develop
 2. Are automatically ordered postoperatively
 3. May create greater risks for complications or interact with anaesthetic agents
 4. Should be taken on the morning of surgery with sips of water
3. A patient who smokes two packs of cigarettes per day is most at risk postoperatively for
 1. Infection
 2. Pneumonia
 3. Hypotension
 4. Cardiac dysrhythmias
4. Family members should be included when you teach the patient preoperative exercises so that they can
 1. Supervise the patient at home
 2. Coach the patient postoperatively
 3. Practise with the patient while waiting to be taken to the operating room
 4. Relieve you by getting the patient to do his or her exercises every two hours
5. In the postoperative period, measuring input and output helps assess
 1. Renal and circulatory function
 2. Patient comfort
 3. Neurological function
 4. Gastrointestinal function
6. In the PACU, one measure taken to maintain airway patency is to
 1. Suction the pharynx and bronchial tree
 2. Give oxygen through a mask at 10 L/minute
 3. Position the patient so that the tongue falls forward
 4. Sit patient in high-Fowler's position
7. Which one of the following measures promotes normal venous return and circulatory blood flow?
 1. Suctioning artificial airways and the oral cavity
 2. Monitoring fluid and electrolyte status during every shift
 3. Having the patient deep breath and cough
 4. Encouraging the patient to perform leg exercises at least once an hour while awake
8. A patient with an international normalized ratio (INR) or an activated partial thromboplastin time (APTT) greater than normal is at risk postoperatively for
 1. Anemia
 2. Bleeding
 3. Infection
 4. Cardiac dysrhythmias
9. When the patient is engaging in deep breathing and coughing exercises, it is important to have the patient sitting because this position
 1. Is more comfortable
 2. Facilitates expansion of the thorax
 3. Increases the patient's view of the room and is more relaxing
 4. Helps the patient to splint with a pillow
10. In the postoperative period, if a patient has unexpected tachycardia and tachypnea; jaw muscle rigidity; body rigidity of limbs, abdomen, and chest; or hyperkalemia, you should suspect
 1. Infection
 2. Hypertension
 3. Pneumonia
 4. Malignant hyperthermia

✦ RECOMMENDED WEB SITES

Canadian Anesthesiologists' Society: <http://www.cas.ca>

This Web site offers patient information about and guidelines for using anaesthesia.

National Association of PeriAnesthesia Nurses of Canada: <http://www.napanc.org>

Perianaesthesia nurses are registered nurses with advanced knowledge in the care of patients during all phases of perianaesthesia, including, for example, nurses in postanesthesia care units, same-day surgery, and diagnostic imaging.

Operating Room Nurses Association of Canada: <http://www.ornac.ca>

This Web site provides practice standards for Canadian operating room nurses, as well as information on certification with the Canadian Nurses Association (CNA).

Ontario PeriAnesthesia Nurses Association: <http://www.opana.org>

This Web site provides position statements on and standards of perianaesthesia nursing practice.

Review Question Answers

1. 2, 2, 3, 3, 2, 4, 2, 5, 1, 6, 3, 7, 4, 8, 2, 9, 2, 10, 4

Rationales for the Review Questions appear at the end of the book.

Appendix A Practical Nursing in Canada

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objectives

Mastery of content in this appendix will enable you to:

- Define the key terms listed.
- Explain how practical nursing has evolved as a regulated nursing group in Canada.
- Discuss the current issues and trends that affect practical nurses in Canada.
- Differentiate the scope of practice of the practical nurse from that of the RN and unregulated health care provider.
- Explain how legislation, regulatory bodies, and professional associations govern the practice of practical nurses.
- Predict the future role of practical nurses within the Canadian health care system.

key terms

acuity, p. 1372	practical nurses, p. 1372
attrition, p. 1377	proactive, p. 1384
competence, p. 1380	protected title, p. 1372
controlled act (reserved act), p. 1382	registration, p. 1372
credentialling, p. 1375	RN, p. 1372
creeping credentialism, p. 1372	RPN, p. 1374
delegation, p. 1380	specialization, p. 1374
educational laddering, p. 1376	speciation, p. 1374
epidemiology, p. 1385	standards of practice, p. 1378
LPN, p. 1372	supervision, p. 1380
	unregulated care providers, p. 1373

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History of Practical Nursing in Canada

Practical nursing is the second-largest regulated nursing group in Canada. It has a relatively short history, having become a profession only in the late 1930s. Initially beginning as a hands-on, hospital-based program with few common standards and little legislative control, practical nursing has evolved into a profession that requires a sound knowledge base and is publicly accountable under legislative control.

The Beginnings of Practical Nursing

In some respects, practical nursing has always existed. Whenever people have provided “hands-on” nursing care, they have been providing practical nursing care. Only since the 1970s, however, has practical nursing been

recognized as a distinct profession that necessitates formal education. Until about the mid-1970s, only minimal high school preparation was necessary for entry into a practical nursing program, and the program was most often a short apprenticeship in a hospital setting. No licensure examination was required. Also, no official **registration**, **protected title**, or professional body existed.

The Evolution of Practical Nursing

Practical nursing has evolved in a similar way in most provinces. It has also followed a similar pattern that other occupations have followed when they are established as professions. Abbott (1988) studied 130 occupations and noted that as they evolve into professions, the following characteristics are developed:

1. A national professional association
2. Government-sponsored licensing legislation
3. Professional examinations
4. A professional school separate from schools for other professions
5. A university-based professional education
6. A code of ethics
7. A national-level journal
8. An accreditation program (in the United States) or a certification program (in the United Kingdom)

Except for university-based education requirements and a national-level journal, practical nursing has established all the other steps. Abbott (1988), however, did not note the series of name and designation changes that seem to be unique to practical nursing, nor did his list highlight the tendency to require increasing levels of education, which some authorities have termed "**creeping credentialism**."

Canada. As early as 1914, the Canadian National Association for Trained Nurses (called the Canadian Nurses Association [CNA] since 1924) recognized the value of practical nursing, especially for providing care to patients in the home (College of Licensed Practical Nurses of British Columbia [CLPNBC], 2011). The first **practical nurses** were usually called either nursing aides (if female) or orderlies (if male).

In 1931, practical nurses in Canada numbered 4700. By 1947, this statistic had increased to more than 7900, largely because of increased hospital service needs after the Second World War. The first formal education program specifically for practical nurses (as opposed to nursing aides or orderlies) began in Manitoba in 1945 (Canadian Institute for Health Information [CIHI], 2010; College of Licensed Practical Nurses of British Columbia [CLPNBC], 2011, p. 81). The first legislative acts controlling the education, testing, licensing, regulation, and practice of practical nursing were introduced in the 1940s.

Over the years, practical nursing in Canada has undergone many changes in designation, as well as function. Practical nurses have struggled to achieve self-regulation, rather than government regulation, of their profession.

Many of the changes in the education of the practical nurse reflect the same changes that occurred earlier in the education of the registered nurse (RN). Practical nurses are required to obtain higher levels of education. Education programs have become longer and more complex and have moved from hospital schools to postsecondary institutions, such as colleges. Rather than continuing to emphasize tasks and procedures, education programs have begun to focus more on holistic principles of nursing.

In the 1980s, most provinces developed regulations to govern practical nursing and were requiring graduates to write a licensing examination provided by what was then the Canadian Nurses Association Testing Service (CNATS). Graduates of practical nursing programs across Canada (except in Quebec) now must pass a national registration examination before they can begin professional practice. (Quebec has its own practical nursing examination.)

Table A-1 presents historical highlights in the evolution of practical nursing in selected provinces.

United States. In the United States, the first official practical nurse program was started by the Ballard School in New York in 1893, with a three-month course to train women in simple nursing care, home care, and cooking (Hill & Howlett, 2005).

US nurses were the first to use the term *licensed practical nurse (LPN)*, setting a precedent that many Canadian provinces and territories have since followed.

United Kingdom. Before the early 1990s, nursing education in the United Kingdom was provided in nursing schools attached to hospitals. Project 2000, started in the early 1990s in the United Kingdom, aimed to increase the professional stature of nursing by removing it from its hospital service base and placing it in postsecondary educational institutions. Today, nursing education in the United Kingdom, as in Canada and the United States, takes place in the postsecondary school system at the college or technical school level (NursingNetUK, n.d.). Courses in enrolled nursing (the closest equivalent to practical nursing) no longer officially exist. Therefore, practical nurses from other countries cannot be certified in nursing in the United Kingdom unless they undergo upgrading.

The Demand for Practical Nursing

In the late 1940s and early 1950s, demand for practical nurses increased significantly in most jurisdictions. A number of factors were responsible for this increased demand, including political and economic pressures, changes within the nursing profession, and ecological and sociological factors.

Political and Economic Pressures. As roles for women expanded after the Second World War and more opportunities were available in a range of occupations and professions, the number of nurses decreased. This shortage of registered nurses came at a time when patients' **acuity** (i.e., their level of sickness) was increasing in institutions. In addition, an increasing aged population was requiring more supportive care in communities and long-term care facilities, and private enterprise began exerting a greater economic influence on health care.

Because this public demand for safe and competent practice increased at the same time as economic and personnel challenges, practical nursing became more important within the health care system. Practical nursing offered an economical but highly competent workforce to meet the needs of patients in hospitals and those requiring long-term care.

Changes Within Nursing

Nursing Education. The changing methods of educating nurses also contributed to the personnel and economic challenges in the health care sector. For many years, hospitals and other health care agencies depended on nursing students for the free staffing of their institutions. When nursing education moved from a hospital base to a postsecondary base (beginning in the early 1970s), the number of available staff decreased suddenly. Institutions responded by employing

TABLE A-1
History of Practical Nursing in Selected Provinces

Province	Year	Significant Developments and Comments
British Columbia (BC)	1951	<i>Practical Nurse Act</i> passed
	1965	<i>Practical Nurses' Act</i> legally approved
		Council of LPNs established as the licensing body
	1991	Council of LPNs becomes an independent regulatory body of the Ministry of Health
Alberta	1996	The Council of LPNs in BC becomes the College of LPNs of B.C. under <i>Health Professions Act</i>
	1945	The School for Nursing Aides established in Calgary, sponsored by Department of Veterans Affairs and Canadian Vocational Training
	1947	<i>The Provincial Nursing Aides Act</i> passed, allowing licensing of the Certified Nursing Aide
	1961	Alberta Certified Nursing Aide Association (ACNAA) incorporated
	1972	Alberta Certified Nursing Aide Association, along with eight other practical nursing associations, becomes a founding member of the Canadian Association of Practical Nurses and Nursing Assistants
	1978	<i>Nursing Assistant Registration Act</i> combines aide and orderly in one category of RNA (registered nursing assistant)
	1987	Professional Council of RNAs (PCRNA) becomes first health care discipline under <i>Health Disciplines Act</i> . Registered nursing assistants become self-regulatory with a distinct scope of practice.
		Nursing assistant graduates required to write <i>Canadian Practical Nurse Registration Examination</i> (national licensing examination)
	1990	RNAs change title to LPNs
		Professional Council of RNAs becomes Professional Council of LPNs
	1995	Mandatory educational upgrading instituted as a result of LPN devaluation and membership decline
	1998	Council changes its name to College of Licensed Practical Nurses of Alberta
	1999	<i>Health Disciplines Act</i> becomes <i>Health Professions Act</i> , which will eventually include all regulated health care professions under their separate provincial colleges
	2003	The College of Licensed Practical Nurses of Alberta is formally proclaimed
	2004	LPNs in specialized practice are recognized by the <i>Health Professions Act</i>
	2006	Diploma is approved as the entry-to-practice requirement
	2009	Number of Alberta LPNs doubles between 1999 and 2009
Manitoba	1945	First official practical nurse education program in Canada
Ontario	1938	Centres begin offering six-month courses for nursing assistants
	1941–1945	With approval of Ontario Department of Health, Registered Nurses Association of Ontario (RNAO) sponsors eight six-month training programs for nursing assistants
	1947	<i>Nurses Act</i> is amended to allow title of Certified Nursing Assistant (CNA)
	1963	CNA title is changed to Registered Nursing Assistant (RNA)
	1990	RNA training programs moved to community colleges
	1993	RNA title is changed to Registered Practical Nurse (RPN)
	2001	College of Nurses of Ontario passes a regulation to require all RPNs to obtain their basic diploma through an enhanced two-year program in a provincial college as an entry-to-practice requirement beginning January 2005
	2002	All practical nursing programs were offered in colleges
	1977	Legislature established an act of incorporation, giving the Association of New Brunswick Registered Nursing Assistants the responsibility of education, registration, and discipline of registered practical nurses
	1987 and 2000	Unsuccessful attempts to change the RNA title to Licensed Practical Nurse through the New Brunswick Legislature
New Brunswick	2002	The Licensed Practical Nurses Act recognizes the new LPN title
		The Association of New Brunswick Licensed Practical Nurses becomes the name of the provincial association

Data from College of Licensed Practical Nurses of British Columbia (2009, 2011), College of Licensed Practical Nurses of Alberta (2011), Canadian Institute for Health Information (CIHI, 2010, p. 81), Registered Practical Nurses Association of Ontario (2011a, pp. 1, 2), and Association of New Brunswick Licensed Practical Nurses (2011).

greater numbers of poorly trained health care assistants (i.e., **unregulated care providers**) to provide basic care. This reliance on a less trained workforce has not always benefited the public, who demand accountability and professionalism in health care. Increased public demand has resulted in higher standards and legal licensing requirements for all categories of nurse, including the practical nurse.

Registration Laws. The introduction of registration requirements for RNs also influenced the practical nurse.

Nurse registration laws in the earlier part of the twentieth century protected the title of “registered nurse”; however, they could not control other forms of nonregistered nursing. As long as unregulated care providers did not claim to be registered, they could still practise many nursing activities. This enabled agencies to save money by hiring these less expensive but less qualified workers.

After the Second World War, the public began demanding more qualified practitioners. As a result, nurse registration

laws were amended to allow the creation of another level within nursing practice. Most provinces now have two categories of nurses: (1) registered nurses (including nurse practitioners), and (2) practical nurses. A nurse in the practical nurse category can use the title "registered practical nurse" (RPN) or "licensed practical nurse" (LPN), depending on the provincial or territorial regulatory body. In the four western provinces, a third category exists: registered psychiatric nurses (also referred to as RPNs).

Development of Categories within the Nursing Profession. As noted previously, Canadian nursing has evolved into two categories of professional practitioners (and in the four western provinces, three): registered nurses and practical nurses. In comparison with the nursing profession, the medical profession essentially has one level of practitioner (a medical doctor) and many subspecialties (e.g., pediatrics, ophthalmology, orthopedics, and so on). Medical doctors also cede limited activities to other professions while maintaining their own professional position. For example, ophthalmologists (medical doctors specializing in vision disorders) are authorized to measure vision and prescribe corrective lenses. However, their practice involves many more responsibilities than these two simple functions. Therefore, they cede these two functions to optometrists. Optometrists have a unique, limited scope of practice and make no claims to be medical doctors. In the United States and Canada, some doctors also have physician's assistants to perform limited tasks. Like optometrists, these workers do not claim to be medical doctors.

Between the medical profession and its various offshoots, it can thus be seen that the boundaries of practice are quite distinct. Medicine has retained the central tasks of diagnosis and treatment of human disease states, functions that are clear in the public mind. Nursing, however, has developed a much less definitive practice, dividing the professional knowledge base and functions somewhat less clearly and neatly. Basic theory and practice are common to both categories of nurses, which are divided only by depth of knowledge and complexity of care required. However, patient complexity, predictability, and stability are hardly absolute. They are easily changeable and can be difficult to define. As a result, practitioners and the public are sometimes unsure about the boundaries between registered and practical nurses.

Exploring the theories of ecology and sociology as they apply to nursing can offer further insights into the development of two categories of nursing. These theories consider reactions to change and competition among groups for functions, power, rewards, and even professional survival.

Ecological and Sociological Factors

Ecology Theory Applied to Nursing. Ecology theory in general describes changes in populations resulting from environment and evolution. Ecology theory originally referred only to plants and animals, but some authorities have expanded it to apply to social groups such as companies and professions (Wilson, 1992).

In order to survive, groups must (1) compete for niches (places or functions in any system) and (2) evolve to cope effectively with environmental changes. Groups that have too narrow a function or who fail to compete successfully lose their niche to other groups. Niches may also change; therefore, successful adaptation requires either competing for a new niche or acquiring the niche first and establishing a solid place in it.

Two concepts in biological evolution that can be applied to practical nursing are the concepts of **speciation** and

hybridization. In *speciation*, the species divides into one or more subspecies, each with its own particular function or niche. In *hybridization*, the new species adopts characteristics of one or more of the ancestor species (Van House & Sutton, 2000).

If the concept of speciation is applied to nursing, it is apparent that the functions of the "species" of nurses have evolved. Out of the single species, two "subspecies" have arisen: the registered nurse (who usually has a university degree and is educated to cope with a wide variety of patient [environmental] challenges) and the practical nurse (who has a college diploma and is educated to cope with a limited variety of patient challenges). Some provinces also have a third "subspecies," the registered psychiatric nurse, who has a college education and is trained to provide care to patients with mental illness. The niche for the registered nurse is wider than that of the practical nurse, and the niche for the registered psychiatric nurse is the narrowest of all.

The concept of hybridization can also be applied to nursing. Nursing has adopted characteristics of other "species"; in particular, it has adopted ideas and technology that have previously been exclusively medical functions. For example, taking blood pressure, starting intravenous infusions, and making certain types of diagnoses are now nursing functions that used to be medical functions.

It is interesting that whereas nursing has developed speciation, medicine has avoided speciation and instead developed **specialization**. Where nurses share functions, doctors cede specific unwanted functions to different professionals. The sharing of functions among practical and registered nurses is what contributes to the public and professional confusion about the roles of the two levels of nurses.

Sociology Applied to Nursing. Sociology is the study of group roles, functions, and interactions. Abbott's (1988) unique theory about professions can be melded with ecology theory to provide more insight into the development of professions. According to Abbott, a profession attempts to keep certain tasks or problems for itself and shares them with others only if it can do so without endangering its own niche.

Abbott (1988) also believed that a profession protects itself and its niche position by possessing a sound knowledge base. In other words, acquiring knowledge is central to developing a strong professional identity. Abbott believed that knowledge sets a true profession apart from a mere occupation:

Practical skill grows out of an abstract system of knowledge and control of the occupation lies in control of the abstractions that generate the practical techniques ... Any occupation can obtain licensure (e.g., beauticians) or develop an ethics code (e.g., real estate). But only a knowledge system governed by abstractions can redefine its problems and tasks, defend them from interlopers, and seize new problems ... Abstraction enables survival in the competitive system of professions. (p.8)

Professional tasks are either objective (knowledge and technology based) or subjective (culturally or legally based) in nature. Some objective tasks unique to nursing have been the development of the nursing process and nursing diagnoses. Subjective tasks are most clearly seen in the legal criteria for nursing defined in each province. For example, the *Ontario Regulated Health Professions Act* defines three authorized (controlled) acts that may be performed by nurses in that province: performing a procedure below the dermis or mucous

membrane; placing an instrument, hand, or finger into a body opening; and administering a substance by injection or inhalation. Of course, much overlap exists; that is, the authorized nursing acts in Ontario are based on both knowledge and technology and are legally defined (College of Nurses of Ontario [CNO], 2009a).

Objective tasks are more resistant to change than are subjective tasks. Environment often brings in new tasks, new knowledge, and new technology. The successful profession adopts the knowledge and new tasks it wants, strives to maintain current knowledge and tasks it considers worth keeping, and works to prevent other professions from intervening in its acquired knowledge and task base (its ecological niche). A successful profession is supported in this by subjective forces from the environment, such as legal sanctions, public opinion, and workplace practices and rules, all of which reflect the culture and the society.

Practical nursing has had mixed success in these areas. Most jurisdictions have enacted definitive legal supports (such as registration, licensing, and protected title) for a particular knowledge base and specified range of tasks. However, practical nurses still strive to clarify their role for both the public and the government. Their knowledge and practice are very similar to those of registered nurses (varying only in depth and skill level, as noted previously). The workplace in many provinces is also challenged to make appropriate use of the practical nurse's skills in many areas, avoiding either underuse or exploitation of the practical nurse's knowledge and skill set:

Abbott's [1988] analysis also casts light on the debate raging in most professional schools—what is the perfect balance between theory and practice? A student focusing solely on theory (or the abstract knowledge base) lacks the skills and tools to practice the profession; however, Abbott [warned] that practice-based knowledge lacks abstraction. An exclusive focus on the tools and service models leaves the student with no ability to extend the underlying knowledge base to new niches. In times of rapid change in niches, a thorough understanding of the knowledge base, not simply the tools and skills, is most likely to provide safe passage to the new environment. (Van House & Sutton, 2000, p. 60)

Practical nurses in Canada are striving to achieve a balance in both theory and practice. Basic education is increasing in complexity and promoting the concept of lifelong learning for the professional. In addition to basic education, many practical nurses complete **credentialling** in specialty areas after graduation, which enhances the individual's knowledge base and adaptive ability and increases professional credibility in the public mind.

Failure to adapt to changes can result in a loss of niche, role, and position. A profession could become like the panda, endangered because it has an extremely narrow niche in the ecosystem and is unable to adapt to the changing environment (Van House & Sutton, 2000). On the other hand, having a niche that is too broad could result in the profession's loss of political (public, governmental, and interprofessional) support. Too much knowledge or task sharing between specific niches (blurred boundaries) could also threaten survival of a professional species.

We have addressed some reasons for the development of practical nursing as a unique profession and provided some theoretical insights. However, why distinct levels (or species) have developed within nursing is still unanswered. It remains to be seen whether this division of professional nursing into

two (and three) levels of practitioner will strengthen or weaken nursing as a profession and preserve its position in the health care system.

Practical Nursing Today: Issues and Trends

Like other evolving professions, practical nurses face many issues and trends pertaining to their educational requirements and clinical roles. Many of the same issues and trends are apparent across the country.

Educational Preparation

Patients' needs are becoming ever more complex. Practical nurses must respond to increased acuity, wide cultural and social variations among patients, and a continuing trend toward home and community care. As the practice environment for practical nurses changes, national entry-to-practice competencies are reviewed and revised (as of this writing, the most recent changes occurred in 2011 [Assessment Strategies Inc., 2011]). Practical nursing education has become more demanding as programs strive to prepare practical nurses to meet these changing requirements at the entry level. Most programs include strong theory and practical hands-on components, as well as clinical consolidation and preceptorship experiences before graduation.

Entry to a Practical Nurse Program. Entry requirements for practical nursing programs have become more stringent. At one time, only a Grade 9 or 10 level of education was required for entry into a practical nursing school. Now, Canadian practical nursing programs require that applicants have a high school diploma. Most require that they also have high marks in language and in one or two sciences. Many postsecondary institutions also admit mature students without a high school diploma if they can demonstrate equivalent learning through other forms of education or can successfully complete mature student testing.

Location and Length of Program. In most Canadian jurisdictions, practical nursing programs are diploma programs that run for two academic years (approximately four semesters) and are offered in postsecondary institutions. In order to facilitate student access to nursing education, some educational institutions are offering practical nursing programs by nontraditional delivery methods such as distance education and online learning. The CIHI (2010) reported that in 2009, 97.5% of practical nurses in all provinces and territories possessed an initial diploma or certificate level of education or equivalent (p. 81). The programs commonly require two years in order to address the complexity of the patient base and the need for knowledgeable and flexible professional care.

Instructors in Practical Nursing Programs. Canadian nursing instructors are usually required to have clinical experience and educational preparation that is at least one level beyond that of their students. At one time, this meant that registered nurses taught aides and practical nurses. Today, almost without exception, registered nurses with baccalaureate degrees teach in practical nursing programs. Many have master's degrees or doctorates in nursing, education, or other related areas.

Registered nurses and practical nurses are most often involved with teaching students in the clinical area. These clinical teachers may be hired directly by a postsecondary

institution or may be employees of the agency in which clinical practice takes place. Teaching models vary; some programs employ practical nurses as course instructors, and others employ them as assistants under the direction of a lead course instructor. Practising LPNs also serve as role models and support students educationally during preceptorship experiences.

Student Clinical Practice. The practical nurse can work in many clinical settings. Securing appropriate clinical placements for students is a challenge in some provinces, for two main reasons:

1. Some acute care areas (e.g., surgery, acute medicine, and pediatric wards) either do not use or limit the use of practical nurses in patient care. Even though documented professional standards indicate that practical nurses are qualified to work in such areas, many institutional bureaucracies and individual staff either are unfamiliar with new standards or feel personally and legally uncomfortable with them.
2. Many areas are inundated with requests for clinical placements of students from various health care fields, often at the same time. This problem is especially prominent in the larger urban centres, where many university and college health care students compete for clinical placements. Not having appropriate clinical placements is a serious issue for students. Practical nursing students need to be placed in clinical settings in which they can work to their full scope of practice. If they do not have this opportunity, their educational experience suffers. To address these challenges, practical nursing programs are incorporating innovative approaches to better prepare their students for clinical placements and to maximize the quality of their clinical experiences. Many schools are integrating the use of "computerized human patient simulators" and clinical simulations in order to increase student confidence and enhance readiness to practise before clinical practicum experiences. Clinical scheduling has extended beyond "banker's hours" to weekends and a variety of other shifts. Program delivery models have also been adjusted to allow for clinical placements during summer months, when units are more readily available.

Entry-to-Practice Requirements

The professional regulatory college is mandated by the government to set minimum entry-to-practice requirements in order to promote public safety and professional accountability. Usually, professional groups tell the regulatory college what these requirements should be. In most Canadian jurisdictions, entry-to-practice requirements for practical nursing include the following:

- Graduation from an approved postsecondary program for practical nursing, with the appropriate number of hours of theory and practice and with the appropriate courses taken
- A clear result of a criminal record check
- A sound knowledge base in all aspects of the nursing process (assessment, planning, implementing, and evaluating nursing care) for patients throughout the lifespan
- Ability to function independently and to function collaboratively with other health care providers, especially registered nurses, when caring for patients in more acute, unpredictable, or unstable conditions
- Ability to work in a variety of settings with individuals, families, groups, and in some cases communities
- Ability to apply ethical practice standards

- Ability to collaborate and communicate with others, including the patient and other health care personnel (including health teaching)
- Ability to be accountable for own actions and to work within the scope of practice
- Ability to be a lifelong learner
- Ability to cope effectively with change

It is important to note that these entry-to-practice requirements reflect minimal standards for safe, ethical, and competent practice (although that minimum appears to be increasing). These standards may also vary among jurisdictions.

Trend to More Education. For some time, the entry-to-practice requirements have increased (this phenomenon is also called *creeping credentialism*). A number of factors are thought to be responsible for this trend, including new and rapid developments in technology, increased public expectations, professional competitiveness and turf protection, increased postsecondary education trends, and expanded markets.

These increases in entry-to-practice requirements have both positive and negative aspects for the individual professional, the professions, the workplace, the government, and society in general. The positive effects may include increases in employment opportunities, national and international mobility, and the quality of service to the public and enhancement of research potential and development. The negative effects may include increases in educational costs for the individual and society, delay of the professional's entry into the job market, problems in workplace collective agreements, exacerbation of job shortages, and creation of economic burdens for employers because people with higher credentials tend to expect higher wages.

Continuing Education Issues

Laddering. Should health care aides be given the opportunity to become practical nurses? Should practical nurses be given the opportunity to become degree nurses? The concept of **educational laddering**, or *bridging*, recognizes prior learning and acknowledges that knowledge and expertise are acquired in various ways. It provides a means by which individuals can progress in their careers without being forbidden reasonable access to other levels or categories. Institutions across Canada are beginning to offer academic pathways that bridge health care aide and practical nursing programs, as well as practical nursing and registered nursing programs. The key phrase is "reasonable access." Because registered nurses and practical nurses aspire to different levels of practice, the applicant's previous experience must be carefully considered in order to protect the discipline of nursing.

Postgraduate Certification. Practical nurses can further their education and their contribution to the profession by specializing in specific fields.

Practical nurses have plentiful opportunities to obtain certification in specialty areas after graduation from a basic program. These certificates may be offered to practical nurses or to both registered and practical nurses. Examples of specialty areas are certification in operating room technique and management, foot care, gerontology and geriatric nursing, dialysis, women's health, specialized mental health, and occupational nursing.

The Role of the Practical Nurse

Most jurisdictions recognize that practical nursing is a separate category within the wider field of professional nursing. Most

jurisdictions also recognize that practical nurses and registered nurses learn about the same body of nursing knowledge. RNs study this content in more detail and over a longer period of time, while practical nurses study it for a shorter period, resulting in more focused knowledge.

Many practical nurses are employed in chronic care settings and in the fields of gerontology and geriatrics. Increasingly, however, health care agencies and institutions are hiring practical nurses in acute care and nontraditional settings where they may work independently or collaboratively with RNs. Consequently, practical nurse programs are teaching students to provide care for stable and acute care patients and are providing training for skills needed in acute care settings (e.g. intravenous therapy, oxygen therapy).

Table A-2 lists the percentages of practical nurses in Canada employed in different areas of responsibility in 2009.

Many practical nurses are eager to assume new roles and responsibilities in acute care settings, and they are legally entitled to do so. However, they may have difficulty obtaining employment and may be underutilized in these settings because many barriers arise from institutional culture, personal prejudices, and past practices.

As registered nurses continue to exert a large amount of control within the nursing profession, practical nurses may be restricted entry into certain aspects of the nursing niche. Most nursing managers are registered nurses with baccalaureate degrees or postgraduate degrees. They sometimes resist

allowing practical nurses into certain clinical areas for a combination of reasons: lack of understanding regarding the latest changes in practical nursing and scope of practice, belief that patients' acuity is too extreme for practical nurses, and fear of litigation, bureaucratic pressures, or union pressures to maintain registered nurses' positions. Practical nurses themselves may encounter difficulties because of personal fears associated with role change. As staffing proportions change, it is imperative that institutions establish clear mechanisms and policies that support effective utilization of both registered nurses and practical nurses in providing patient care.

Workplace Issues

The nursing profession currently has a high rate of **attrition** and frequent occurrences of stress and burnout in the workplace. Many factors create this climate of unease in the workplace:

- The pay is relatively poor for the work provided.
- Nurses face heavy workloads, and staffing patterns are complicated.
- Rates of overtime and sick time are high among nurses.
- Nurses face situations of ethical distress (Canadian Nurses Association, 2003).
- It is common for practical nurses to be working for several employers.
- Patients are entering hospitals with a higher level of acuity.
- Care requirements are becoming more complex.
- Health care delivery is continually shifting to meet patient needs (e.g., the shift to community and long-term care).
- Institutional support for nursing activities is either actually lacking or perceived to be lacking. Many practical nurses feel discouraged when the nursing system fails to recognize or fully use their abilities.
- Bed closures, downsizing, and use of unregulated care providers are increasing.

Workforce Issues

The number of practical nurses is increasing slowly, but an actual shortage is forthcoming as nurses reach retirement age, are downsized, are replaced by other personnel, or leave the nursing profession. Government and nursing bodies alike have identified the critical need for action to address the predicted nursing shortage through recruitment and retention strategies.

The nursing workforce is aging, and high retirement rates are pending. In 2009, the average age of Canadian LPNs was 43.4 years, with the proportion of LPNs in the 50 to 54 age group being the highest in most jurisdictions (CIHI, 2010, p. 76). The average age of graduating practical nurses between 2005 and 2009 was 30.9 years (CIHI, 2010, p. 74). These trends will influence future eligible years of service and will have a significant impact on practice settings in the future. The percentage of internationally educated licensed practical nurses has not significantly changed between 2005 and 2009, remaining at approximately 2%. The majority of these nurses are being educated in the Philippines and United Kingdom (CIHI, 2010, p. xii). Internationally educated nurses must meet regulatory requirements in Canada, which include writing registration examinations and meeting standards of academic preparation. Numerous bridge training programs are available to help qualified immigrants meet these requirements (Government of Ontario [Immigration], 2009).

TABLE A-2
Number and Percentage Distribution
of LPNs Employed in Practical Nursing
by Area of Responsibility, 2009

	Count	Percentage
Total direct care	74,805	98.1%
Geriatric/Long-Term Care	33,087	43.4%
Medical/Surgical	13,860	18.2%
Nursing in Several Clinical Areas	5090	6.7%
Psychiatric/Mental Health	3674	4.8%
Rehabilitation	2885	3.8%
Community Health	2787	3.7%
Home Care	1622	2.1%
Ambulatory Care	1230	1.6%
Palliative Care	1229	1.6%
Emergency Room	1091	1.4%
Operating Room	985	1.3%
Maternal/Newborn	897	1.2%
Pediatric	820	1.1%
Public Health	253	0.3%
Critical Care (Burn)	240	0.3%
Occupational Health	176	0.2%
Oncology	149	0.2%
Other Patient Care	4730	6.2%
Total administration	745	1.0%
Total education	657	0.9%
Total research	33	<0.1%
Total	76,240	100.0%

<0.1%: Value is less than 0.05%; value is replaced to prevent displaying cells of 0.0 that are not true zero values. Nonresponse for Area of Responsibility (% of LPN workforce) n = 704 (1.0%). Totals may not sum to 100% due to rounding.

Source: Modified from Canadian Institute for Health Information (CIHI). (2010). *Regulated nurses: Canadian trends 2005 to 2009* (p. 71, Table 30). Ottawa: Author. Retrieved from <https://secure.cihi.ca/estore/productFamily.htm?locale=en&pf=PFC1565>.

TABLE A-3
Licensed Practical Nursing Workforce, by Jurisdiction and Canada, 2005 to 2009

	2005	2006	2007	2008	2009
NL	2698	2639	2598	2530	2521
PEI	606	599	623	631	665
NS	3127	3174	3160	3250	3357
NB	2633	2646	2734	2731	2729
QUE.	16,293	17,104	17,492	19,581	19,184
ONT.	24,458	25,084	26,126	27,435	28,804
MAN.	2590	2652	2671	2615	2651
SASK.	2194	2224	2381	2514	2629
ALTA.	5313	5614	5986	6232	6669
BC	4884	5412	5791	6705	7577
YT	56	60	59	62	64
NWT	101	92	88	94	94
Canada	64,953	67,300	69,709	74,380	76,944

Note: Totals may not sum to 100% due to rounding. Data released by CIHI may differ from data from other sources due to CIHI's nationally standardized methodology. LPNs employed in a jurisdiction different from their jurisdiction of registration are excluded to avoid duplication. Northern territories data may include interjurisdictional duplicates. Data is not collected for Nunavut.

Source: Canadian Institute for Health Information (CIHI). (2010) *Regulated nurses: Canadian trends 2005 to 2009*, (p. 62, Table 25). Ottawa: Author. Retrieved from <https://secure.cihi.ca/estore/productFamily.htm?locale=en&pf=PFC1565>.

Employment Trends

Practical nursing is one of the largest regulated health care professions in Canada, second only to registered nursing. In 2009, practical nurses represented 22.1% of the total regulated nursing workforce in Canada. CIHI estimated that in 2009, approximately 76,944 practical nurses were employed in Canada. This represents an increase of 18.5% since 2005 (CIHI, 2010, p. xii).

Table A-3 summarizes the number of practical nurses in the workforce for each province and territory from 2005 to 2009.

Employment Status of Practical Nurses. The proportion of full-time positions in practical nursing varies throughout Canada. In 2009, more than half (50.2%) of practical nurses in Canada worked full time; the remainder worked in part-time (33.7%) and casual (16.1%) positions (CIHI, 2010, Table 27, p. 65). The proportion of full- and part-time nurses in the workforce varied among jurisdictions. The highest percentage of full-time practical nurses was in the Northwest Territories, where 86.2% of all practical nurses were employed full-time in 2009. At the same time, Manitoba, in contrast, had the highest percentage of part-time practical nurses (54.7%) (CIHI, 2010, Table 27, p. 65). In 2009, 17.5% of practical nurses worked for several employers, which reveals an interesting trend (CIHI, 2010, Table 28, p. 66).

Workplace Settings. The proportion of practical nurses working in different settings currently varies across Canada. The public may think that practical nurses work exclusively in long-term care settings. This was indeed a key area of employment for about 43.4% of practical nurses in 2009. Only about 6% worked in the community, and approximately 6% worked in other areas (CIHI, 2010, p. 71). According to the CIHI (2010, p. 71), "other" places of employment include business, industry, occupational health care offices, private nursing agencies, private duty, physicians' offices, family practice units, self-employment, schools and other educational

institutions, government, and volunteer associations. It should be noted that practical nurses are also being employed as administrators, educators, and researchers (CIHI, 2010, p. 71).

These trends in workplace settings raise some concerns. If patients requiring nursing care are increasingly found in the community and not in institutions such as hospitals and nursing homes, then why are the numbers of practical nurses in the community or "other" settings so low? Perhaps these statistics reflect reluctance on the part of other health care workers to permit practical nurses to function at the full scope of practice for which they are prepared.

Standards and Scope of Practice

Standards of Practice

As a regulated profession, practical nursing is responsible for establishing its own **standards of practice**. The professional regulatory body for practical nurses in each jurisdiction (e.g., the provincial college of practical nurses) has the authority to set standards of practice for its members. It also has the authority to ensure that members meet these standards.

Standards of practice are written statements that detail the level of performance expected of nurses in a particular jurisdiction. They provide general guidelines about several aspects of professional practice and performance. The practice of any nurse can be continually measured against these standards. They also demonstrate to the public that the profession of practical nursing is dedicated to protecting public safety and providing high-quality care.

Although they differ in details, most standards of practice for practical nurses in Canada offer performance guidelines for the following areas (among others): the nursing process (i.e., assessment, participation in nursing diagnoses, planning, implementation, evaluation), ethics, education, leadership, research, and collaboration with other professionals.

Each individual nurse and the regulatory body are responsible for standards: the nurse for knowing and using them, and the regulatory body for publishing and enforcing them. In addition, the professional association and employers must support these standards in practice and in theory. Finally, members of the public are responsible for being good consumers of the professional health care they receive.

Ethics in Nursing. *Ethics* refers to the moral principles or values that **guide people** when they decide what is right and what is **wrong**. *Ethics* influence behaviour and relationships with other people. Providing ethical nursing care means that the nurse forms a dynamic, caring, helping relationship with the patient in order to help the patient achieve and maintain optimal health.

Regulatory bodies for practical nursing are responsible for establishing and promoting codes of ethics. These codes of ethics guide practical nurses in ethical decision making. They also uphold ethical standards for practical nurses. The following values are promoted in most codes of ethics for practical nurses:

- Being accountable for one's actions
- Upholding the patient's rights to privacy and confidentiality
- Providing care that maintains the patient's dignity
- Demonstrating respect for the patient at all times
- Promoting integrity by providing safe, competent, and ethical nursing care
- Evaluating one's work and maintaining competency

Continuing Education and Expanded Competencies. The practical nurse is expected to continue professional growth and acquire a range of knowledge, skills, and judgement beyond that of the minimal entry-to-practice standards. Many educational opportunities are available to the nurse from postsecondary institutions, professional organizations, employers, and charitable agencies (e.g., the Canadian Diabetic Association). Increasingly, nurses are encouraged to attend educational events offered by other health care providers, such as respiratory therapists, pharmacists, physiotherapists, and gerontologists. This cross-professional education is also immensely valuable in encouraging greater understanding and collaboration among members of the health care team.

Inevitably, nurses in various areas develop different competencies. This presents individual and workplace challenges. As individual competencies are enhanced and scopes of practice are expanded, nurses and employers must continuously seek clarification of their roles. Nurses are accountable for their actions at all times. The employer needs to remain fully aware of the new competencies of nurses, both at entry level and beyond. Employers must also develop clear policies to address the expanded practices of all nursing staff.

Challenges to Working to Full Scope of Practice. Perhaps the best way to maintain competency is to continually use skills and training. Unfortunately, some employers do not allow practical nurses to work to their full scope of practice. For both personal and political reasons, the potential of practical nurses is often not recognized by the health care system. This results in a mismatch between the “scope of employment” and the “scope of practice” that practical nurses are prepared for.

In response to the changing health care system—including employer demand, patient acuity levels, nursing shortages, and professional organizational efforts—many areas do make efforts to allow practical nurses to apply their full scope of practice. This shifts practical nurses from a task orientation to a competency base and, in the process, improves patient care and professional job satisfaction. Optimizing and clearly defining roles for both categories of nurses can also lead to more cost-effective nursing care.

Collaboration

The practical nurse is a team member and thus should always work in a collaborative manner with other health care personnel. Collaboration includes communicating with the patient, the family, and other health care workers to define, implement, and evaluate the plan of care. Collaboration with the patient and family includes focusing on real and perceived needs and wishes and how they intersect with medical and nursing plans. Good working relationships and collaboration between practical nurses and registered nurses in the team are essential in the delivery of quality patient care. The practical nurse also makes suggestions and referrals to individual members of the health care team and in team meetings in which patient care and concerns are discussed. Full understanding of all roles and clear and appropriate communication are integral to effective collaboration within a team.

Scope of Practice

Scope of practice refers to the legal limits of a professional role. Four categories of health care providers give nursing care: unregulated care providers (e.g., nurse’s aides, personal support workers), practical nurses, registered nurses, and

TABLE A-4
Scope of Practice Requirements
for Practical and Registered Nurses
in New Brunswick

	Practical Nurse	Registered Nurse
Entry-level education	Completion of a recognized certification program and successful completion of the Canadian Practical Nurse Registration Examination	Completion of a recognized baccalaureate program and successful completion of the Canadian Registered Nurse Examination
Patient	Educated to provide care to individuals, families, and groups throughout their lifespan, across the continuum of health	Educated to provide care to individuals, families, groups, populations, and communities throughout their lifespan, across the continuum of health
Context of practice	Works as a team member in all settings	Works as an independent practitioner or team member in all settings
Implementation	Coordinates care of less acute, less complex, less variable patients with more predictable outcomes Provides elements of care for highly complex patients in close consultation with the RN coordinating that patient’s care	Coordinates the care of patients regardless of acuity, complexity, variability, and predictability Directs plans of care for highly complex patients

Adapted from Nurses Association of New Brunswick and Association of New Brunswick Licensed Practical Nurses. (2009). *Working together: A framework for the registered nurse and licensed practical nurse* (pp. 10, 11). Retrieved from <http://www.anblpn.ca/English/home/dynamic.cfm?id=92>.

nurse practitioners. Each category of health care provider has its own scope of practice. These scopes of practice are different because each category of health care provider has different education, legal authority, and performance requirements.

In Table A-4, the scopes of practice for practical and registered nurses in New Brunswick are compared. The specific scope of practice may differ among jurisdictions; however, it is common to find that as the complexity, acuity, or variability of a patient increases, practical nurses require more collaboration and support from RNs. This support may initially involve consultation with the RN and may lead to sharing the patient assignment with the RN or the RN taking responsibility for the patient (Licensed Practical Nurses Association of Prince Edward Island, 2011). It may be within a practical nurse’s scope of practice to care for a stable postoperative patient;

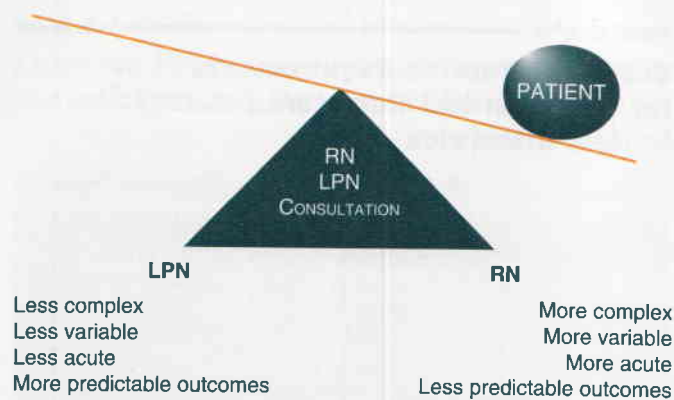


Figure A-1 Balancing patient needs with RN and LPN scope of practice. **Source:** Licensed Practical Nurses Association of Prince Edward Island. (2011). *Exemplary care: Registered nurses and licensed practical nurses working together* (p. 13). Retrieved from http://www.lpna.ca/practice_policy.php.

however, if the patient's vital signs become unstable and urine output decreases below normal limits, the condition of the patient may require care that exceeds that scope of practice. In this case, when the practical nurse recognizes that the patient's condition has become more complex and unpredictable, she or he would consult with the RN and may determine that the patient is experiencing signs of shock and requires physician attention. It is essential that practical nurses and RNs are aware of each other's scopes of practice as this will enhance their ability to work collaboratively to determine and deliver the most appropriate plan of care.

Figure A-1 illustrates how a patient's health needs may call for consideration of the scope of practice of the LPN and RN and may result in a shift in the manner that care is provided.

Boundaries between scopes of practice vary. Between registered and practical nurses, the scopes of practice are much less definitive, and the boundaries are sometimes blurred because both levels of nurses share a base knowledge and practise and develop new competencies during clinical practice. However, the boundaries between practical nurses and unregulated care providers are more definite because little of the basic knowledge or competencies are shared between the two roles.

Leadership: Supervising and Delegating. The practical nurse is often in a position to supervise or to delegate, as well as to be the recipient of **supervision** and **delegation**. In order to supervise and delegate, the practical nurse must have sufficient knowledge, skill, attitude, and judgement. Both supervision and delegation, although different skills, serve to protect the public and the profession by ensuring that a task is performed safely and competently. The same principles of supervision and delegation are applicable to all levels of nurses.

Supervision. Supervision is usually required by individuals who are new to a skill or role, such as students of a profession, new members of a profession, and professionals or nonprofessionals (such as family members or unregulated care providers). The person who is supervising usually has experience in that knowledge and skill, and he or she may or may not be a member of the same profession or occupational group.

Supervision is an intervention and usually an ongoing relationship. The purposes of supervision are (1) to enhance

competent functioning of an inexperienced person and (2) to protect the public and the professional practice. Because supervision requires continual observation, monitoring, and evaluation, the supervisor must have a positive, collaborative relationship with the person being supervised. Both parties in the relationship must understand the roles each must play. The ongoing nature of most supervision allows the relationship to grow and develop. People should be supervised until they can safely perform the task alone. Supervision may occur in many forms, such as a one-on-one observation, an interview with the patient who has received care, or an analysis of the written report of a task. The supervisor provides evaluative information about the task performed as soon as is feasible.

If supervision of a skill occurs in a more isolated instance, the development of a relationship and the analysis of progress are more difficult.

Delegation. In delegation, authority to perform a restricted task or function is transferred to another person or group. The nurse must make this decision carefully. Professional standards are quite clear in this matter. Before delegating a task to another, the nurse must ensure that the person has the required knowledge, skill, and judgement to perform that function. The nurse must consider numerous other factors before a function is delegated to someone else: the associated risks and benefits for the patient, the need for another person to perform the task, the ability of the person to maintain **competence** in the procedure over time, and the ability to provide adequate supervision once the skill has been learned. The Commonwealth of Massachusetts (2011) identifies the "five rights of delegation" for nurses: (1) the right task, (2) the right circumstances, (3) the right person, (4) the right direction or communication, and (5) the right supervision and evaluation. These rights are applicable to nurses working at all levels.

In addition, the nurse must know institutional policies and procedures about delegation and whether the particular function may be legally delegated. This is particularly crucial because of the increasing numbers of unregulated care providers with varied skill sets and functions within the health care system. Responsibility does not stop once a task is delegated to another person. The delegating nurse retains ultimate responsibility for the correct completion of the task. The College of Nurses of Ontario (2009b) developed a useful decision tree to help the nurse decide whether a function can be delegated to another person (Figure A-2).

Clinical Skills. Although graduates of practical nursing programs are prepared to perform skills that are considered entry-to-practice competencies, many factors dictate their ability to do so in the workplace. Medication administration is one of the specific knowledge-based clinical skills that is within the scope of practical nursing in some jurisdictions but may not be in others. Even if it is part of the scope of practice, institutions may be reluctant to allow practical nurses to use this skill. In some areas, boundary issues arise with accompanying confusion about who may administer what medications, to whom, and when. In some jurisdictions, practical nurses may administer injections, monitor intravenous therapy, and administer intravenous medications; in other jurisdictions, they may not. Practice related to clinical skills varies tremendously across the country, between institutions in a region, and even within an institution itself.

Additional Clinical Skills. In most cases, practical nurses can and do acquire other clinical skills beyond those needed for entry to practice. The restrictions on these skills are the

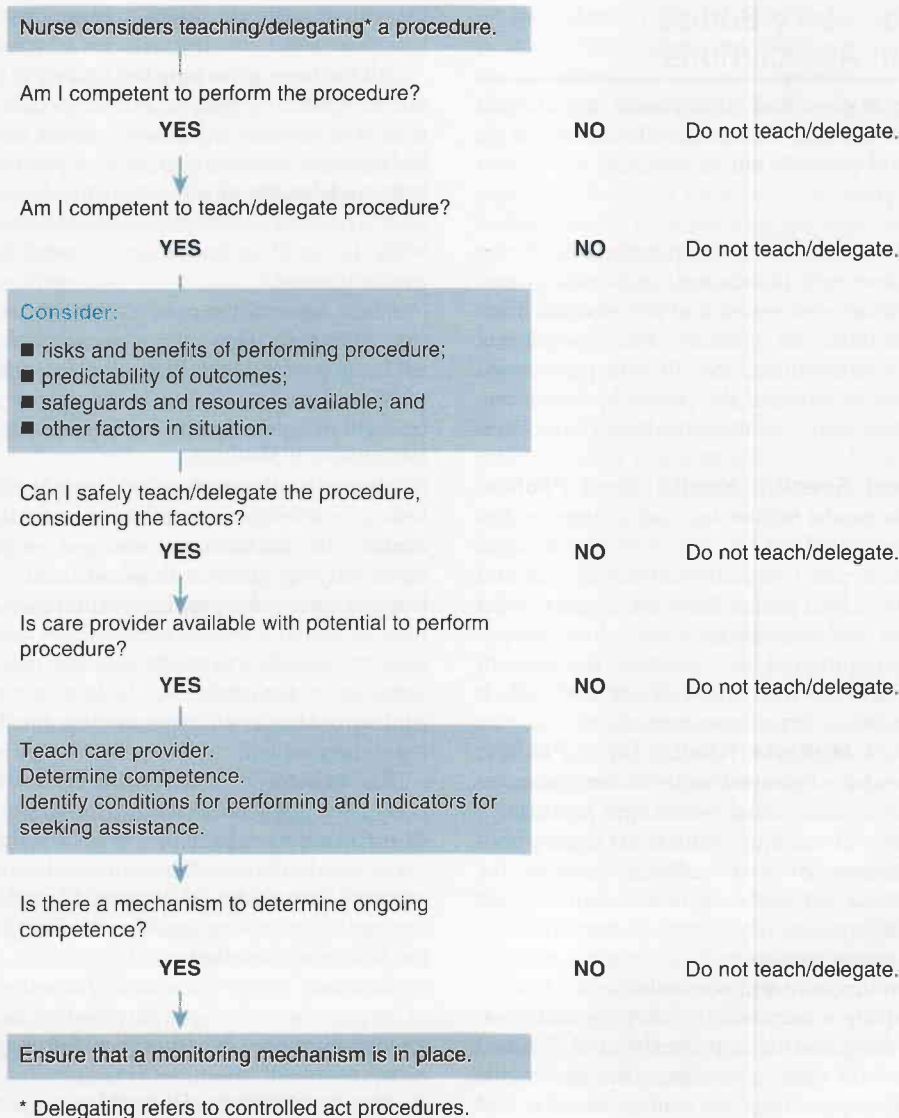


Figure A-2 Decision tree for teaching or delegating performance of a procedure. **Source:** College of Nurses of Ontario. (2009b). *Working with unregulated care providers* (p. 16). Retrieved from http://www.cno.org/Global/docs/prac/41014_workingucp.pdf.

same as those for the registered nurse; the practical nurse must usually take a specific post-basic course to acquire the needed knowledge and skill base and must usually be employed in an area allowing frequent enough application of these skills to maintain continued competency levels. For example, courses are available to learn about various types of dialysis, but entry into these courses is usually confined to those employed or soon to be employed in this area, where they will require the skill and will be able to use it often enough to maintain competency.

Whether an added skill may be practised by a practical nurse is sometimes restricted by legislation or local institutional or regional health care policy, or both. Theoretically, any health care skill that a family member or layperson can be taught should be learned by a nurse, the parameters being the same: a proper knowledge base and demonstrated initial and continued competency and judgement in application of the skill. However, practical nurses need to be aware of the

possible unique legal restrictions on their roles. Whether sensible or not, these legal restrictions do not apply in the same way to family members.

Because the situations necessitating nursing are increasingly complex, variation has arisen in the functions that can be assigned to practical nurses. Some of the more common added competencies for practical nurses in many jurisdictions are operating room techniques, special foot care, orthopedic care, gerontology, community care, and specialized mental health care.

The only commonality appears to be continued rapid change. The nurse must be careful never to assume that standards and scopes of practice are the same within or between institutions, between jurisdictions, or over time. One way to keep pace with change is to keep in close contact with a variety of sources: the professional association, the regulatory body, agency policies, and the ever-expanding body of health care knowledge.

Legislation, Regulatory Bodies, and Professional Associations

Legislation, regulatory bodies, and professional associations govern the practice of nursing. These have been created to protect public safety and promote ethical practice.

Legislation

In most provinces and territories, nursing practice has similar legal regulatory requirements (education, registration, and complaints and disciplinary processes) and professional standards (scope and standards of practice, and competency issues). Laws that govern regulated health care professions serve to protect the best interests of the public by regulating health care practitioners and determining how, what, and where they practise.

Acts That Govern Specific Health Care Professions. In most provinces and territories, each profession has its own governing law, called an *act*. For example, medical doctors, registered nurses, practical nurses, chiropractors, and so forth each are governed by a professional act. These acts list specific tasks that those professionals are allowed to perform because they have the required skills. However, the skills of one profession often overlap with those of another, which causes confusion for public and professionals alike.

Acts That Govern Multiple Health Care Professions. Some provinces have removed or are in the process of removing separate acts for individual health care professions and are replacing them with a single, generic act that applies to all health care professions. In Ontario, this act is called the *Regulated Health Professions Act*, and in British Columbia, it is called the *Health Professions Act*. This trend is occurring for several reasons:

- The public is demanding safe and accountable practice.
- New technology, which is increasingly complex and invasive, is potentially dangerous if improperly used. Trained professionals must, with great care, administer treatments such as radiation therapy, drugs for cancer, surgery, and injections.
- People requiring health care have increasingly complex physical, emotional, and social needs.
- As many professions expand their scope of practice and acquire new knowledge and skill sets, significant overlap in knowledge and skills occurs between various groups. These general health care acts are an attempt to apply a regulatory structure common to all groups.
- Health care professionals are more mobile today (i.e., they move between jurisdictions) and may have wide variations in knowledge and competence.
- The number and variety of health care professions have increased.
- These generic health care acts list (1) professions that are regulated by the law and (2) activities that only members of certain professions are authorized to perform. These activities refer to restricted actions that would be considered to be potentially harmful if performed by anyone other than a qualified professional. They are identified as **controlled acts** (in Ontario) and **reserved acts** (in British Columbia).

Different health care professions are legally permitted to perform certain restricted activities. For instance, diagnosing a disease is a controlled act that is usually restricted to the medical profession, while administering a substance by injection is an act that can usually be performed by nurses. In

Ontario, the *Regulated Health Professions Act* lists 13 controlled acts, 3 of which can be performed by nurses (CNO, 2009a).

All the laws governing the actions of health care professionals, whether they are profession-specific acts or generic health care acts, include statements about the type of educational background necessary to enter a professional school and the type and length of education the professional schools must offer. The laws also require the profession to set up a governing body to monitor and regulate professional practice in the public interest.

These laws may seem excessively cumbersome and confusing. However, they are a reasonable attempt to establish uniform professional competencies and thereby protect the public.

Regulatory Bodies

According to the professional and health care acts, each profession must have a regulatory body that governs it. As the health care environment changes, regulatory bodies adapt by modifying practice standards and guidelines accordingly. Depending on the province or territory, this regulatory body may be called a *college*, a *council*, an *association*, or a *board*. Its primary mandate is to protect the public by controlling the activities of the professionals. In order to practise or use their professional title, all professionals must be members of their regulatory body.

Functions of the Regulatory Body. Each regulatory body uses many methods to protect the public. It ensures that its members have been properly educated; meet the minimum entry standards; maintain continued competence; and have the required knowledge, skill, attitude, and judgement to practise the particular profession. Almost all regulatory bodies perform the following functions:

- Ensuring that professionals have the necessary credentials to practise in the specific province or territory
- Determining whether qualifying examinations are necessary
- Registering the professional as a member of the profession once all criteria for membership have been met
- Keeping a public register of the names, registration numbers, and business addresses of all members
- Defining scope of practice and competency standards, according to professional standards and the existing laws
- Ensuring that members renew or update registration and maintain competency criteria on a regular basis
- Receiving complaints from the public or other professionals about personal practices of members, investigating these complaints, and disciplining members as necessary
- Publishing disciplinary results regularly (i.e., name, registration number, offence, and disciplinary decision)
- Approving practical nursing programs in their jurisdiction

Because the names, registration numbers, and business addresses of registered health care providers are made public, some people have expressed concern that members' right to privacy is compromised. However, regulatory bodies and most provincial and territorial governments believe this information is necessary for public safety. Therefore, they consider that protecting the public safety supersedes the provider's right to privacy. In many areas, governments also permit the publication of disciplinary action against a health care provider, believing that doing so fulfills this mandate of serving the best interests of the public.

Protecting or Reserving Titles. Usually, regulatory bodies are also responsible for ensuring that the members' professional title (e.g., LPN, Dr.) is protected, or reserved. This means that only registered members are authorized to call themselves by the professional title. The protected title is usually related to the terms used in the jurisdiction, but protection is usually also extended to other, synonymous terms. For example, in Ontario, all the following related terms and abbreviations are protected: *nurse*, *registered practical nurse*, *RPN*, *LPN*, *PN*, and their variants.

The provincial or territorial college of licensed practical nurses is the provincial regulatory body responsible for superintending the profession of licensed practical nursing in the public interest. As such, the college sets the requirements for the privilege of using the professional titles related to licensed practical nurses. The professional title assures the public and other care providers that the individual has been evaluated and found capable of practising within the established standards.

In all provinces and territories (except Ontario), the official designation of the practical nurse is *licensed practical nurse* (LPN). In Ontario, the official designation is *registered practical nurse* (RPN).

Obtaining Criminal Record Checks. Because professionals have positions of power, concerns have inevitably arisen that they could take advantage of vulnerable people, especially young children and older adults. In response, provinces and territories require individuals registering with a regulatory body to undergo a criminal record check.

Self-Regulation. To what extent should governments be involved in the regulation of a health care profession? Surely professionals are capable of regulating themselves and do not require paternalistic interference from government bureaucrats. The public good must be balanced with individuality, as must government laws with professional input. Professional self-regulation in nursing means that each nurse is expected to assume personal responsibility for maintaining competence and personal, physical, social, and emotional fitness to practise. Self-regulation also means that nurses establish standards of practice and an ethical framework for the nursing profession as a whole.

Self-regulation is a privilege that is entrusted to a regulating college in order to serve and protect the public interest:

The college establishes requirements to enter the profession and assures the quality of the practice of LPNs through the development and enforcement of standards of practice and continuing competence programs. (College of Licensed Practical Nurses of Manitoba, 2011)

The Registration Process for the Practical Nurse (Credentialling). In all territories and provinces of Canada, registration with the local regulatory body must proceed through a specific process. The regulatory body (also called a *registering body*) in each jurisdiction determines whether the applicant has sufficient educational background and competency for registration in the particular area. To be registered as practical nurses, applicants must prove that their education meets requirements for theoretical and clinical hours in specified topics and clinical areas. They also must provide evidence of competent practice by passing a licensing examination, providing evidence of recent competent work in the practical nursing field, or both. As already noted, in many jurisdictions, applicants must also pass a criminal record check before registering to practise.

Registering Locally. Successful graduates of a practical nursing school submit their names to the local licensing authority for permission to write the national certification examination, the Canadian Practical Nursing Registration Examination. As a general rule, students must write the certifying examination in the province or territory in which they received their education because their local registration body must recommend them to write the examination. The students are notified of where and when examinations will be written. After the examination is written, the student is notified of the results by mail. Usually, the school receives a summary of the passing and failing marks in that class and information about their success in relation to other schools in the jurisdiction and country. Privacy of examination marks is an issue in many areas. In Ontario, for instance, students must sign a waiver allowing their examination results to be included in the information sent to their educational institution. When the examination results are sent to the school, the student names are obscured.

After passing the licensing examination and (if required) completing a criminal record check, the new graduate then applies to the regulatory body to be registered as a practical nurse.

Registering in Another Province or Territory. Just as they would in their own jurisdictions, applicants wanting to register in a province or territory in which they have not been educated must formally apply for registration. This generally means the applicants must submit official transcripts from their school, indicating both hours and topics of theory and practice they completed in the basic program. They must show competent practice by submitting a record of success in the national certification examination or its equivalent from another country. If they are not recent graduates, they must also provide evidence of a sufficient amount of recent (within the previous three to five years) appropriate work in practical nursing. If they have not already done so, they may have to complete a criminal record check. If the certification examination, educational background, or recent nursing experience is not accepted by the regulatory body, then the applicant may be required to write the Canadian examination and take theoretical or clinical nursing courses to upgrade to Canadian standards.

Registering in Other Countries. The registration process for the United States and the United Kingdom is very similar to the Canadian process. The applicants must prove to the foreign regulatory body that (1) they have successfully completed a basic nursing education program that includes a specified number and type of theoretical and clinical hours, and (2) they are capable of competent nursing practice (i.e., they have successfully written the examination or have recent practical experience, or both). Countries vary in how they accept marks on Canadian certification examinations and hours in clinical and theoretical basic nursing programs. In the United States, nurses are certified in the specific state or territory; in the United Kingdom, nurses are certified nationally.

Practical nurses planning to relocate to another jurisdiction (country, state, or province) should contact the new registering or licensing body well in advance because this body may have different requirements for professional practice. The procedure for attaining registration in a new jurisdiction can take up to three months in the absence of complications or deficiencies, but it can take much longer if problems exist.

Professional Associations

In Prince Edward Island and Ontario, the professional association is separate from the regulatory body (e.g., the College of Nurses of Ontario is the regulatory body, and the Registered Practical Nurses Association of Ontario is the professional association). However, in all other provinces and territories, they are the same body. The purpose of most professional associations is to advocate for and promote the particular profession they serve. The objectives of the Registered Practical Nurses Association of Ontario (2011b) include the following:

- To advocate for RPNs in diverse settings, resulting in optimum patient health services through policy, legislation and regulation
- To advocate for quality, respectful working environments for RPNs
- To enhance the professional competencies of RPNs by ensuring the research, development, and delivery of quality educational programs
- To promote the benefits of membership to RPNs in order to ensure a strong and unified professional voice
- To promote a closer working relationship with other health and related organizations
- The fundamental differences between a regulatory body and a professional association have been highlighted. Protection of the public is the distinct mandate of the regulatory body, whereas promoting professional development is the mandate of the professional association. Many nurse leaders and politicians believe that regulatory bodies and professional associations should not be combined because doing so may lead to public confusion and conflicts of interest. In the interests of both professional issues and public accountability, the professional association and regulatory body must remain in continuous, effective communication.

Practical nurses in provinces and territories that do not have a professional association separate from the regulatory body can access the Canadian Practical Nurses Association (CPNA) for professional advocacy and promotion issues. Unlike membership in the regulatory body, membership in the professional association is usually voluntary.

The Canadian Association of Practical Nurse Educators, an affinity group of the nationwide Association of Canadian Community Colleges, offers educational and networking opportunities and holds yearly conferences for educators throughout Canada.

Benefits of Membership in the Professional Association. Members of professional associations enjoy the following benefits:

- Receiving emotional support from other professionals by sharing thoughts, feelings, and ideas
- Enhancing a personal and collective knowledge base, thus contributing to individual and group growth
- Being part of a strong force for change (groups often lobby for change more effectively than do individuals)
- Achieving some economic advantages (e.g., better insurance rates through a group plan)
- Having opportunities to network

In summary, nursing is a complex profession that exists in a challenging environment under constant legal and professional changes. No nurse works alone; he or she is always in an environment with the public and other health care providers. Each nurse must understand how legislation, regulatory

bodies, and professional associations work together to inform safe and competent practice.

The Future of Practical Nursing in Canada

It is not possible to know the future of practical nursing definitively, but it is possible to make reasonable predictions on the basis of current and projected trends. The health care system in Canada is continually changing, and these changes have an effect on practical nursing. Both Abbot (1988) and Wilson (1992) believed that organisms and professions that do not respond to change lose their niche positions and either fade to unimportant entities controlled by others or die out completely. According to Wilson, "Homogeneity means vulnerability" (p. 301). In order to cope effectively, nurses must be **proactive** and view change as a challenge and an opportunity rather than a threat. By doing so, nursing will maintain or advance its niche position in health care.

General Health Care Trends

A number of current and projected changes can potentially affect practical nursing. The following issues each have an impact on the delivery of health care services in Canada:

- Rising costs of health care; the individual consumer will need to pay more
- Increased privatization of health care with less government funding
- Increased use of technology, including robotics for treatment and computer technology for communications, documentation, and teaching
- Expanded public access to information
- Increased population diversity
- Stronger public demands for a voice in health care and competent health care services
- Increased medical legal litigation
- Higher percentage of older adults in the population
- Trends toward postacute care, rehabilitation, palliative care, long-term care, and chronic care in the home rather than in hospitals or other institutions
- Increased acuity of admitted patients
- Proliferating interprofessional models for health care

In the Canadian Nurses Association's report *Toward 2020: Visions for Nursing*, Villeneuve and MacDonald (2006) identified trends that will affect Canadian nurses of the future. They predicted that by 2020, chronic diseases and virulent infectious diseases would increase in number, health care would focus on wellness promotion, more health care would take place in homes and communities, interdisciplinary care would be the norm, technology would continue playing a major role in health care, foreign-trained nurses would be integrated into the Canadian workforce, and nursing credentials from different provinces and territories would be accepted across Canada.

Specific Health Care Issues in Canada

The Romanow report (Government of Canada, 2002) offered several suggestions about the unique needs of Canadians that affect practical nursing:

- Government should increase strategies that promote physical activity and reduce obesity.
- Efforts to reduce smoking should be expanded.

- Immunization programs should be given closer attention, especially in response to new infectious diseases and increased population mobility between countries.
- Services to new Canadians, visible minorities, people with disabilities, Aboriginal people, and rural and isolated populations should be given more attention and funding.
- Home care is one of the fastest-growing sectors of the health care system; investing more in home care will improve services and quality of life for home care patients and will also save the system money by keeping people out of hospitals and long-term care facilities.
- Better services should be provided in mental health care, postacute care, rehabilitation, and palliative care.
- A national approach to human resources planning for health care should be developed so that one province does not “poach” scarce health care providers from other provinces.

Implications for Practical Nursing

Continuous rapid change requires professionals to respond appropriately in order to cope effectively. Practical nurses need to be lifelong learners and develop increasingly broad-based competencies to adapt to changing occupational demands. This is not the time to focus solely on one narrow skill set or to cling stubbornly only to the knowledge base acquired in undergraduate school.

Modern technological treatment is increasingly expensive and time intensive. Practical nurses have the knowledge, abilities, attitudes, and skills to contribute significantly to newly evolving primary health care models. Practical nurses of the future will likely need to have increased knowledge of **epidemiology** and to play a greater role in illness prevention, health promotion, and health teaching for patients throughout the lifespan. For instance, nurses will likely be required to provide information to reduce infectious and chronic lifestyle-related diseases such as cancer, diabetes, obesity, and heart-lung disorders. Health teaching for individuals and groups in the areas of diet, exercise, and reducing high-risk habits such as smoking will become increasingly important. Practical nurses will continue to need to focus on patients and empower them to be active participants in their own health care. Because health care problems are often too complex to be addressed by any one person, practical nurses will need to focus more on working collaboratively in teams and networks of health care providers. The trend toward interdisciplinary health care models will require nurses to be increasingly aware of scope of practice and of changes in scope of practice among all workers. Because of this emphasis on collaborative teamwork, outcome-based care frameworks (in the text, called care maps or critical pathways) will probably be emphasized over more narrow frameworks unique to only one profession (such as the nursing care plan). Having all health care team members work from the same model would simplify care issues and reduce the chance of error.

As more health care services are offered by the private sector, nurses will likely encounter different and challenging ethical issues. Nurses will need to be more aware of conflicts of interest. They may find that their professional values clash with corporate interests. In this regard, professional colleagues and the professional association will become increasingly important sources of information and support. Practical nurses will have to consider strengthening their national association

and, in some provinces and territories, having more direct and local input in their provincial or territorial association.

The increased use of computers in health care is resulting in remarkable advances in health informatics systems. Computer use has become the norm rather than the exception in most health care institutions. Practical nurses will need to become skilled in the use of electronic medical health record systems, which can involve documentation and full access to current and past medical records, diagnostic test results, and digital radiographic images. New technologies are changing bedside care as nurses begin to use personal digital assistants (PDAs), mobile or cell phone pagers, computerized medication administration systems, online educational resources, and telemedicine systems. Computer literacy will be essential for practical nurses of the future. Nurses work with an increasingly diverse and multicultural population base. Practical nurses of the future will thus have to develop more knowledge and skill in applying concepts from the humanities and social sciences such as psychology, sociology, and anthropology.

Possible Evolution of the Practical Nurse Role

Changes in Educational Standards for Entry to Practice. In view of the likely expanding roles for the practical nurse, a high school diploma will continue to be the minimum requirement for entry into a practical nursing program. The applicant must have a firm grounding in communication skills (written and oral), as well as in advanced sciences to cope with the increased scientific base of nursing. Some knowledge of or fluency in a second language would be useful in this increasingly multicultural society.

Practical nurse education programs need to be at least two academic years in length and must occur in a postsecondary institution that meets general program standards for preparing professionals to meet entry-to-practice requirements. These programs must be academically sound and include components of pure science, social science, and humanities. The curricula must also incorporate interprofessional education. Should the practical nurse decide to continue with studies in registered nursing, the practical nursing program should be accepted in whole or in part toward a university baccalaureate program. As noted earlier in this chapter, “laddering” into registered nursing is not the only option for practical nurses to enhance their professional careers. Many opportunities exist for nurses to gain expertise in specific health care areas while retaining a practical nursing identity. Practical nurses with advanced skill sets become valuable members of the health care team.

Should a university degree in practical nursing be available? Some places in the United States offer degrees in practical nursing, but this raises some questions. If university degrees become common, what would be the difference between practical nursing and registered nursing? Would the levels of nurses and their currently separate scopes of practices become even more blurred, or would they merge? Does the public need two very similar practitioners with the same education?

If practical nurses required degrees, this would mean registered nurses would be required to have master’s degrees. A master’s degree might even become a requirement for entry to practice for the registered nurse. This is already happening in the United States and much of Canada, where a master’s degree in nursing is required for almost all entry-level teaching or administrative positions and most nurse

practitioner (registered nursing extended class) positions. This scenario may appeal to health care agencies because they could employ more practical nurses, presumably for less cost than the same number of registered nurses. However, if university degrees in practical nursing were required, professionals educated at this level would demand higher pay and the health care system would not be much further ahead economically.

Will practical nursing remain a recognized health care profession, or will it be swallowed up by professions on either side of it (the registered nurse with baccalaureate degrees on one side and the unregulated care providers on the other)? If practical nursing fails to maintain or expand the knowledge base, then unregulated care providers may begin to absorb nursing competencies into their own skill set.

Scope of Practice and New Competencies. The practical nursing profession faces an exciting future. The practical nursing scope of practice will continue to evolve in response to changes in the Canadian health care system. CNA's *Toward 2020* report (Villeneuve & MacDonald, 2006) proposed that the structure of the health care system and the delivery of nursing by regulated nursing professions will be very different in the future. They predicted that by 2020, registered nurses would undertake more of the primary care that is currently provided by general practitioners. If this becomes reality, how will it affect the role of practical nurses? The report also predicted that by 2020, the proportion of practical nurses would increase and that the majority of nurses would work in community settings and in multidisciplinary teams. It suggested that practical nurses would play a greater role in preoperative, preprocedure, and perioperative settings and would be primarily responsible for rehabilitation and long-term care, with the assistance of personal support workers. Acute care in 2020 was further envisioned as consisting of a combination of all categories of nurses (Villeneuve & MacDonald, 2006). Despite changes in roles, collaborative practice between RNs and practical nurses will continue to be an important component in health care delivery.

Practical nurses of the future will continue to acquire separate postgraduate competencies in specific areas through post-basic education and on-the-job training and experience. In the future, more of these competencies may involve community health care, consultations and advice by telephone ("tele-health"), disease prevention (epidemiology), rehabilitation, palliative care, special needs populations, and health teaching opportunities for groups and individuals. Practical nurses will also probably have many opportunities to work with multicultural groups, including new immigrants, Aboriginal and other indigenous people, and rural populations, and they will continue to work in long-term and chronic care settings.

If professionals in acute care increase their use of the critical pathway (care map) system, practical nurses could have expanded roles in areas such as intensive care units. They would be able to work with more unstable patients because the critical pathway system allows for more interdependence and collaboration, technological and personnel help, and distinct instructions for care and consultation. The registered nurse would continue with the role of case manager.

Currently, registered nursing requires a greater depth of knowledge and a broader practice base than does practical nursing, and it exerts great influence on scope of practice among all categories of nurses. Practical nursing associations of the future will persist in addressing strategies to challenge restrictions imposed by other nursing groups. As all categories

of nursing professions face the future, it is imperative that they engage in dialogue and planning to ensure that their future roles and scopes of practice most effectively serve all stakeholders in the Canadian health care system.

What Is the Final Answer?

What will happen to practical nursing in the future? No one knows for certain, but ecological and sociological studies of professions indicate that individuals and groups—both animal and human—grow, develop, change, flourish, fade out, and disappear. According to Wilson (1992), "Environment is the theatre and evolution is the play" (p. 80).

Practical nurses and registered nurses are likely to always maintain separate scopes of practice for survival reasons. But practical nursing can strengthen its position by developing more diverse and specialized competencies in this changing society. It must develop competencies that address the needs of the environment. It must change to meet health care demands. For nurses, health care—more specifically, nursing—is the theatre, and constant change is the play. If practical nurses wish to maintain their particular niche in the health care system, it is essential that they respond effectively in this environment of continued rapid change.

✦ KEY CONCEPTS

- Practical nursing is the second-largest group of regulated health care providers in Canada.
- After the Second World War, nursing registration laws were amended to create two levels of nursing practice.
- Practical nursing was recognized as a distinct profession that necessitates formal education in the 1970s.
- Education programs for practical nurses have become longer and more complex and have moved from hospital settings to postsecondary institutions.
- Ecology theory describes the need for a group to compete for niches and evolve to cope effectively with environmental changes.
- In most Canadian jurisdictions, practical nursing programs are diploma programs that run for two academic years and are offered at postsecondary institutions.
- The main difference between registered nurses and practical nurses is the scope of their knowledge base.
- Practical nurses have a strong foundation in clinical practice, decision making, and critical thinking.
- Practical nurses work in a range of settings, including direct care, administration, education and research.
- As a regulated profession, practical nursing is responsible for establishing its own standards of practice.
- Practical nurses are expected to continue professional growth and acquire a range of knowledge, skill, and judgment beyond that of minimal entry-to-practice standards.
- Delivery of cost-effective nursing care considers optimizing scope of practice and clearly defining roles for both categories of nurses.
- Self-regulation is a privilege that is entrusted to a regulating body in order to serve and protect the public interest.
- Continuous change in the health care system requires the practical nursing profession to adapt in regard to entry to practice and scope of practice.

✦ CRITICAL THINKING EXERCISES

1. According to the CNA's *Toward 2020* report, the delivery of nursing by regulated nursing professionals will be different in

- the future. If, by the year 2020, registered nurses begin to play a larger role in primary health care, how will that affect the future roles of practical nurses and personal support workers? How would you design the human resources structure of the Canadian health care system of the future?
- Noreen, the manager of a surgical unit, is reviewing her tight budget and staffing complement. One-quarter of her staff consists of practical nurses and the remainder consists of RNs. The responsibilities of the practical nurses have not changed on her unit for the last 10 years. Based on what you know about scope of practice and delegation, what suggestions would you have for Noreen? What resources would you suggest that she access?
 - A newly graduated practical nurse is caring for a patient after a total knee replacement. Eight hours after the patient's return to the unit, he begins to complain of shortness of breath and chest pain on inhalation. The nurse identifies that oxygen saturation levels are falling and air entry is decreased to the patient's left lower lobe. The nurse has never encountered this type of a situation before. Describe how the practical nurse and RN can partake in consultation and collaboration in this situation.
- ### ❖ REVIEW QUESTIONS
- In order to identify him/herself with the title of licensed practical nurse (LPN) or registered practical nurse (RPN), a nurse must
 - Have completed an accredited practical nursing program
 - Be registered with a provincial regulatory body
 - Pass the Canadian Practical Nursing Registration Examination
 - Have procured employment as a practical nurse
 - The scope of practice for practical nurses
 - Varies between jurisdictions across Canada
 - Is limited to caring for stable patients
 - Is mandated by federal legislation
 - Has remained unchanged over the last decade
 - According to ecological theory, surviving groups
 - Establish limited niches
 - Cope with environmental change
 - Remain homogeneous
 - Avoid hybridization
 - Which of the following depicts the concept of laddering in health care education?
 - An LPN advances herself by taking an IV course.
 - An LPN begins an RN program pathway that gives consideration to his previous education and experience.
 - An LPN who has taken business courses is promoted to the position of team leader.
 - An LPN obtains her certification as a wound care specialist.
 - In Canada, practical nursing was established in which decade as a distinct profession that required a formal education?
 - 1900s
 - 1930s
 - 1970s
 - 1990s
 - Which of the following health care providers is not licensed under law in Canada?
 - Personal support worker
 - Practical nurse
 - Registered nurse
 - Nurse practitioner
 - Workforce and employment trends for practical nurses in Canada reveal that
 - Practical nurses are the second-largest group of regulated health care providers in Canada
 - The vast majority of practical nurses are employed in part-time positions
 - Practical nurses work exclusively in long-term care settings
 - The number of practical nurses is not being affected by the nursing shortage
 - In most Canadian jurisdictions, practical nurses graduate from
 - Certificate programs
 - Two-year college diploma programs
 - Three-year degree programs
 - Direct practice hospital programs
 - The activities that practical nurses are educated and authorized to perform are outlined in
 - Entry-to-practice competencies
 - Their scope of practice
 - Terminal outcomes
 - National law
 - Which of the following are included in most codes of ethics for practical nurses?
 - Controlled acts
 - Upholding the patient's rights to privacy and confidentiality
 - Guidelines for documentation
 - Processes for delegation

Review Question Answers

1. 2. 2. 1. 3. 2. 4. 2. 5. 3. 6. 1. 7. 1. 8. 2. 9. 2. 10. 2

Appendix B Laboratory Values

Adapted by Jennifer E. Cooke*

The tables in this appendix list some of the most common tests, their normal values, and possible etiologies of abnormal values. Laboratory values are expressed in the *Système Internationale d'Unités* (SI units) that are used in Canada. Conventional units, used in the United States, are presented in parentheses after the SI units. Laboratory values may vary with different techniques or different laboratories. Possible etiologies are presented in alphabetical order. Abbreviations appearing in the tables are defined as follows:

| | | | | | |
|------|---|---|-------|---|--|
| < | = | less than | mcmol | = | micromole |
| > | = | greater than | mcU | = | microunit |
| ≥ | = | greater than or equal to | mEq | = | milliequivalent |
| AU | = | arbitrary unit | mg | = | milligram (10^{-3}) |
| dL | = | decilitre | mL | = | millilitre |
| EU | = | ehrlich unit | mm | = | millimetre |
| fL | = | femtolitre | mm Hg | = | millimetre of mercury |
| g | = | gram | mmol | = | millimole |
| IU | = | international unit | mOsm | = | milliosmole |
| kPa | = | kilopascal | nmol | = | nanomole |
| L | = | litre | ng | = | nanogram (one-billionth of a gram) (10^{-9}) |
| mcg | = | microgram (one-millionth of a gram) (10^{-6}) | pg | = | picogram (one-trillionth of a gram) (10^{-12}) |
| mkat | = | microkatal | pmol | = | picomole |
| mL | = | microlitre | U | = | unit |

TABLE B-1
Serum, Plasma, and Whole Blood Chemistries

| Test | Normal Values | | Possible Etiology | |
|-------------------------|--|--|--|--|
| | SI Units (Conventional Units) | Higher | Lower | |
| Acetone | | Diabetic ketoacidosis, high-fat diet, low-carbohydrate diet, starvation | | |
| Quantitative | <200 mcmol/L (<1.16 mg/dL) | | | |
| Qualitative | Negative (Negative) | | | |
| Albumin | 35–50 g/L (3.5–5 g/dL) | Dehydration | Burns, chronic liver disease, malabsorption, malnutrition, nephrotic syndrome, pregnancy | |
| Aldolase | 22–59 mU/L (3–8.2 Sibley-Lehninger U/dL) | Infection, muscle trauma, skeletal muscle disease | Late muscular dystrophy, renal disease | |
| α_1 -Antitrypsin | 0.85–2.13 g/L (85–213 mg/dL) | Acute and chronic inflammation and infection, arthritis, malignancy, stress syndrome, thyroid infections | Chronic lung disease (early onset of emphysema), malnutrition, nephrotic syndrome | |
| α_1 -Fetoprotein | <40 mcg/L (<40 ng/mL) | Cancers of testes and ovaries, carcinoma of liver, neural tube defects or multiple pregnancies in pregnant women | In pregnant women, trisomy 21 or fetal distress/death | |

*Adapted from Lewis, S. M., McLean Heitkemper, M., Dirksen, S. R., Goldworthy, S., Barry, M.A., & Goodridge, D. (2010). *Medical-surgical nursing in Canada* (2nd Canadian ed.). Toronto: Elsevier Canada.

TABLE B-1
Serum, Plasma, and Whole Blood Chemistries—cont'd

| Test | Normal Values | | Possible Etiology | |
|--|--|---|---|--|
| | SI Units (Conventional Units) | Higher | Lower | |
| Ammonia | 6–47 mmol/L (10–80 mcg/dL) | Gastrointestinal bleeds, hepatic encephalopathy, portal hypertension, severe liver disease | | |
| Amylase | 30–220 U/L (60–120 Somogyi units/dL) | Acute and chronic pancreatitis, mumps (salivary gland disease), perforated ulcers | Acute alcoholism, cirrhosis of liver, extensive destruction of pancreas | |
| Ascorbic acid | 23–85 mmol/L (0.4–1.5 mg/dL) | Excessive ingestion of vitamin C | Connective tissue disorders, hepatic disease, renal disease, rheumatic fever, vitamin C deficiency | |
| B-type natriuretic peptide | <100 ng/L (<100 pg/mL) | Heart failure, myocardial infarction, hypertension, cor pulmonale | | |
| Bicarbonate | 21–28 mmol/L (21–28 mEq/L) | Chronic use of loop diuretics, compensated respiratory acidosis, metabolic alkalosis | Acute renal failure, compensated respiratory alkalosis, diarrhea, metabolic acidosis | |
| Bilirubin | | Biliary obstruction, hemolytic anemia, impaired liver function, pernicious anemia, prolonged fasting | | |
| Total | 5.1–17 mmol/L (0.3–1.0 mg/dL) | | | |
| Indirect | 3.4–12 mmol/L (0.2–0.8 mg/dL) | | | |
| Direct | 1.7–5.1 mmol/L (0.1–0.3 mg/dL) | | | |
| Blood gases* | | | | |
| Arterial pH | 7.35–7.45 (same as SI units) | Alkalosis | Acidosis | |
| Venous pH | 7.31–7.41 (same as SI units) | Alkalosis | Acidosis | |
| Arterial PCO ₂ | 35–45 mm Hg (same as SI units) | Compensated metabolic alkalosis, respiratory acidosis | Compensated metabolic acidosis, respiratory alkalosis | |
| Arterial PO ₂ | 80–100 mm Hg (same as SI units) | Administration of high concentration of oxygen | Chronic lung disease, decreased cardiac output | |
| Venous PO ₂ | 40–50 mm Hg (same as SI units) | | | |
| Calcium | 2.25–2.75 mmol/L (9–10.5 mg/dL) | Acute osteoporosis, hyperparathyroidism, multiple myeloma, vitamin D intoxication | Acute pancreatitis, hypoparathyroidism, liver disease, malabsorption syndrome, renal failure, vitamin D deficiency | |
| Calcium, ionized | 1.05–1.30 mmol/L (4.5–5.6 mg/dL) | | | |
| Carbon dioxide (CO ₂ content) | 21–28 mmol/L (21–28 mEq/L) | Same as bicarbonate | | |
| β-Carotene | 1.4–4.7 mmol/L (75–253 mcg/dL) | Cystic fibrosis, hypothyroidism, pancreatic insufficiency | Dietary deficiency, malabsorption disorders | |
| Chloride | 98–106 mmol/L (98–106 mEq/L) | Corticosteroid therapy, dehydration, excessive infusion of normal saline, metabolic acidosis, respiratory alkalosis, uremia | Addison's disease, heart failure, diarrhea, metabolic alkalosis, overhydration, respiratory acidosis, SIADH (syndrome of inappropriate antidiuretic syndrome), vomiting | |
| Cholesterol | <5.2 mmol/L (<200 mg/dL) age dependent | Biliary obstruction, cirrhosis, hypothyroidism, hyperlipidemia, idiopathic hypercholesterolemia, renal disease, uncontrolled diabetes | Corticosteroid therapy, extensive liver disease, hyperthyroidism, malnutrition | |
| HDL (high-density lipoproteins) | | | | |
| Male | >0.75 mmol/L (>45 mg/dL) | | | |
| Female | >0.91 mmol/L (>55 mg/dL) | | | |
| LDL (low-density lipoproteins) | <3.37 mmol/L (<60–180 mg/dL) | | | |
| Cholinesterase (RBC) | 5–10 U/L (same as SI units) | Exercise, sickle cell disease | Acute infections, insecticide intoxication, liver disease, muscular dystrophy | |
| Pseudocholinesterase (serum) | 8–18 U/mL (same as SI units) | | | |
| Copper | 11–22 mmol/L (70–140 mcg/dL) | Cirrhosis, contraceptive use by female patient | Wilson's disease | |

*Because arterial blood gases are influenced by altitude, the value for PO₂ decreases as altitude increases. The lower value is normal for an altitude of 1.6 km (1 mile).

TABLE B-1

Serum, Plasma, and Whole Blood Chemistries—cont'd

| Test | Normal Values | | Possible Etiology | |
|--|--|---|--|--|
| | SI Units (Conventional Units) | Higher | Lower | |
| Cortisol | 8 AM: 138–635 nmol/L
(5–23 mcg/dL)
8 PM: <83–359 nmol/L
(3–13 mcg/dL) | Adrenal adenoma, Cushing's syndrome, hyperthyroidism, pancreatitis, stress | Addison's disease, adrenal insufficiency, hypopituitary states, hypothyroidism, liver disease | |
| Creatine | 15.3–76.3 mcmol/L
(0.2–1.0 mg/dL) | Active rheumatoid arthritis, biliary obstruction, hyperthyroidism, renal disorders, severe muscle disease | Diabetes mellitus | |
| Creatine kinase (CK) | | | | |
| Male | 55–170 U/L (same as SI units) | Brain damage, exercise, musculoskeletal injury or disease, myocardial infarction, numerous intramuscular injections, severe myocarditis | | |
| Female | 30–135 U/L (same as SI units) | Acute myocardial infarction | | |
| CK-MB (CK-2) | Male: 2–6 mcg/L (2–6 ng/mL)
Female: 2–5 mcg/L (2–5 ng/mL) | | | |
| CK mass fraction | <0.05 fraction of total CK | | | |
| Creatinine | | Severe renal disease | Diseases with decreased muscle mass (e.g., muscular dystrophy, myasthenia gravis) | |
| Male | 53–106 mcmol/L (0.6–1.2 mg/dL) | | | |
| Female | 44–97 mcmol/L (0.5–1.1 mg/dL) | | | |
| Ferritin (serum) | | Anemia of chronic disease (infection, inflammation, liver disease), sideroblastic anemia | Iron-deficiency anemia, severe protein deficiency | |
| Male | 12–300 mcg/L (12–300 ng/mL) | | | |
| Female | 10–150 mcg/L (10–150 ng/mL) | | | |
| Folic acid (folate) | 11–57 nmol/L (5–25 ng/mL) | Hypothyroidism, pernicious anemia | Alcoholism, hemolytic anemia, inadequate diet, malabsorption syndrome, malnutrition, megaloblastic anemia | |
| γ -Glutamyltranspeptidase (GGT) | 8–38 IU/L (same as SI units) | Cholestasis, <i>Cytomegalovirus</i> infection, Epstein-Barr, liver disease, myocardial infarction, pancreatitis | | |
| Glucose, fasting | 4–6 mmol/L (70–110 mg/dL) | Acute stress, cerebral lesions, Cushing's syndrome, diabetes mellitus, hyperthyroidism, pancreatic insufficiency | Addison's disease, hepatic disease, hypothyroidism, insulin overdosage, pancreatic tumour, pituitary hypofunction, post dumping syndrome | |
| 2-Hour oral glucose tolerance testing (OGTT) | | Diabetes mellitus | Hyperinsulinism | |
| Fasting | 4–6 mmol/L (70–110 mg/dL) | | | |
| 1 hour | <11.1 mmol/L (<200 mg/dL) | | | |
| 2 hours | <7.8 mmol/L (<140 mg/dL) | | | |
| Haptoglobin | 0.5–2.2 g/L (50–220 mg/dL) | Acute myocardial infarction, infectious and inflammatory processes, malignant neoplasms | Chronic liver disease, hemolytic anemia, mononucleosis, systemic lupus erythematosus, toxoplasmosis, transfusion reactions | |
| Homocysteine | 4–14 mcmol/L (0.54–1.9 mg/L) | Cardiovascular disease, cerebrovascular disease, peripheral vascular disease, cystinurea, vitamin B ₆ or B ₁₂ deficiency, folate deficiency, malnutrition | | |
| Insulin | 43–186 pmol/L (6–26 mcU/mL) | Acromegaly, adenoma of islet cells, obesity, untreated mild case of type 2 diabetes | Diabetes mellitus, obesity | |
| Iron | | Excessive red blood cell destruction, hemochromatosis, massive transfusion | Anemia of chronic disease, iron-deficiency anemia | |
| Male | 14–32 mcmol/L (80–180 mcg/dL) | | | |
| Female | 11–29 mcmol/L (60–160 mcg/dL) | | | |

TABLE B-1
Serum, Plasma, and Whole Blood Chemistries—cont'd

| Test | Normal Values | | Possible Etiology | |
|------------------------------------|---|---|--|--|
| | SI Units (Conventional Units) | Higher | Lower | |
| Total iron-binding capacity (TIBC) | 45–82 $\mu\text{mol/L}$ (250–460 mcg/dL) | Iron-deficient state, oral contraceptive use, polycythemia | Cancer, chronic infections, pernicious anemia, uremia | |
| Lactic acid | 0.6–2.2 mmol/L (5–20 mg/dL) | Acidosis, heart failure, severe liver disease, shock, tissue ischemia | | |
| Lactic dehydrogenase (LDH) | 100–190 U/L (same as SI units) | Heart failure, hemolytic disorders, hepatitis, metastatic cancer of liver, myocardial infarction, pernicious anemia, pulmonary embolus and infarction, skeletal muscle damage | | |
| Lactic dehydrogenase isoenzymes | | | | |
| LDH ₁ | 0.17–0.27 (17%–27%) | Myocardial infarction, pernicious anemia, strenuous exercise | | |
| LDH ₂ | 0.27–0.37 (27%–37%) | Exercise, pulmonary embolus, sickle cell crisis | | |
| LDH ₃ | 0.18–0.25 (18%–25%) | Malignant lymphoma, pulmonary embolus | | |
| LDH ₄ | 0.03–0.08 (3%–8%) | Systemic lupus erythematosus, pancreatitis, pulmonary infarction, renal disease | | |
| LDH ₅ | 0.0–0.05 (0%–5%) | Heart failure, hepatitis, pulmonary embolus and infarction, skeletal muscle damage, strenuous exercise | | |
| Lipase | 0–160 U/L (same as SI units) | Acute and chronic pancreatitis, hepatic disorders, pancreatic disorder (cancer, pseudocyst), perforated peptic ulcer, salivary gland inflammation or tumour | | |
| Magnesium | 0.65–1.05 mmol/L (1.3–2.1 mEq/L) | Addison's disease, hypothyroidism, renal failure | Chronic alcoholism, hyperparathyroidism, hyperthyroidism, hypoparathyroidism, malnutrition, severe malabsorption | |
| Myoglobin | <90 mcg/L (same as SI units) | Myocardial infarction, myositis, malignant hyperthermia, muscular dystrophy, skeletal muscle ischemia or trauma, rhabdomyolysis, seizures | | |
| Osmolality | 285–295 mmol/kg (285–295 mOsm/kg) H_2O | Chronic renal disease, dehydration, diabetes mellitus, hypernatremia, shock | Addison's disease, diuretic therapy, hyponatremia, overhydration | |
| Oxygen saturation | | Increased inspired oxygen, polycythemia vera | | |
| Arterial | $\geq 95\%$ (same as SI units) | | Anemia, cardiac decompensation, decreased inspired oxygen, respiratory disorders | |
| Venous | 60–80% (same as SI units) | | | |
| pH | See Blood gases | | | |
| Phenylalanine | 0–121 $\mu\text{mol/L}$ (0–2 mg/dL) | Phenylketonuria | | |
| Phosphatase, acid | 2.2–10.5 U/L (0.13–0.63 U/L – Roy, Brower, Hayden 37°C) | Advanced Paget's disease, cancer of prostate, hyperparathyroidism | | |
| Phosphatase, alkaline (ALP) | 0.5–2.0 mcat/L (30–120 U/L) | Bone diseases, cirrhosis, malignancy of liver/bone, marked hyperparathyroidism, obstruction of biliary system, rickets | Excessive vitamin D ingestion, hypothyroidism, milk-alkali syndrome | |
| Phosphorus, inorganic | 0.97–1.45 mmol/L (3.0–4.5 mg/dL) | Bone metastasis, healing fractures, hypoparathyroidism, hypocalcemia, renal disease, vitamin D intoxication | | |

Continued

TABLE B-1

Serum, Plasma, and Whole Blood Chemistries-cont'd

| Test | Normal Values | | Possible Etiology | |
|---|--------------------------------------|---|--|--|
| | SI Units (Conventional Units) | Higher | Lower | |
| Potassium | 3.5–5.0 mmol/L (3.5–5.0 mEq/L) | Acute or chronic renal failure, Addison's disease, dehydration, diabetic ketosis, excessive dietary/IV intake, massive tissue destruction, metabolic acidosis | Burns, Cushing's syndrome, deficient dietary or intravenous intake, diarrhea (severe), diuretic therapy, gastrointestinal fistula, insulin administration, pyloric obstruction, starvation, vomiting | |
| Prostate-specific antigen (PSA) | <4 mcg/L (<4 ng/mL) | Benign prostatic hypertrophy, prostate cancer, prostatitis | | |
| Proteins | | Burns, cirrhosis (globulin fraction), dehydration | Congenital agammaglobulinemia, increased capillary permeability, inflammatory disease, liver disease, malabsorption, malnutrition | |
| Total | 64–83 g/L (6.4–8.3 g/dL) | | | |
| Albumin | 35–50 g/L (3.5–5 g/dL) | | | |
| Globulin | 23–34 g/L (2.3–3.4 g/dL) | | | |
| Albumin/globulin ratio | 1.5:1–2.5:1 (same as SI units) | Multiple myeloma (globulin fraction), shock, vomiting | Malnutrition, nephrotic syndrome, proteinuria, renal disease, severe burns | |
| Renin | | Renal hypertension, salt-losing gastrointestinal disease (vomiting/diarrhea), volume decrease (e.g., hemorrhage) | Increased salt intake, primary aldosteronism | |
| Upright position | 0.03–1.2 ng/L/sec (0.1–4.3 mg/mL/hr) | | | |
| Sodium | 135–145 mmol/L (135–145 mEq/L) | Corticosteroid therapy, dehydration, impaired renal function, increased sodium intake in diet/IV, primary aldosteronism | Addison's disease, decreased sodium intake in dietary or intravenous intake, diabetic ketoacidosis, diuretic therapy, excessive loss from gastrointestinal tract, excessive perspiration, water intoxication | |
| Testosterone | | | | |
| Male | 9.75–38 nmol/L (280–1080 ng/dL) | Adrenal hyperplasia, adrenal or pituitary tumours, testicular tumours | Hypofunction of testes | |
| Female | 0.52–2.43 nmol/L (<70 ng/dL) | Polycystic ovary, virilizing tumours | | |
| T ₄ (thyroxine), total | 64–154 nmol/L (5–12 mcg/dL) | Hyperthyroidism, thyroiditis | Cretinism, hypothyroidism, myxedema | |
| T ₄ (thyroxine), free | 10–36 pmol/L (0.8–2.8 ng/dL) | Hyperthyroidism, metastatic neoplasms | Hypothyroidism, pregnancy | |
| T ₃ uptake | 24–34 AU (24%–34%) | | | |
| T ₃ (triiodothyronine) | 1.2–3.4 nmol/L (70–205 ng/dL) | Hyperthyroidism | Hypothyroidism | |
| Thyroid-stimulating hormone (TSH) | 2–10 mU/L (2–10 mcU/L) | Graves' disease, myxedema, primary hypothyroidism | Secondary hypothyroidism | |
| Transaminases | | | | |
| Serum glutamic oxaloacetic transferase (SGOT) or aspartate aminotransferase (AST) | 0–0.58 mkat/L (0–35 U/L) | Acute hepatitis, liver disease, myocardial infarction, pulmonary infarction | | |
| Serum glutamate pyruvate transferase (SGPT) or alanine aminotransferase (ALT) | 4–36 U/L (Same as SI units) | Liver disease, shock | | |
| Triglycerides | | Diabetes mellitus, hyperlipidemia, hypothyroidism, liver disease | Hyperthyroidism, malabsorption syndrome, malnutrition | |
| Male | 0.45–1.81 mmol/L (40–160 mg/dL) | | | |
| Female | 0.40–1.52 mmol/L (35–135 mg/dL) | | | |
| Troponin T (cTnT): | <0.2 mcg/L (<0.2 ng/mL) | Cardiac muscle damage, (myocardial infarction, myocarditis or pericarditis), chronic renal failure, multiorgan failure, severe heart failure | | |
| Troponin I (cTnI) | <0.03 mcg/L (<0.3 ng/mL) | | | |

TABLE B-1
Serum, Plasma, and Whole Blood Chemistries—cont'd

| Test | Normal Values | | Possible Etiology | |
|-------------------------|-----------------------------------|--|---|--|
| | SI Units (Conventional Units) | Higher | Lower | |
| Urea nitrogen (BUN) | 3.6–7.1 mmol/L (10–20 mg/dL) | Burns, dehydration, gastrointestinal bleeds, increase in protein catabolism (fever, stress), renal disease, shock, urinary tract infection | Fluid overload, malnutrition, severe liver damage, SIADH | |
| Uric acid | | Alcoholism, eclampsia, gout, gross tissue destruction, high-protein weight reduction diet, leukemia, multiple myeloma, renal failure | Administration of uricosuric drugs | |
| Male | 0.24–0.51 mmol/L (4.0–8.5 mg/dL) | | | |
| Female | 0.16–0.43 mmol/L (2.7–7.3 mg/dL) | | | |
| Vitamin A | 0.52–2.09 mcmol/L (15–60 mcg/dL) | Excess ingestion of vitamin A | Vitamin A deficiency | |
| Vitamin B ₁₂ | 118–701 pmol/L (160–950 pg/mL) | Chronic myeloid leukemia | Malabsorption syndrome, pernicious anemia, strict vegetarianism, total or partial gastrectomy | |
| Zinc | 11.5–18.5 mcmol/L (75–120 mcg/dL) | | Alcoholic cirrhosis | |

TABLE B-2
Hematology

| Test | Normal Values | | Possible Etiology | |
|---|--|--|---|--|
| | SI Units (Conventional Units) | Higher | Lower | |
| Bleeding time (IVY) | 1–9 min | Aspirin ingestion, clotting factor deficiency, defective platelet function, thrombocytopenia, vascular disease, von Willebrand's disease | | |
| Activated partial thromboplastin time (APTT) | 30–40 sec* (same as SI units) | Deficiency of factors I, II, V, VIII, IX and X, XI, XII; hemophilia; heparin therapy; liver disease | | |
| Partial thromboplastin time (PTT) | 60–70 sec (same as SI units) | Same etiology as for APTT | | |
| Automated coagulation time or activated clotting time (ACT) | 70–120 sec (same as SI units) | Same etiology as for APTT | | |
| Prothrombin time (Protime, PT) | 11–12.5 sec* (same as SI units) | Deficiency of factors I, II, V, VII, and X; liver disease; vitamin K deficiency; warfarin therapy | | |
| International normalized ratio (INR) | 0.81–1.2 (same as SI units) | Same etiology as for PT | | |
| Thrombin Time | 8–12 sec (same as SI units) | Disseminated intravascular coagulation (DIC), increased tendency to bleed | | |
| Fibrinogen | 2–4 g/L (200–400 mg/dL) | Burns (after first 36 hr), inflammatory disease | Burns (during first 36 hr), DIC, severe liver disease | |
| Fibrin split (degradation) products | <10 mg/L (<10 mcg/mL) | Acute DIC, massive hemorrhage, massive trauma, primary fibrinolysis | | |
| D-Dimer | <250 mcg/L (<250 ng/mL) | Deep vein thrombosis, DIC, myocardial infarction, unstable angina | | |
| Erythrocyte count [†] (altitude dependent) | | Dehydration, high altitudes, polycythemia vera, severe diarrhea | Anemia, leukemia, post hemorrhage | |
| Male | 4.7–6.1 × 10 ¹² /L (4.7–6.1 × 10 ⁶ /mCL) | | | |
| Female | 4.2–5.4 × 10 ¹² /L (4.2–5.4 × 10 ⁶ /mCL) | | | |

*Patients receiving anticoagulant therapy:

APTT: 1.5–2.5 times control value in seconds

PT: 1.5–2.0 times control value in seconds

[†]Components of complete blood count (CBC).

Continued

TABLE B-2
Hematology-cont'd

| Test | Normal Values | | Possible Etiology | |
|---|--|--|---|--|
| | SI Units (Conventional Units) | Higher | Lower | |
| Mean corpuscular volume (MCV) | 80–95 mm ³ (same as SI units) | Folic acid and vitamin B ₁₂ deficiency, liver disease, macrocytic anemia | Microcytic anemia | |
| Mean corpuscular hemoglobin (MCH) | 27–31 pg (same as SI units) | Macrocytic anemia | Microcytic anemia | |
| Mean corpuscular hemoglobin concentration (MCHC) | 320–360 g/L (32–36 g/dL) (32%–36%) | Intravascular hemolysis, spherocytosis | Hypochromic anemia | |
| Erythrocyte sedimentation rate (ESR), Westergren | | <i>Moderate increase:</i> acute hepatitis, myocardial infarction, rheumatoid arthritis | Malaria, severe liver disease, sickle cell anemia | |
| Male | <50 yr <15 mm/hr (same as SI units)
>50 yr <20 mm/hr (same as SI units) | <i>Marked increase:</i> acute and severe bacterial infections, malignancies, pelvic inflammatory disease | | |
| Female | <50 yr <20 mm/hr (same as SI units)
>50 yr <30 mm/hr (same as SI units) | | | |
| Hematocrit (altitude dependent) [†] | | Dehydration, high altitudes, polycythemia | Anemia, bone marrow failure, hemorrhage, leukemia, overhydration | |
| Male | 0.42–0.52 volume fraction (42%–52%) | | | |
| Female | 0.37–0.47 volume fraction (37%–47%) | | | |
| Hemoglobin (altitude dependent) [†] | | Chronic obstructive pulmonary disease, high altitudes, polycythemia | Anemia, hemorrhage | |
| Male | 135–180 g/L (13.5–18 g/dL) | | | |
| Female | 120–160 g/L (12–16 g/dL) | | | |
| Hemoglobin, glycosylated or glycated (HbA _{1c} [A _{1c}]) | Less than 6% (adult without diabetes) | Nondiabetic hyperglycemia, poorly controlled diabetes mellitus | Chronic blood loss, chronic renal failure, pregnancy, sickle cell anemia | |
| Red cell distribution width (RDW) | 11%–14.5% (same as SI units) | | Anisocytosis, macrocytic anemia, microcytic anemia | |
| Platelet count (thrombocytes) | 150–400 × 10 ⁹ /L (150,000–400,000 mm ³) | Acute infections, chronic granulocytic leukemia, chronic pancreatitis, cirrhosis, collagen disorders, polycythemia, post splenectomy | Acute leukemia, cancer chemotherapy, DIC, hemorrhage, infection, systemic lupus erythematosus, thrombocytopenic purpura | |
| Reticulocyte count(manual) | 0.5%–2% of RBC (same as SI units) | Hemolytic anemia, polycythemia vera | Hypoproliferative anemia, macrocytic anemia, microcytic anemia | |
| White blood cell (WBC) count [†] | 5–10 × 10 ⁹ /L (5000–10,000 mm ³) | Inflammatory and infectious processes, leukemia | Aplastic anemia, autoimmune diseases, overwhelming infection, side effects of chemotherapy and irradiation | |
| WBC differential | | | | |
| Segmented neutrophils | 2.5–7.5 × 10 ⁹ /L (62%–68%) | Bacterial infections, collagen diseases, Hodgkin's disease | Aplastic anemia, viral infections | |
| Band neutrophils | 0–1 × 10 ⁹ /L (0%–9%) | Acute infections | | |
| Lymphocytes | 0.1–0.4 × 10 ⁹ /L (1000–4000 mm ³) (20%–40%) | Chronic infections, lymphocytic leukemia, mononucleosis, viral infections | Corticosteroid therapy, whole body irradiation | |
| Monocytes | 0.02–0.07 × 10 ⁹ /L (100–700 mm ³) (2%–8%) | Acute infections, chronic inflammatory disorders, Hodgkin's disease, malaria, monocytic leukemia | | |
| Eosinophils | 0.01–0.04 × 10 ⁹ /L (50–100 mm ³) (1%–4%) | Allergic reactions, eosinophilic and chronic granulocytic leukemia, Hodgkin's disease, parasitic disorders | Corticosteroid therapy | |
| Basophils | 0.0–0.01 × 10 ⁹ /L (25–100 mm ³) (0.5%–1%) | Hypothyroidism, myeloproliferative diseases, ulcerative colitis | Hyperthyroidism, stress | |
| Sickle cell solubilitytest | Negative (Negative) | Sickle cell anemia | | |

TABLE B-3
Serology-Immunology

| Test | Normal Values | | Possible Etiology | |
|---|--|---|--|--|
| | SI Units (Conventional Units) | Higher | Lower | |
| Antinuclear antibody (ANA) | Negative at 1:40 dilution (same as SI units) | Chronic hepatitis, rheumatoid arthritis, scleroderma, systemic lupus erythematosus (SLE) | | |
| Anti-DNA antibody | Negative <70 U/mL (same as SI units) | SLE | | |
| Anti-RNP (ribonucleoprotein) | Negative (Negative) | Mixed connective tissue disease, scleroderma, rheumatoid arthritis, Sjögren's syndrome, SLE | | |
| Anti-Smith (Smith) | Negative (Negative) | SLE | | |
| Antistreptolysin-O (ASO) | ≤160 Todd units/mL (same as SI units) | Acute glomerulonephritis, rheumatic fever, streptococcal infection | | |
| C-reactive protein (CRP) | <10 mg/L (<1.0 mg/dL) | Acute infections, any inflammatory condition (e.g., acute rheumatic fever/arthritis), widespread malignancy | | |
| Carcinoembryonic antigen (CEA) | 5 mcg/L (5 ng/mL) | Carcinomas of colon, liver, pancreas; chronic cigarette smoking; inflammatory bowel disease; other cancers | | |
| Complement assay components | | | Acute glomerulonephritis, rheumatoid arthritis, serum sickness, subacute bacterial endocarditis, SLE | |
| Total C3 | 75–160 k/units/L (75–160 U/mL) | | | |
| C4 | 0.55–1.2 g/L (55–120 mg/dL) | | | |
| Direct antihuman globulin test (DAT) or direct Coombs' test | Negative (Negative) (No agglutination) | Acquired hemolytic anemia, drug reactions, hemolytic disease of the newborn, transfusion reactions | | |
| Fluorescent treponemal antibody absorption (FTAAbs) | Negative (Nonreactive) | Syphilis | | |
| Hepatitis A antibody | Negative (Negative) | Hepatitis A | | |
| Hepatitis B surface antigen (HBsAg) | Negative (Negative) | Hepatitis B | | |
| Hepatitis C antibody | Negative (Negative) | Hepatitis C | | |
| Immunoglobulins | | | | |
| IgA | 0.85–3.85 g/L (85–385 mg/dL) | Autoimmune disorders, chronic infection, chronic liver disease, IgA myeloma, rheumatoid arthritis | Burns, hereditary telangiectasia, malabsorption syndromes | |
| IgD | Minimal | Chronic infection, connective tissue disease | | |
| IgE | Minimal | Anaphylactic shock, atopic disease (allergies), parasite infections | | |
| IgG | 5.65–17.65 g/L (565–1765 mg/dL) | Hepatitis, IgG monoclonal gammopathy, infections—acute and chronic, SLE | Acquired deficiencies, burns, congenital deficiencies, immunosuppression, nephrotic syndromes | |
| IgM | 0.55–3.75 g/L (55–375 mg/dL) | Acute infections, liver disease, rheumatoid arthritis | Congenital and acquired antibody deficiencies, lymphocytic leukemia, protein-losing enteropathies | |
| Monospot or monotest | Negative (<1:28 titre) | Infectious mononucleosis | | |
| Rheumatoid factor (RA factor) | 0.2 kU/L (0.2 U/mL) nephelometric method | Rheumatoid arthritis, Sjögren's syndrome, SLE | | |
| RPR (rapid plasma reagin) test | <1:20 titre agglutination method | | | |
| | Negative or nonreactive (same as SI units) | Febrile diseases, IV drug abuse, leprosy, malaria, rheumatoid arthritis, syphilis, SLE | | |

Continued

TABLE B-3

Serology-Immunology-cont'd

| Test | Normal Values | | Possible Etiology | |
|--|--|---|-------------------|--|
| | SI Units (Conventional Units) | Higher | Lower | |
| VDRL (Venereal Disease Research Laboratory) test | Negative or nonreactive (same as SI units) | Syphilis | | |
| Thyroid antibodies | Titre <1:100 (same as SI units) | Early hypothyroidism, Graves' disease, Hashimoto's thyroiditis, pernicious anemia, SLE, thyroid carcinoma | | |

TABLE B-4

Urine Chemistry

| Test | specimen | Normal Values | | Possible Etiology | |
|---|----------|---|--|---|--|
| | | SI Units (Conventional Units) | Higher | Lower | |
| Acetone (ketones) | Random | Negative (Negative) | Diabetes mellitus, high-fat and low-carbohydrate diets, starvation states | | |
| Aldosterone | 24 hr | 6–72 nmol/24 hr (2–26 mcg/24 hr) (depends on urinary sodium) | Primary aldosteronism: adrenocortical tumours
Secondary aldosteronism: cardiac failure, cirrhosis, large dose of ACTH, salt depletion | Adrenocorticotrophic hormone (ACTH) deficiency, Addison's disease, corticosteroid therapy | |
| Amylase | 24 hr | Up to 5000 Somogyi units/24 hr OR 6.5–48.1 units/hr | Acute pancreatitis | | |
| Bence Jones protein | Random | Negative (Negative) | Biliary duct obstruction, multiple myeloma | | |
| Bilirubin | Random | Negative (Negative) | Hepatitis | | |
| Calcium | 24 hr | 6.2 mmol/day (<250 mg/day) | Bone tumour, hyperparathyroidism, milk-alkali syndrome | Hypoparathyroidism, malabsorption of calcium and vitamin D | |
| Catecholamines | 24 hr | | Heart failure, pheochromocytoma, progressive muscular dystrophy | | |
| Epinephrine
Norepinephrine
Chloride | 24 hr | <109 nmol/day (<20 mcg/d)
<590 nmol/day (<100 mcg/d)
110–250 mmol/d (110–250 mEq/d)
<0.5 mmol/d (<30 mcg/d) | Addison's disease | Burns, diarrhea, excess perspiration, menstruation, vomiting | |
| Copper | 24 hr | 0.6 mmol/d (<40 mcg/d) | Cirrhosis, Wilson's disease | | |
| Coproporphyrin | 24 hr | <300 nmol/d (<200 mcg/d) | Lead poisoning, oral contraceptive use, poliomyelitis | | |
| Creatine | 24 hr | | Addison's disease, burns, carcinoma of liver, diabetes, hyperthyroidism, infections, muscular dystrophy, skeletal muscle atrophy | Hypothyroidism | |
| Male
Female
Creatinine | 24 hr | <300 mmol/d (<60 mg/d)
<600 mmol/d (<80 mg/d)
7.1–17.7 mmol/d (0.8–2 g/d) | Anemia, leukemia, muscular atrophy, salmonellosis | Renal disease | |
| Creatinine clearance | 24 hr | 1.42–2.25 mL/sec (85–135 mL/min)
Male
1.78–2.32 mL/sec (107–139 mL/min)
Female
1.45–1.78 mL/sec (87–107 mL/min) | | Renal disease | |

TABLE B-4
Urine Chemistry—cont'd

| Test | specimen | Normal Values | | Possible Etiology | |
|--------------------------------------|----------------|--|--|---|--|
| | | SI Units (Conventional Units) | Higher | Lower | |
| Estriol | 24 hr | | Gonadal or adrenal tumour | Agensis of ovaries, endocrine disturbance, menopause, ovarian dysfunction | |
| Female | | | | | |
| • Ovulation peak | | 104–370 nmol/d (28–100 mcg/d) | | | |
| • Luteal peak | | 81–296 nmol/d (22–80 mcg/d) | | | |
| • Pregnancy | | Up to 166,455 nmol/d (Up to 45,000 mcg/d) | | | |
| • Menopause | | 5.2–72.5 nmol/d (1.4–19.6 mcg/d) | | | |
| Male | | 18–67 nmol/d (5–18 mcg/d) | | | |
| Glucose | Random | Negative (Negative) | Diabetes mellitus, low renal threshold for glucose resorption, physiological stress, pituitary disorders | | |
| Hemoglobin | Random | Negative (Negative) | Extensive burns, glomerulonephritis, hemolytic anemias, hemolytic transfusion reaction | | |
| 5-Hydroxyindole-acetic acid (5-HIAA) | 24 hr | 10–40 mmol/d (2–8 mg/24 hr) | Malignant carcinoid syndrome | | |
| Ketone bodies | Random | Negative (Negative) | Alcoholism, fasting, high-protein diets, marked ketonuria, poorly controlled diabetes mellitus, starvation | | |
| Lead | 24 hr | <0.40 mmol/d (<80 mcg/d) | Lead poisoning | | |
| Metanephrine | 24 hr | <7 mmol/d (<1.3 mg/d) | Pheochromocytoma | | |
| Myoglobin | Random | Negative (Negative) | Crushing injuries, electric injuries, extreme physical exertion | | |
| pH | Random | 4.6–8 (same as SI units)
Average: 6 | Chronic renal failure, compensatory phase of alkalosis, salicylate intoxication, vegetarian diet | Compensatory phase of acidosis, dehydration, emphysema | |
| Phenylpyruvic acid | Random | Negative (Negative) | Phenylketonuria | | |
| Phosphorus, inorganic | 24 hr | 29–42 mmol/d (0.9–1.3 g/d) | Fever, hypoparathyroidism, nervous exhaustion, rickets, tuberculosis | Acute infections, nephritis | |
| Porphobilinogen | Random | Negative (Negative) | Acute intermittent porphyria, liver disorders | | |
| Potassium | 24 hr
24 hr | <8.8 mmol/d (<2 mcg/d)
25–100 mmol/d (25–100 mEq/d) | Chronic renal failure, starvation, Cushing's syndrome, hyperaldosteronism, alkalosis, diuretic therapy | Reduced intake, dehydration, Addison's disease, malnutrition, vomiting, diarrhea, acute renal failure | |
| Protein (dipstick) | Random | Negative (Negative) | Heart failure, nephritis, nephrosis, physiological stress | | |
| Protein (quantitative) | 24 hr | <0.15 g/d (<150 mg/d) | Cardiac failure, inflammatory processes of urinary tract, nephritis, nephrosis, toxemia of pregnancy | | |
| At rest | | 0.05–0.08 g/d (<50–80 mg/d) | | | |
| During exercise | | <0.25 g/d (<250 mg/d) | | | |
| Sodium | 24 hr | 40–250 mmol/d (40–250 mEq/d) | Acute tubular necrosis | Hyponatremia | |
| Specific gravity | Random | 1.005–1.030 (same as SI units) | Albuminuria, dehydration, fever, gastrointestinal losses (vomiting/diarrhea), glycosuria, syndrome of inappropriate antidiuretic hormone (SIADH) | Diabetes insipidus, diuresis, overhydration | |

Continued

TABLE B-4
Urine Chemistry—cont'd

| Test | specimen | Normal Values | Possible Etiology | |
|-----------------------|-----------------|---|---|-----------------------------------|
| | | SI Units (Conventional Units) | Higher | Lower |
| Titrateable acidity | 24 hr | 20–50 mEq/d (same as SI units) | Metabolic acidosis | Metabolic alkalosis |
| Uric acid | 24 hr | 1.48–4.43 mmol/d (250–750 mg/24 hr) | Gout, leukemia | Nephritis |
| Urobilinogen | 24 hr
Random | 0.0–6.8 mcmol/d (0.0–4.0 mg/24 hr)
<0.01–1 EU (same as SI units) | Hemolytic disease, hepatic parenchymal cell damage, liver disease | Complete obstruction of bile duct |
| Uroporphyrins | 24 hr | | Lead poisoning, liver disease, porphyria | |
| Male | | 4–46 mcg/d (same as SI units) | | |
| Female | | 3–22 mcg/d (same as SI units) | | |
| Vanillylmandelic acid | 24 hr | <35 mcmol/d (<6.8 mg/d) | Pheochromocytoma, neuroblastomas | |

TABLE B-5
Gastric Analysis

| Test | Normal Values | Possible Etiology | |
|------------------------|-------------------------------|---|-------------------------------------|
| | SI Units (Conventional Units) | Higher | Lower |
| Basal | | | |
| Free hydrochloric acid | 0.3 mmol/L (0.3 mEq/L) | Hypermotility of stomach | Pernicious anemia |
| Total acidity | 15–45 mmol/L (15–45 mEq/L) | Gastric and duodenal ulcers, Zollinger-Ellison syndrome | Gastric carcinoma, severe gastritis |
| Poststimulation | | | |
| Free hydrochloric acid | 10–130 mmol/L (10–130 mEq/L) | | |
| Total acidity | 20–150 mmol/L (20–150 mEq/L) | | |

TABLE B-6
Fecal Analysis

| Test | Normal Values | Possible Etiology | |
|--------------|--|--|------------------------------|
| | SI Units (Conventional Units) | Higher | Lower |
| Fecal fat | 7.21 mmol/day (2–6 g/d) | Chronic pancreatic disease, cystic fibrosis, malabsorption syndrome, obstruction of common bile duct, short gut syndrome | |
| Urobilinogen | 51–372 mcmol/100 g of stool (30–220 mg/100 g of stool) | Hemolytic anemias | Complete biliary obstruction |
| Mucus | Negative (Negative) | Mucous colitis, spastic constipation | |
| Pus | Negative (Negative) | Chronic bacillary dysentery, chronic ulcerative colitis, localized abscesses | |
| Blood* | Negative (Negative) | Anal fissures, hemorrhoids, inflammatory bowel disease, malignant tumour, peptic ulcer | |
| Colour | | | |
| Brown | | Various colours depending on diet | |
| Clay | | Biliary obstruction or presence of barium sulphate | |
| Tarry | | More than 100 mL of blood in gastrointestinal tract | |
| Red | | Blood in large intestine | |
| Black | | Blood in upper gastrointestinal tract or iron medication | |

*Ingestion of meat may produce false-positive results. Patient may be placed on a meat-free diet for three days before the test.

TABLE B-7
Cerebrospinal Fluid Analysis

| Test | Normal Values | | Possible Etiology | |
|----------------------------|--|--|--|--|
| | SI Units (Conventional Units) | Higher | Lower | |
| Pressure | <20 cm H ₂ O (same as SI units) | Hemorrhage, intracranial tumour, meningitis | Head injury, spinal tumour, subdural hematoma | |
| Blood | Negative (Negative) | Intracranial hemorrhage | | |
| Cell count (age dependent) | | | | |
| WBC (white blood cells) | 0–5 × 10 ⁶ /L (0–5 cells/mcL) | Inflammation or infections of central nervous system (CNS) | | |
| RBC (red blood cells) | Negative (Negative) | | | |
| Chloride | 115–130 mmol/L (115–130 mEq/L) | Uremia | Bacterial infections of CNS (meningitis, encephalitis) | |
| Glucose | 2.8–4.2 mmol/L (50–75 mg/dL) | Diabetes mellitus, viral infections of CNS | Bacterial infections and tuberculosis of CNS | |
| Protein | | | | |
| Lumbar | 0.15–0.45 g/L (15–45 mg/dL) | Guillain-Barré syndrome, poliomyelitis, traumatic tap | | |
| Cisternal | 0.15–0.25 g/L (15–25 mg/dL) | Syphilis of CNS | | |
| Ventricular | 0.05–0.15 g/L (5–15 mg/dL) | Acute meningitis, brain tumour, chronic CNS infections, multiple sclerosis | | |

Chapter 1

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Chapter 38

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Chapter 41

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Chapter 42

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Chapter 43

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Chapter 47

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Appendix A

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Review Question Rationales

Chapter 1

1. **The correct answer is 1.** The *Lalonde Report* shifted emphasis from a medical to a behavioural approach to health. It concluded that the traditional medical approach to health care was inadequate and that “further improvements in the environment, reductions in self-imposed risks, and a greater knowledge of human biology” are necessary to improve the health status of Canadians.
2. **The correct answer is 4.** The *Ottawa Charter for Health Promotion* supported a socioenvironmental approach to health. It identified prerequisites for health: peace, shelter, education, food, income, a stable ecosystem, sustainable resources, social justice, and equity.
3. **The correct answer is 1.** Labonte (1993) categorized the major determinants of health in a socioenvironmental approach as psychosocial risk factors and socioenvironmental risk conditions. Political, social, and cultural forces affect health and well-being directly and indirectly through their influence on personal health behaviours. Socioenvironmental risk conditions can contribute to psychosocial risk factors, which can then result in unhealthy behaviours.
4. **The correct answer is 1.** Given that the determinants of health are broad, healthy public policy must extend beyond traditional health care agencies and government health care departments to other sectors such as agriculture, education, transportation, labour, social services, energy, and housing. Therefore, policymakers in all government sectors and organizations should know the health consequences of their policies.
5. **The correct answer is 2.** Primary prevention includes activities that protect against a disease before signs and symptoms occur. Examples are immunization (to prevent infectious diseases) and reduction of risk factors (such as inactivity, smoking, and exposure to air pollution).
6. **The correct answer is 3.** Rather than focusing only on helping people develop healthy behaviours, health promotion seeks to create healthy public policy, supportive environments, community action, and personal skill. Health promotion is committed to empowerment and community-based health planning and addresses health issues within the context of the social, economic, and political environment. It therefore is political.
7. **The correct answer is 2.** The belief that health is primarily an *individual* responsibility is most congruent with the behavioural approach to health. The behavioural approach places responsibility for health on the individual, thereby favouring health promotion strategies such as education. Strategies are often based on the assumption that if people know the risk factors of disease, they will engage in healthy behaviours.
8. **The correct answer is 3.** Rather than focusing primarily on interventions at the societal level, the population health promotion model advocates that interventions be implemented toward individuals and families, communities, individual sectors of society (such as health care or environmental sectors), and society as a whole.
9. **The correct answer is 2.** Income and social status are the greatest determinants of health. Canadians who live in poverty have poorer health and are more likely to die earlier

and to suffer more illnesses than those with higher incomes, regardless of age, sex, race, culture, and place of residence.

10. **The correct answer is 2.** Health promotion is directed toward increasing the level of well-being and self-actualization.

Chapter 2

1. **The correct answer is 2.** Canada Infoway was created by the First Ministers in 1999 to move the e-health agenda across Canada.
2. **The correct answer is 4.** A number of target groups (e.g., Royal Canadian Mounted Police [RCMP], Aboriginal peoples, members of military services) are covered directly by the Canadian government. People who are moving between provinces or territories are covered under the *Canada Health Act*.
3. **The correct answer is 2.** Public health care is focused on preventive measures and programs that ensure conditions and circumstances to keep people healthy through appropriate screening, assessment, development, monitoring, and support (i.e., public policy).
4. **The correct answer is 1.** The five principles of the *Canada Health Act* are public administration, comprehensiveness, universality, portability, and accessibility.
5. **The correct answer is 3.** Community services are directed at primary and secondary care, located where they live, work, play, and interact. An adult day care centre is a community agency.
6. **The correct answer is 1.** The five levels of health care services are promotive, preventive, curative (diagnosis and treatment), rehabilitative, and supportive (including home care, long-term care, and palliative care).
7. **The correct answer is 3.** Many professional associations have committed to ethical recruitment and retention at the international level to reduce depletion of critically needed health care providers in developing contexts.
8. **The correct answer is 1.** Health care cost accelerators include new technology, new pharmaceuticals, an increase in chronic and new diseases, and changing demographics and expectations.
9. **The correct answer is 2.** Disease prevention services help patients, families, and communities reduce risk factors for disease and injury. Prevention strategies include clinical (screening, immunization), behavioural (lifestyle change, support groups), or environmental (societal pressure for a healthy environment).
10. **The correct answer is 3.** Secondary care involves provision of a specialized medical service by a physician specialist or a hospital on referral from a primary care practitioner. Secondary care deals with patients seeking definitive diagnosis or requiring further diagnostic review.

Chapter 3

1. **The correct answer is 2.** Florence Nightingale, considered to be the founder of modern nursing, spearheaded the movement to improve standards of nursing care in the mid-nineteenth century.
2. **The correct answer is 3.** Marguerite d'Youville formed the Sisters of Charity of Montreal, a Canadian order of nuns, in 1737. They began as a small group of women who pooled their

possessions to form a refuge for the poor and needy and eventually became the first visiting nurses in Canada.

3. **The correct answer is 4.** The first doctoral nursing program was established at the University of Alberta on January 1, 1991.
4. **The correct answer is 3.** As a result of a movement that began in the 1960s, nursing legislation has recently been developed in most provinces and territories to regulate the practice of nurse practitioners.
5. **The correct answer is 1.** A code of ethics defines the principles by which nurses function. The first code of ethics for nursing was developed by the International Council of Nurses (ICN) in 1953 and was adopted by the Canadian Nurses Association (CNA) in 1954. The CNA Code of Ethics was updated most recently in 2008.
6. **The correct answer is 2.** Professional nursing organizations establish education and practice standards for nurses, carry out the regulatory functions of registration and licensure, and discipline members who do not meet the standards. They also serve as the voice of nurses on matters of professional interest and concern, help their members maintain competence through continuing education, and collaborate with other health care professional organizations on matters of mutual interest. They do not monitor unregulated care providers.
7. **The correct answer is 2.** In all provinces and territories, nursing practice acts regulate licensure and the practice of nursing. Each province or territory defines for itself the scope of nursing practice because constitutional responsibility for education and health care rests with individual provinces and territories.
8. **The correct answer is 2.** In all provinces except Ontario and Quebec, provincial nursing associations assume responsibility for defining and monitoring standards.
9. **The correct answer is 3.** Nursing unions are primary participants as the representatives of nurses in particular provinces or territories when new contracts are negotiated.

Chapter 4

1. **The correct answer is 1.** The overall goals of a population health approach are to maintain and improve the health of the entire population and to eliminate health disparities. The population health approach provides a framework for thinking about health and for taking action to improve the health of populations. Action is directed primarily at community levels.
2. **The correct answer is 2.** Public health nursing merges knowledge from the public health sciences with professional nursing theories to safeguard and improve the health of populations in the community.
3. **The correct answer is 3.** Community-based nursing involves acute, chronic, and palliative care of patients and families that enhances their capacity for self-care and promotes autonomy in decision making.
4. **The correct answer is 4.** Vulnerable populations of patients are those who are likely to develop health problems as a result of excess risks, who experience barriers when trying to access to health care services, or who are dependent on others for care.
5. **The correct answer is 4.** Competent care of vulnerable populations does not include offering financial or legal advice.
6. **The correct answer is 2.** Physical, emotional, and sexual abuse, as well as neglect, are major public health problems affecting older adults, women, and children.
7. **The correct answer is 2.** A successful community health nursing practice requires an ability to build relationships with

the community and to be responsive to changes within the community.

8. **The correct answer is 3.** Perinatal classes, infant care, child safety, and cancer screening are just some of the health education programs in which a nurse in community practice may participate as a nurse educator.
9. **The correct answer is 1.** The nurse as consultant provides information and supports participation in health activities. In this role, the nurse responds to inquiries about and makes referrals to community resources.
10. **The correct answer is 1.** The community can be viewed as having three components: locale or structure, the social systems, and the people.

Chapter 5

1. **The correct answer is 4.** A theory is a purposeful set of assumptions or propositions that show relationships between concepts. Theories are useful because they provide a systematic view of explaining, predicting, and prescribing phenomena.
2. **The correct answer is 3.** The drive for early theorizing about nursing practice came from nursing educators, who noted that traditional ways of preparing professional nurses were becoming outdated.
3. **The correct answer is 1.** The nursing process originally involved four steps: assessment, planning, intervention, and evaluation.
4. **The correct answer is 1.** Each conceptual framework attempted to define nursing by creating a theoretical definition for the substance and structure of the key bodies of knowledge needed to understand clinical situations. This knowledge was called the metaparadigm concepts and included person, environment, health care, and nursing care.
5. **The correct answer is 3.** The question confronting early theorists about nursing practice remained as follows: How does a nurse organize and make sense of all available knowledge and apply it intelligently to the challenges that arise in an individual clinical case?
6. **The correct answer is 1.** Kuhn challenged the traditional notion of science as a logical progression of discoveries. He argued that major scientific developments occurred when scientists thought about problems in radically new and different ways.
7. **The correct answer is 1.** The main features of the McGill model were "a focus on health rather than illness and treatment, on all family members rather than the patient alone, on family goals rather than on the nurse's, and on family strengths rather than their deficits."
8. **The correct answer is 2.** Peplau defined the essence of nursing as the interpersonal relationship between the nurse and the patient. She viewed this relationship as interactive and therapeutic, in which the goal was to support the patient to achieve independent living.
9. **The correct answer is 2.** Canadian theorist Evelyn Adam articulated the essence of nursing as a helping process. From her perspective, the nurse played a complementary-supplementary role in supporting the patient's strength, knowledge, and will.
10. **The correct answer is 2.** Systems theory accounted for the whole of an entity (the system) and its component parts (subsystems), as well as the interactions between the parts and the whole.

11. **The correct answer is 2.** Parse's nursing model does not articulate goals for nursing in the traditional sense of defining health; instead, it relies on the notion of people in a continuous process of making choices and changing health care priorities.

Chapter 6

1. **The correct answer is 4.** The first provincially approved doctoral nursing program was established at the University of Alberta Faculty of Nursing in 1991.
2. **The correct answer is 4.** Carper (1978) described empirics as "knowledge that is systematically organized into general laws and theories for the purpose of describing, explaining and predicting phenomena of special concern to the discipline of nursing."
3. **The correct answer is 1.** The quantitative research approach is characterized by systematic, orderly procedures that seek to limit the possibility of error and minimize the likelihood that any bias or opinion by the researcher might influence the results of research and, thus, the knowledge gained.
4. **The correct answer is 3.** Ethnography is chosen if the research question leads to the study of behaviour within a specific group or culture. Ethnography involves the observation and description of behaviour in social settings. It is derived from anthropology, in which it provides the means to study the culture of groups of people.
5. **The correct answer is 2.** Subjectivity from the participants' perspective is sought in qualitative research. Because of the nature of the data, rich with personal experience and example, the research is usually reported in a literary style, similar to storytelling.
6. **The correct answer is 4.** Quasi-experimental designs are an adaptation of the experimental design. Measurement of outcome variables occurs before and after an intervention (treatment) is given to research subjects. As the design incorporates measurement in a structured way, it is a quantitative design.
7. **The correct answer is 2.** The sample in a survey design should be representative of the population so that generalizations can be made on the basis of the sample data.
8. **The correct answer is 3.** Naming other participants is not required for informed consent. The consent form must describe the purpose of the study, the role of the subjects, types of data that are to be obtained, how the data are obtained, the duration of the study, subject selection, procedures, risks to the subject, potential benefits, alternatives to participation, and contact information.
9. **The correct answer is 3.** A quasi-experimental research design is one in which groups are formed and the conditions are controlled, but the subjects are not randomly assigned to a control group or treatment conditions.
10. **The correct answer is 4.** As well as using knowledge based on systematic research studies, evidence-informed practice also takes into account a nurse's clinical experience, practice trends, and patient preferences.
2. **The correct answer is 4.** *Justice* refers to fairness. The term is often used during discussions about resources. The question in this situation is how to determine the just distribution of resources. What constitutes a fair distribution of resources may not always be clear.
3. **The correct answer is 3.** *Maleficence* refers to harm or hurt; thus, *nonmaleficence* is the avoidance of harm or hurt. In health care ethics, ethical practice involves not only the will to do good but also the equal commitment to do no harm.
4. **The correct answer is 1.** *Beneficence* refers to taking positive actions to help other people. Commitment to beneficence helps to guide difficult decisions wherein the benefits of a treatment may be challenged by risks to the patient's well-being or dignity.
5. **The correct answer is 4.** *Autonomy* refers to a person's independence. Autonomy represents an agreement to respect another person's right to determine a course of action. Respect for a patient's autonomy is fundamental to the practice of health care. It is why patients are included in all aspects of decision making regarding their care.
6. **The correct answer is 2.** The value of autonomy is to respect a patient's choice or self-determination.
7. **The correct answer is 3.** Advocacy calls for the nurse to allow patients' opinions to be heard (give patients a voice) and to speak out for those who cannot speak.
8. **The correct answer is 3.** The nurse does not make decisions for the patient. Advocating for the patient includes protecting the patient's right to choice by providing information, obtaining informed consent for all nursing care, and respecting patients' decisions.
9. **The correct answer is 1.** Relational ethics explores the notion of relationships as a central activity of human behaviour. Scholars who write about relational ethics maintain that relationship is central to everything that nurses do and reflects a way of "being," displayed in everyday interactions rather than a mode of decision making.
10. **The correct answer is 2.** Each step in the processing of an ethical dilemma resembles steps in critical thinking. The nurse begins by gathering information and moves through assessment and identification of the problem, planning a solution, implementation of a solution, and evaluation of the results.

Chapter 8

Chapter 7

1. **The correct answer is 3.** By understanding their personal values, nurses better understand their patients' and colleagues' values. In "value conflict," personal values are at odds with those of a patient, a colleague, or an institution. Values clarification plays a major role in resolving these dilemmas.
1. **The correct answer is 1.** Statute law is created by elective legislative bodies such as Parliament and provincial or territorial legislatures. Examples of provincial statutes are the nursing practice acts throughout the country, which describe and define nursing practice within each province.
2. **The correct answer is 1.** Any intentional physical contact such as treating a patient without the patient's consent is considered battery.
3. **The correct answer is 2.** The inappropriate or unjustified use of restraints (e.g., by confining a person to an area, using physical or chemical restraints) may be viewed as false imprisonment.
4. **The correct answer is 4.** Negligence in nursing is conduct that falls below a standard of care established by law. No intent is needed for negligence to occur. It is characterized chiefly by inadvertence, thoughtlessness, or inattention. Therefore, failing to raise the side rails when they are ordered is negligence.

5. **The correct answer is 2.** Obtaining informed consent is part of the physician–patient relationship. If a nurse suspects that a patient does not understand a procedure for which he or she is being asked to give consent or has consented to, the nurse must notify the physician or nursing supervisor.
6. **The correct answer is 4.** If a patient is harmed as a direct result of a nursing student's actions or lack of action, the liability is generally shared by the student, the instructor, the hospital or health care facility, and the university or educational institution.
7. **The correct answer is 4.** A nurse providing emergency assistance at an accident scene would not be covered by an employer's insurance policy because the care given would not be the responsibility of the employer. However, some provinces have passed "Good Samaritan" laws (e.g., Alberta's *Emergency Medical Aid Act*, 1988) that prevent voluntary rescuers from being sued for wrongdoing unless it can be proved that they displayed gross negligence.
8. **The correct answer is 4.** The physician is responsible for directing medical treatment. Nurses are obligated to follow physicians' orders unless they believe the orders are in error, violate hospital policy, or would harm patients.
9. **The correct answer is 3.** Whenever information is requested on a patient by any third parties, including insurance companies or employers, nurses must obtain a signed release by the patient before releasing confidential information.
10. **The correct answer is 4.** Patients can still be identified even if their name is not provided. Individuals can be identified even if a posting is done anonymously or by using a pseudonym. There is a mistaken belief that privacy controls allow the communication to be viewed only by the intended recipient. It is the nurses' role to safeguard all patient information learned in the course of treatment. It is to be shared only on a need-to-know basis with members of the health care team directly involved in the patient's care, when legally required, or where failure to disclose may lead to significant harm.

Chapter 9

1. **The correct answer is 1.** The processes of enculturation and acculturation facilitate cultural learning. Socialization into one's primary culture during childhood is known as *enculturation*.
2. **The correct answer is 2.** In Canada, rather than assimilation, the preferred outcome is multiculturalism, in which immigrants and other people maintain their cultures and different people of diverse cultures interact peacefully within the nation. Canadians believe, as enshrined in the multiculturalism policy, that citizens should be able to retain their unique ethnic cultures and traditions within a Canadian context.
3. **The correct answer is 1.** Cultural awareness is being aware of one's own background, and it involves an in-depth self-examination to recognize biases, prejudices, and assumptions about other people.
4. **The correct answer is 2.** Cultural safety is the outcome of nursing education that enables safe service to be defined by those who receive the service.
5. **The correct answer is 1.** Ethnocentrism is the root of stereotypes, biases, and prejudices against other people who are perceived to be different from the valued group.
6. **The correct answer is 1.** When a person acts on his or her prejudices, discrimination—treating people unfairly on the basis of their group membership—occurs.
7. **The correct answer is 4.** The dominant value orientation in North American society is individualism and self-reliance in achieving and maintaining health. Caring approaches generally promote the patient's independence and ability for self-care.
8. **The correct answer is 3.** Disparities in health outcomes between rich and poor patients illustrate the influence of socioeconomic factors on morbidity and mortality. Social factors such as poverty and lack of access to health resources compromise the health status of poor and unemployed patients.
9. **The correct answer is 3.** Global health focuses on issues that directly or indirectly affect health but that can transcend national boundaries.
10. **The correct answer is 4.** The high value that Western society places on individual autonomy and self-determination may be in direct conflict with the values of diverse groups. Advance directives, informed consent, and consent for hospice are examples of mandates that may violate patients' values.

Chapter 10

1. **The correct answer is 3.** Transformational leadership most fundamentally involves developing relationships to inspire people to be involved in co-creating a vision for change and healthy work environments and positive health outcomes.
2. **The correct answer is 3.** The collaborative practice model is the most inclusive of patient participation in care, and patient centredness is foundational to this model.
3. **The correct answer is 1.** Case management is a care management approach that coordinates and links health care services to patients and their families while streamlining costs and maintaining quality.
4. **The correct answer is 4.** Working in a decentralized structure has the potential for greater collaborative effort, increased staff competency, and a greater sense of professional accomplishment and satisfaction.
5. **The correct answer is 3.** Accountability means being answerable for one's actions. It involves follow-up and reflection on one's decisions to evaluate effectiveness.
6. **The correct answer is 2.** Research shows that the staffing model is an important determinant of a high-quality work life and patient safety.
7. **The correct answer is 1.** It is most important to value the experiences and perspectives of the UCPs and to seek input before setting up educational and support systems.
8. **The correct answer is 1.** First-order priority needs represent an immediate threat to a patient's survival or safety, such as an obstructed airway, loss of consciousness, or an anxiety attack.
9. **The correct answer is 4.** UCPs should not be assigned sole responsibility for patient care. The nurse in charge of patient care decides which activities the UCP can perform independently and which activities must be performed by the nurse and UCP in partnership. UCPs are trained to bathe patients.
10. **The correct answer is 3.** A nurse-sensitive outcome reveals whether interventions are effective, whether patients progress or remain safe, how well standards are being met, and whether changes are necessary. A patient outcome is a measure of the patient's health status as a result of implementing best practice guidelines for preventing falls.

Chapter 11

1. **The correct answer is 1.** An important aspect of critical thinking is reflection: the process of purposefully thinking back or

recalling a situation to discover its purpose or meaning. Nurses should think back on a patient situation, make sense of the experience, and thus gain insight into the meaning of the situation.

2. **The correct answer is 3.** At the basic level of critical thinking, a learner trusts that experts have the right answers for every problem. Thinking is concrete and based on a set of rules or principles. For example, a nurse uses an institution's procedures manual to confirm how to complete a specific procedure.
3. **The correct answer is 2.** The nursing process consists of five steps: assessment, nursing diagnosis, planning, implementation, and evaluation. During the evaluation phase, the nurse evaluates whether the nursing action has been effective.
4. **The correct answer is 3.** The nurse's knowledge base is an important component of critical thinking. It varies according to a nurse's educational experience, including basic nursing education, continuing education courses, and additional university degrees. In addition, it includes the initiative a nurse shows in reading the nursing literature to remain current in nursing science.
5. **The correct answer is 3.** The nurse notices that the intravenous infusion is not functioning correctly and uses his or her knowledge to solve the problem.
6. **The correct answer is 1.** The nurse makes an inference about how well the patient is coping based on the patient's descriptions of how the death of her sister has affected her day-to-day activities (i.e., draws a conclusion based on patterns of behaviour indicative of ineffective coping).
7. **The correct answer is 3.** Based on an assessment and analysis of the physical signs and symptoms, the nurse diagnoses the patient's health status.

Chapter 12

1. **The correct answer is 4.** The other answers relate to diagnosis and intervention, rather than assessment.
2. **The correct answer is 3.** Analyzing and interpreting data, documentation, and sharing of data with other health care providers cannot be done until data is validated and determined accurate.
3. **The correct answer is 4.** Documenting nursing care and reviewing data with other health care providers are part of intervention, not assessment. Making inferences is the step after data clustering.
4. **The correct answers are 1, 3, and 5.** These symptoms are related to the respiratory system and adequate oxygen intake. The others relate to other body systems.
5. **The correct answer is 3.** Diagnosis and treatment of patients' responses describes the entire nursing process; a common nursing language refers to the process of developing nursing diagnoses; identification of a disease refers to evaluation. A nursing diagnosis for an individual patient is the clinical judgement about responses to actual and potential health problems or life processes.
6. **The correct answer is 4.** Data collection, clustering, and interpretation are part of assessment.
7. **The correct answer is 4.** Evaluating nursing care is evaluation, gathering patient information is assessment, and helping nurses focus on their role refers to the entire nursing process.
8. **The correct answer is 4.** A wellness nursing diagnosis describes levels of wellness in an individual, family, or community that can be enhanced. A risk nursing diagnosis describes human responses to health conditions or life processes that may develop in a vulnerable individual. An actual

nursing diagnosis describes responses to health conditions or life processes that exist in an individual, family, or community. A potential nursing diagnosis is one under consideration during data interpretation.

9. **The correct answer is 2.** A wellness nursing diagnosis describes levels of wellness in an individual, family, or community that can be enhanced. A risk nursing diagnosis describes human responses to health conditions or life processes that may develop in a vulnerable individual. An actual nursing diagnosis describes responses to health conditions or life processes that exist in an individual, family, or community. A potential nursing diagnosis is one under consideration during data interpretation.
10. **The correct answer is 1.** Risk factors are evidence considered during assessment; related factors are those contributing to the diagnosis; the complete statement is the nursing diagnosis.
11. **The correct answer is 2.** The patient is the best source of information.
12. **The correct answer is 4.** "*Diarrhea related to intestinal colitis*" refers to a medical condition not responsive to nursing care.
13. **The correct answers are 1 and 2.** The other answers are related factors but do not define the primary diagnosis.

Chapter 13

1. **The correct answers are 2 and 3.** Controlling pain and monitoring vital signs are important direct care priorities for safe and effective care for a patient who has just returned from the recovery room. Family visits and end-of-shift reports are important, but they are not high priorities in the immediate recovery period.
2. **The correct answer is 1.** Maintaining proper drainage of the wound is a high priority for this patient immediately after surgery. The condition of the intravenous dressing, the patient's comfort, and obtaining more intravenous fluids are important, but they do not have the highest priority in this situation.
3. **The correct answers are 1 and 2.** The descriptions "afebrile until discharge" and "without phlebitis by the third postoperative day" reflect the actual condition or state of the patient.
4. **The correct answer is 4.** Rating pain acuity on a scale is the only report of the expected outcome in measurable terms.
5. **The correct answer is 4.** *Collaboration* means that a number of health care providers are involved in care.
6. **The correct answer is 3.** Successful planning requires that you collaborate with the patient and family, consult with other members of the health care team, and review relevant literature. Critical pathways are care plans that detail the essential steps in the care of patients with a specific clinical problem and describe the expected progress of the patient. Concept mapping provides a visual representation showing the connections between many problems.
7. **The correct answer is 2.** Restraining a violent patient is an example of a life-saving measure to protect the patient. Administering analgesics is a physical care technique; it is not a life-saving measure. Stress-reduction therapy is an example of a counselling technique. Teaching the patient how to take his or her pulse is an example of the nursing intervention of teaching.
8. **The correct answer is 1.** Patient safety always comes first.
9. **The correct answer is 2.** A concept map is a diagram of patient problems and interventions that shows their relations to one another. This process promotes critical thinking and helps the nurse to organize complex patient data and achieve a holistic

view of the patient's situation. The purpose is not quality assurance in the health care facility. Multidisciplinary communication is enhanced through the use of critical pathways. Standardized care plans, not concept maps, provide a standardized format for patient problems.

Chapter 14

1. **The correct answer is 3.** Auscultation of lung sounds is an evaluation of the effectiveness of suctioning, which is the nursing intervention being evaluated.
2. **The correct answers are 2 and 4.** Evaluative criteria must relate to the intervention (suctioning) that is intended to clear the patient's airway and lungs to promote normal breathing. Drinking water and reporting abdominal pain are not directly associated with breathing.
3. **The correct answer is 1.** Goals and expected outcomes are objective criteria developed in the plan of care used to judge a patient's response to care. Answers 2 and 4 are both subjective observations of the nurse based on patient feedback.
4. **The correct answer is 3.** Determining adherence to the medical regime is the priority. Antibiotics must be taken routinely and consistently to maintain adequate blood levels. Additional data are required related to the plan of care prior to pursuing other nursing interventions.
5. **The correct answer is 3.** Arranging for five small meals daily reflecting the patient's cultural preferences is an independent intervention and does not require a physician's order. Small frequent feedings palatable to the patient spread throughout the day provide a volume that is not as overwhelming as a full meal. Patients must not be forced to eat all their meals; the portions may be too large for an anorectic patient to ingest. Adding between meal supplements is a dependent intervention and requires a physician's order. The problem is not the number of calories provided at mealtime but the amount of food the patient is able to ingest at any one time.

Chapter 15

1. **The correct answer is 1.** This information about a fellow nursing student is confidential. You cannot share it with classmates or visit him because you learned of his admission accidentally in the course of your work. You have no right to access his EHR because you are not caring for him.
2. **The correct answer is 4.** Enter only objective descriptions of the patient's behaviour, not opinions or judgements. Do not write retaliatory or critical comments about a patient; in a court of law, such comments can be used as evidence of nonprofessional behaviour or poor quality of care.
3. **The correct answer is 3.** Subjective data is what the patient says, and this is often his or her own words in quotation marks.
4. **The correct answer is 4.** Enter only objective descriptions of the patient's behaviour, not opinions or judgements. Do not write retaliatory or critical comments about patient; in a court of law, such comments can be used as evidence of nonprofessional behaviour or poor quality of care.
5. **The correct answer is 1.** Patients frequently request copies of their health records, and they have the right to do so. Each institution has policies for controlling the manner in which records are shared. In most situations, patients are required to give written permission for release of medical information.
6. **The correct answer is 4.** Use complete, concise descriptions of care so that documentation is objective and factual. Avoid using empty phrases such as "well tolerated," which is too generalized and has no meaning.

7. **The correct answer is 3.** Acuity records (also known as workload measurement systems) provide a method of determining the hours of care and staff required for a given group of patients. A patient's acuity level is based on the type and number of nursing interventions required for providing care in a 24-hour period.
8. **The correct answers are as follows:** S = 2, O = 4, A = 3, P = 1. S stands for *subjective*: "The pain increases every time I try to turn on my left side." O stands for *objective*: Left lower abdominal surgical incision, 3 inches in length, closed, sutures intact, no drainage. Pain noted on mild palpation. A stands for *assessment*: Acute pain related to tissue injury from surgical incision. P stands for *plan*: Repositioned patient on right side. Encouraged patient to use patient-controlled analgesia.

Chapter 16

1. **The correct answer is 3.** Changes in the health care system have led to an increased need for high-quality, comparable, aggregated data to support effective decision making—whether decisions at the clinical level, the local or regional level, or the system level. Nurses recognize the value of adopting technology to support evidence-informed professional practice, innovation, and nursing data collection and representation.
2. **The correct answer is 4.** Nursing needs standardized documentation to facilitate aggregation of nursing data, to support comparison and analysis, to enhance communication among nurses, and to improve representation regarding nursing contributions.
3. **The correct answer is 2.** The CNA formally adopted ICNP® as the terminology of choice for professional nursing practice. Standardized nursing terminology using ICNP® is being implemented via the C-HOBIC project. This project will examine nursing sensitive outcomes and compare these measures across various clinical settings. Because all outcomes are coded using ICNP®, this comparison will have a stronger impact and allow for greater analysis.
4. **The correct answer is 1.** Although all nurses must practise using both the Standards of Care (provincial legislation) and the national *Code of Ethics*, all nurses must be aware of both pieces of federal legislation governing the privacy of health information in Canada. The *Privacy Act* and the *Personal Information Protection and Electronic Documents Act* (PIPEDA) prohibit nurses from disclosing personal health information about any patient, with very limited exceptions.
5. **The correct answer is 3.** Nurses can enact the E-Nursing Strategy by engaging in advocating for access and participation and engaging in developing their competencies. Additionally, you should work toward the seven key outcomes as identified by CNA. These include the following:
 - a. Integrating ICT into your practice to achieve good patient outcomes
 - b. Having the required information and knowledge to support your practice
 - c. Facilitating human resources planning
 - d. Support for new models of nursing practice and health services delivery
 - e. Improved connections between nursing groups
 - f. Improved quality of nurses' work environments
 - g. Contributing to the global community of nursing
6. **The correct answer is 1.** Many professional and informal nursing communities are available to foster nurses' engagement in the informatics communities. Canada Health Infoway solicits clinician engagement in support of development of the

pan-Canadian EHR. You can be a voluntary member of any (or several) Standards Collaborative Working Groups (SCWG) and contribute to specific aspects of EHR development. The Canadian Nursing Informatics Association (CNIA) is the national group that all nurses are welcome to join. Additionally, many provinces have special interest groups that are dedicated to nursing informatics. COACH is also another choice for nurses to join a national Canadian group. International opportunities include AMIA, IMIA-SIGNI, and HISA. You may also consider other informal communities such as listservs, wikis, blogs, and other social networks such as Facebook. It is critical, however, to remember that most informal communities are not held to the professional content standards as those of more formal organizations, and content should be considered with caution.

Chapter 17

1. **The correct answer is 4.** Assessment of a patient's ability to communicate includes gathering data about the many contextual factors that influence communication. These include the participants' internal factors and characteristics, the nature of their relationship, the situation prompting communication, the environment, and the sociocultural elements present. Assessing these contextual factors helps you make sound decisions during the communication process.
2. **The correct answer is 3.** Active listening means to be attentive to what the patient is saying both verbally and nonverbally. The acronym *SOLER* represents facilitative skills for attentive listening: *S* (sit facing the patient); *O* (observe an open posture; that is, keep arms and legs uncrossed); *L* (lean toward the patient); *E* (establish and maintain intermittent eye contact); *R* (relax).
3. **The correct answer is 1.** A helping relationship between nurse and patient does not just happen; it is created with care and skill and is built on the patient's trust in the nurse. During the orientation phase of a relationship, the nurse sets the tone for the relationship by adopting a warm, empathic, and caring demeanour. During this phase, the relationship is often superficial, uncertain, and of a social nature. The phase is a period of getting to know each other and establishing trust.
4. **The correct answer is 3.** Interacting with patients who have conditions that impair communication requires sensitivity and creativity. Communication techniques must be adapted to the patient's unique circumstances and sensory, motor, and cognitive needs. The nurse must be patient, ask simple questions, encourage the patient to converse, and allow sufficient time for the patient to understand and respond. Visual cues and communication aids may be useful in communicating with aphasic patients.
5. **The correct answer is 1.** Nurses function in roles that require interaction with multiple members of the health care team. Many elements of the nurse-patient helping relationship are also applied in these collegial relationships, which are focused on accomplishing the work and goals of the clinical setting. It is especially important to involve the patient and family in decisions about the plan of care to determine whether suggested methods are acceptable.
6. **The correct answer is 3.** *Clarifying* means checking whether understanding is accurate, as in restating an unclear or ambiguous message to elicit the sender's meaning. Instead of restating the message, you can also ask the other person to rephrase it, explain further, or give an example of what he or she means.
7. **The correct answer is 4.** Focusing is used to centre on key elements or concepts of a message. If conversation is vague

or rambling, or if patients begin to repeat themselves, focusing is a useful technique.

8. **The correct answer is 2.** Intrapersonal communication, or self-talk, is a powerful communication tool. It strongly influences perceptions, feelings, self-concept, and behaviour and can replace negative thoughts with positive assertions.
9. **The correct answer is 2.** A tip for improved communication with older adults is to stick to one topic at a time.
10. **The correct answer is 2.** In the zones of personal space and touch, the personal zone (45 cm to 1 m) includes nursing activities such as sitting at a patient's bedside and documenting the patient's health history.

Chapter 18

1. **The correct answer is 4.** Touch is one way to offer comfort and communicate concern and support. Touch leads to a connection between nurse and patient. However, touch can convey many messages; it must be used with discretion.
2. **The correct answer is 4.** To know a patient means that the nurse avoids assumptions, focuses on the patient, and engages in a caring relationship with the patient that reveals information and cues that facilitate critical thinking and clinical judgments. Knowing the patient is at the core of the process by which nurses make clinical decisions.
3. **The correct answer is 2.** Enabling is the caring process that helps the new mother's passage through the life transition of birthing. This process is accomplished by preserving dignity, explaining, supporting, focusing, and providing treatment alternatives.
4. **The correct answer is 4.** Spiritual health is achieved when people find a balance between their own life values, goals, and belief systems and those of others. Research has shown a link between spirit, mind, and body. An individual's beliefs and expectations can and do have effects on the person's physical well-being.
5. **The correct answer is 3.** Strategies to enable nurses to demonstrate more caring behaviours include introducing greater flexibility into the work environment structure, rewarding experienced nurse mentors, improving nurse staffing, and providing nurses with autonomy over their practice.
6. **The correct answer is 1.** A nurse demonstrates caring by helping family members become active participants in a patient's care.
7. **The correct answer is 4.** Listening includes not only "taking in" what a patient says but also interpreting and understanding what is said and reflecting that understanding to the person talking.
8. **The correct answer is 3.** Presence involves a person-to-person encounter that conveys closeness and a sense of caring that involves "being there" and "being with" patients.
9. **The correct answer is 1.** Knowing the behaviours that patients perceive as caring helps nurses to understand what patients expect of them as caregivers. Establishing a reassuring presence, recognizing an individual as unique, and being attentive to the patient are recurrent caring behaviours identified by researchers. Each patient has a unique background of experiences, values, and cultural perspectives; however, understanding common behaviours that patients associate with caring will help you learn to express caring in practice.

Chapter 19

1. **The correct answer is 4.** The nurse must think of family as defined by each individual. In other words, the nurse can

think of the family as a set of relationships that the patient identifies as family or as a network of individuals who influence each other's lives, whether the ties actually are biological or legal.

2. **The correct answer is 2.** The blended family is formed when both parents bring children from previous relationships into a new, joint living situation or when children from the current union and children from previous unions are living together.
3. **The correct answer is 4.** The proportion of teenagers giving birth has been declining steadily since the 1980s, probably as a result of increased sexual education, the availability of contraceptives, and the use of abortion.
4. **The correct answer is 4.** The family is the primary social context in which health promotion and disease prevention take place. The family's beliefs, values, and practices also strongly influence health-promoting behaviours of its members.
5. **The correct answer is 3.** Health promotion researchers have focused on the stress-moderating effect of hardiness and resiliency as factors that contribute to long-term health. Family hardiness is the internal strengths and durability of the family unit. Family resiliency is the ability to cope with expected and unexpected stressors.
6. **The correct answer is 2.** When the family as patient is the approach, you focus on the entire family, its processes and relationships (e.g., parenting or family caregiving).
7. **The correct answer is 1.** *Internal structure* refers to the people who are included in the family and how they are connected to each other. Specifically, this question assesses family composition, a subcategory of internal structure. *Family composition* refers to the individual members who form the family. The family composition is not limited to the traditional nuclear family; instead, it may include any of the various family forms.
8. **The correct answer is 3.** In considering family nursing from a relational inquiry perspective, there is an explicit focus on understanding the family in context (sociocultural, geopolitical, and economic contexts).
9. **The correct answer is 3.** Letting be and change, as well as emancipatory action, are two of the assessing and intervening approaches described by Hartrick Doane and Varcoe (2005) in *Family nursing as relational inquiry: Developing health promoting practice* (p. 288).
10. **The correct answer is 4.** *Expressive functioning* refers to the ways in which people communicate. Emotional communication is a subcategory of expressive functioning and encompasses the range and types of feelings that are expressed by the family.
11. **The correct answer is 1.** Circular questions facilitate change by inviting the family to discover their own answers; they help explain a problem.
12. **The correct answer is 3.** In an effective family interview, the nurse can engage a family to assess, explore, and identify strengths and problems. The nurse can also decide to intervene or refer the family to another health care professional.

Chapter 20

1. **The correct answer is 3.** Psychomotor learning involves acquiring skills that require the integration of mental and muscular activity; therefore, teaching a patient to use a walker requires the use of the psychomotor domain. The patient

masters skills by manipulating equipment and practising manual skills.

2. **The correct answer is 2.** If a patient's learning ability is impaired or if distractions are present, the nurse should modify or postpone teaching activities. Any physical condition (e.g., pain, fatigue, or hunger) that depletes energy also impairs the ability to learn. Therefore, the nurse should teach the patient when pain medications are working.
3. **The correct answer is 3.** Readiness to learn is related to the grieving stage. Patients cannot learn when they are unwilling or unable to accept the reality of illness. However, properly timed teaching can help a patient to adjust to illness or disability. When a patient is in denial or disbelief, you should teach in the present tense (e.g., explain what patient needs to know to be discharged).
4. **The correct answer is 4.** As a child matures, intellectual growth moves from concrete to abstract. By developing topics for discussion that require problem solving, the nurse is considering the adolescents' level of development and will engage the students in learning about nutrition.
5. **The correct answer is 3.** Behavioural objectives are measurable and observable and indicate how learning will be evidenced. An objective is more precise when it describes the conditions or timing under which the behaviour occurs (e.g., the patient will perform breast self-examination correctly before the end of the teaching session).
6. **The correct answer is 1.** The telling approach is useful when limited information must be taught (e.g., preparing a patient for an emergency diagnostic procedure).
7. **The correct answer is 3.** Role play helps teach new ideas and attitudes. During role play, patients play themselves or someone else and rehearse a desired behaviour.
8. **The correct answer is 1.** Learning disabilities are disorders that may impair ability to acquire, organize, remember, understand, or apply information. When teaching patients with learning disabilities or other barriers to learning, a recommended technique is to demonstrate procedures such as measuring dosages and then ask for return demonstrations (provides opportunity to clarify instructions and time to review procedures).
9. **The correct answer is 2.** In general, teaching and learning begin when a person identifies a need for knowing or acquiring an ability to do something.
10. **The correct answer is 1.** Demonstrations help teach psychomotor skills such as preparing a syringe. The patient is able to observe a skill before practising it.

Chapter 21

1. **The correct answer is 4.** Growth is the quantitative, or measurable, aspect of an individual's increase in physical measurements. Measurable growth indicators include changes in height, weight, teeth, skeletal structures, and sexual characteristics.
2. **The correct answer is 1.** Moral development is the ability of an individual to distinguish right from wrong and to develop ethical values on which to base his or her actions.
3. **The correct answer is 1.** Organicism is a theoretical focus on the organism itself. According to theories in this tradition, development is a result of biologically driven behaviour and the person's adaptation to the environment.
4. **The correct answer is 1.** Three major categories of factors influence human growth and development: genetics,

environment, and the interaction between these two. The family is an example of an environmental factor. Family influences through its values, beliefs, customs, and specific patterns of interaction and communication.

5. **The correct answer is 4.** Psychiatrist Robert Havighurst believed his findings described a sequential process that takes place between the internal life (personality) of adults and their outer world (culture, lifestyle).
6. **The correct answer is 4.** The zone of proximal development, described by Vygotsky, is the difference between a child's current developmental achievement and a child's capabilities, given their physical and emotional maturation level. For example, a 12-month-old child may be walking by holding on to furniture but be developmentally able to walk independently. A sensitive caregiver could help the child achieve independent walking by encouraging activities that help the child gain confidence to walk alone.
7. **The correct answer is 1.** During formal operations, the individual's thinking moves to abstract and theoretical subjects. Thinking can venture into such subjects as achieving world peace, finding justice, and seeking meaning in life. Adolescents can organize their thoughts in their minds. New cognitive powers allow the adolescent to achieve more far-reaching problem solving.
8. **The correct answer is 2.** The microsystem consists of the immediate settings, activities, and personal relationships of the individual. Examples of microsystems are family, classroom, workplace, or recreation group.
9. **The correct answer is 3.** According to Keating and Hertzman's (1999) population health approach, human development is a population phenomenon. They referred to the strong association between the health of a population, developmental outcomes, and the social and economic forces affecting the larger society. Therefore, improving community housing would be an attempt to improve the health of the population.
10. **The correct answer is 4.** According to resilience theory, protective processes shield people from adversity and include social supports, such as high-quality day care.

Chapter 22

1. **The correct answer is 1.** Maternal risk factors associated with preterm labour include physiological stresses such as renal and cardiovascular disease, diabetes mellitus, and uterine and cervical abnormalities.
2. **The correct answer is 2.** Fathers are a major source of breastfeeding support and their knowledge and encouragement of breastfeeding can influence initiation and duration (Rempel & Rempel, 2010).
3. **The correct answer is 2.** Healthy infants begin their routine immunization schedule at two months of age so that they may be protected against infectious diseases as early as possible.
4. **The correct answer is 4.** According to Piaget (1952), during the preoperational thought stage of cognitive development, toddlers recognize that they are separate beings from their mothers, but they are unable to assume another person's viewpoint. They use symbols to represent objects, places, and people. This function is demonstrated when children imitate the behaviour of another person that they viewed earlier (e.g., pretend to shave like their daddy).
5. **The correct answer is 3.** The play of preschool children becomes more social after the third birthday as it shifts from

parallel to associative play. Most three-year-old children are able to play with one other child in a cooperative manner in which they make something or play designated roles such as mother and baby. By the age of four years, children play in groups of two or three, and by five years, the group has a temporary leader for each activity.

6. **The correct answer is 2.** Preschoolers average 12 hours of sleep a night and take infrequent naps.
7. **The correct answer is 4.** The nurse is legally required to report all cases of suspected child abuse or neglect to authorities.
8. **The correct answer is 1.** Obesity has become the most common nutritional disturbance in childhood. You can help children avoid this problem by teaching about and encouraging a balanced healthy diet, promoting physical exercise and limiting inactivity, and promoting a healthy body image.
9. **The correct answer is 3.** Good communication skills are critical for overcoming peer pressure and unhealthy behaviours. The following are some hints for communicating with adolescents: do not avoid discussing sensitive issues, ask open-ended questions, look for the meaning behind their words or actions, be alert to clues to their emotional state, and involve other individuals and resources when necessary.
10. **The correct answer is 3.** Injuries, including self-inflicted injuries and injuries caused by motor vehicle accidents and poisoning, are the leading cause of death in adolescents.

Chapter 23

1. **The correct answer is 2.** Most young adults have completed physical growth by the age of 20 years.
2. **The correct answer is 1.** Your role in health promotion is to identify lifestyle risk factors and provide education and support to reduce unhealthy behaviours.
3. **The correct answer is 4.** When determining the amount of information the individual needs to make decisions about the prescribed course of therapy, you should consider factors that may affect the individual's compliance with the regimen, including educational level, socioeconomic factors, motivation, and desire to learn.
4. **The correct answer is 4.** A common physiological change in the second trimester is quickening, which is the sensation of fetal movements as experienced by the pregnant woman.
5. **The correct answer is 2.** Accidents are the leading causes of accidental injury for young adults.
6. **The correct answer is 2.** Close friends and associates of the single young adult may also be viewed as the individual's "family."
7. **The correct answer is 3.** A family history of a disease may put a young adult at risk for developing that disease in the middle or older adult years. For example, if a young man's father and paternal grandfather had myocardial infarctions (heart attacks) in their 50s, his risk for a future myocardial infarction is increased.
8. **The correct answer is 3.** In the middle adult years, as children depart from the household, the family enters the postparental family stage. Time and financial demands on the parents decrease, and the couple faces the task of redefining their relationship.
9. **The correct answer is 3.** Health teaching and health counselling are often directed at improving health habits.
10. **The correct answer is 3.** The physiological response to stress can be avoided. You use relaxation techniques, imagery, and biofeedback to recondition the patient's response to stress.

Chapter 24

1. **The correct answer is 4.** Two factors contribute to the projected increase in the number of older adults: the aging of the baby-boom generation and the growth of the population segment older than 85 years. The baby boomers are the adults born between 1946 and 1964.
2. **The correct answer is 3.** Various theorists have attempted to describe the complex biopsychosocial process of aging. Although many theories have been developed, no single universally accepted theory predicts and explains the complexities of the aging process.
3. **The correct answer is 3.** The three common conditions affecting cognition are delirium, dementia, and depression. The nurse may find that distinguishing among these three conditions is challenging but essential.
4. **The correct answer is 2.** Sexuality is increasingly recognized as an important factor in the lives of older adults. All older adults, whether healthy or frail, need to express sexual feelings. Sexuality involves love, warmth, sharing, and touching, not just the act of intercourse.
5. **The correct answer is 1.** The libido does not decrease in older adults, although frequency of sexual activity may decline. An older woman who does not understand physical changes affecting sexual activity may be concerned that her sex life is nearly over. The older man may feel the same when he discovers a change in the firmness of his erection, a decreased need for ejaculation with each orgasm, or a longer recovery period between episodes of intercourse.
6. **The correct answer is 3.** Presbyopia (the gradual decline in the ability to focus on near objects) is common in older adults.
7. **The correct answer is 1.** Presbycusis, common in older adults, is a decrease in the ability to hear high-pitched sounds and sibilant consonants such as "s," "sh," and "ch."
8. **The correct answer is 1.** Taste buds atrophy and lose sensitivity. Older adults are less able to discern among salty, sweet, sour, and bitter tastes.
9. **The correct answer is 4.** The anteroposterior diameter of the thorax increases. The incidence of osteoporosis is increased in older adults; vertebral changes caused by osteoporosis lead to dorsal kyphosis, the curvature of the thoracic spine sometimes called "dowager's hump."
10. **The correct answer is 1.** Frontotemporal dementia has an insidious onset and progresses slowly. Early symptoms include poor hygiene, lack of social tact, hyperorality, and sexual disinhibition. Incontinence is an early symptom in frontotemporal dementia, whereas it is a late symptom in the more common Alzheimer's disease.

Chapter 25

1. **The correct answer is 2.** Self-concept is how a person thinks about himself or herself. It is a subjective sense of the self and a complex mixture of unconscious and conscious thoughts, attitudes, and perceptions. Mastectomy is a surgical procedure that alters the appearance and function of the body. Although the changes may not be apparent to other people when the individual is dressed, these bodily changes have a significant impact on the individual.
2. **The correct answer is 2.** One of the self-concept developmental tasks of one- to three-year-olds is developing self through modelling, imitation, and socialization.
3. **The correct answer is 4.** Identity involves the internal sense of individuality, wholeness, and consistency of a person over time and in various circumstances.

4. **The correct answer is 3.** Body image depends only partly on the reality of the body. Body image involves attitudes related to the body, including physical appearance, structure, or function. Feelings about body image include those related to sexuality, femininity and masculinity, youthfulness, health, and vitality. These mental images are not always consistent with a person's actual physical structure or appearance.
5. **The correct answer is 1.** Through the process of reinforcement-extinction, certain behaviours become common or are avoided, depending on whether they are approved and reinforced or are discouraged and punished.
6. **The correct answer is 4.** Through the process of identification, an individual internalizes the beliefs, behaviour, and values of role models into a personal, unique expression of self.
7. **The correct answer is 3.** An individual's identity is affected by stressors throughout life but is particularly vulnerable during adolescence, a time characterized by many changes.
8. **The correct answer is 1.** Identity confusion results when a person does not maintain a clear, consistent, and continuous consciousness of personal identity.
9. **The correct answer is 3.** By asking patients how they feel about themselves, the nurse is seeking information about their self-esteem.
10. **The correct answer is 1.** Increasing the patient's self-awareness is achieved through establishing a trusting nurse-patient relationship that allows the patient to openly explore thoughts and feelings.

Chapter 26

1. **The correct answer is 3.** *Gender identity* refers to the degree to which a person identifies as male, female, or some combination. It begins in early childhood as the child becomes aware of the differences of the sexes and perceives that he or she is male or female.
2. **The correct answer is 2.** *Sexual health* means that a person has freedom from physical and psychological impairment, awareness of and positive attitudes toward sexual functioning, and accurate knowledge about sexuality.
3. **The correct answer is 4.** Sexual dysfunction is the absence of complete sexual functioning.
4. **The correct answer is 1.** A major problem in dealing with STIs is that symptoms are absent or go unnoticed. Finding and treating the people who have them can be difficult. Some people who are infected may not even know that they are.
5. **The correct answer is 2.** The most common bacterial STI is genital chlamydia. (HIV infection and AIDS are viral STIs.) A chlamydial infection may cause an abnormal genital discharge and burning with urination. There are many serious complications of genital chlamydia in women, including chronic pelvic pain, infertility, and ectopic pregnancy.
6. **The correct answer is 1.** Contraceptive methods that require a health care provider's intervention include hormonal contraception, intrauterine devices (IUDs), the diaphragm, the vaginal contraceptive ring, the cervical cap, and surgical procedures (vasectomy and tubal ligation).
7. **The correct answer is 2.** Effectiveness rates are as follows: for birth control pills, 98% to 99%; for the contraceptive sponge, 80% to 91%; for vaginal spermicides, 78% to 90%; and for the female condom, 79% to 85%.
8. **The correct answer is 2.** The most valuable tool that you can use when providing care in areas of sexuality is effective, nonjudgemental communication. A perceptive and educated approach to talking about sexuality can offer the support that

many patients require. Effective communication about sexuality requires caring, sensitivity, tact, compassion, the use of appropriate language, and nondiscriminatory attitudes.

9. **The correct answer is 3.** When caring for older adults, you may adjust your assessment approach. When gathering a sexual history from an older adult, it is important to keep in mind that the patient may have difficulty discussing intimate details with health care providers. You are responsible for helping maintain the sexuality of older adults by offering the opportunity to discuss any concerns. Often, asking questions on the topic of sexuality in a comfortable, relaxed manner facilitates older adults' discussion of their sexual needs.
10. **The correct answer is 1.** A useful framework to guide planning is the PLISSIT model developed by Annon (1976). P stands for "permission giving." During assessment, you can bring up the topic of sexuality and can give the individual permission to talk about sexual concerns. LI stands for "limited information," which is basic information regarding sexuality and sexual functioning. SS stands for "specific suggestions," whereby you provide specific suggestions regarding a sexual concern or issue. If you are not equipped to address a particular concern, you should refer the patient to another health care provider. IT stands for "intensive therapy." At this level of intervention, your role is to refer the patient to a qualified practitioner, such as a social worker or a sex counsellor, for individualized therapy.

Chapter 27

1. **The correct answer is 3.** Caring for a patient's spiritual needs means caring for the whole person, accepting his or her beliefs and experiences, and helping the patient with issues surrounding meaning and hope. Praying for the patient and calling for a religious leader may be appropriate in some situations but those situations must be directed by the patient and considered carefully.
2. **The correct answer is 2.** Atheists do not believe in the existence of God. Agnostics believe that any ultimate reality is unknown. This does not mean that spirituality is not an important concept for the atheist or agnostic. Atheists search for meaning in life through their work and their relationships with other individuals. However, it is important not to assume that spirituality would be an acceptable term to describe this search for meaning because of its long relationship to religion.
3. **The correct answer is 4.** Research has indicated that providing structure and support for patients' rituals and practices is an important intervention. This is not always assigned a high priority by nurses because they may not see it as an important part of modern medicine. However, it is important to note that it is often a critical part of a patient's personal medicine.
4. **The correct answer is 1.** Presence is an important way of being with patients that facilitates spiritual care.
5. **The correct answer is 2.** Those from the Hindu religion may observe important days of fasting. It is important to understand and facilitate that practice.
6. **The correct answer is 4.** Reviews of spirituality in the literature have indicated that it is associated with meaning, purpose, hope, and connectedness. Although spirituality is closely affiliated with religion in some individuals, individuals on a spiritual journey may or may not describe themselves as religious.
7. **The correct answer is 1.** Research has indicated that patients prefer support for their own spiritual practices rather than the more intimate interventions that may be implemented by nurses. Patients also want nurses to know about their spiritual practices and appreciate the little extras that nurses do to make them feel cared for.
8. **The correct answer is 4.** Values are an important part of religion and spirituality. Times of grief and suffering may lead to changes in those values.
9. **The correct answer is 4.** Spiritual assessment requires a great deal of sensitivity and should be adapted to the circumstances.
10. **The correct answer is 2.** Relational practice is foundational for all of nursing care and helps to create an environment for sensitive spiritual care.

Chapter 28

1. **The correct answer is 1.** An actual loss is any loss of a person or object that can no longer be felt, heard, known, or experienced by the individual. Lost objects that have been valued by a patient include any possession that is worn out, misplaced, stolen, or ruined.
2. **The correct answer is 2.** A perceived loss is any loss that is uniquely defined by the grieving patient. It may be less obvious to others.
3. **The correct answer is 3.** Situational loss includes any sudden, unpredictable external event.
4. **The correct answer is 4.** During Bowlby's phase of disorganization and despair, an individual may constantly examine how and why the loss occurred.
5. **The correct answer is 4.** During Kübler-Ross's stage of depression, the person finally realizes the full impact and significance of the loss and may feel overwhelmingly lonely and withdraw from interpersonal interaction.
6. **The correct answer is 2.** Worden's task 3 is to adjust to the environment in which the deceased is missing. According to Worden, a person does not realize the full impact of a loss for at least three months. At this point, many friends and associates make less frequent contact, and the person is left to ponder the full impact of loneliness.
7. **The correct answer is 3.** Loneliness and problems associated with completing the tasks of daily living are two of the most common and difficult adjustments for older bereaved spouses.
8. **The correct answer is 4.** Expression of hopefulness is an expected outcome for patients experiencing a loss.
9. **The correct answer is 2.** For transplantation of organs, ventilatory and circulatory support must be maintained until the organs are harvested. The family must clearly understand that the patient is "brain dead" and that the equipment (i.e., ventilator and vasopressor medications) is not keeping the patient alive but keeping the physical body in a state so that the organs will not be damaged before being harvested.
10. **The correct answer is 3.** Palliative care allows patients to make more informed choices, achieve better alleviation of symptoms, and have more opportunity to manage unfinished business.

Chapter 29

1. **The correct answer is 1.** The medulla oblongata controls vital functions necessary for survival, including heart rate, blood pressure, and respiration.
2. **The correct answer is 4.** The general adaptation syndrome is a three-stage reaction to stress. During the alarm reaction, rising hormone levels result in increases in blood volume, blood glucose levels, epinephrine and norepinephrine levels, heart

rate, blood flow to muscles, oxygen intake, and mental alertness.

3. **The correct answer is 3.** Post-traumatic stress disorder (PTSD) can develop after a traumatic injury or event.
4. **The correct answer is 3.** Situational stress can arise from the person's current circumstances, such as moving, changing jobs, and adjusting to a chronic illness or condition.
5. **The correct answer is 2.** The nurse uses the interview to determine the patient's perception of the stressor by asking the patient what is of the most concern at this time.
6. **The correct answer is 4.** Three primary modes of coping with stress are to decrease exposure to stress-producing situations, increase resistance to stress by increasing action-oriented coping strategies, and learn skills that reduce physiological response to stress. A support group can provide information about a wide range of coping strategies, guidance about reducing exposure to stressful situations, and shared training sessions on techniques to reduce physiological responsiveness.
7. **The correct answer is 2.** In the presence of anxiety-provoking thoughts and events, a common physiological symptom is muscle tension. Physiological tension will be diminished through a systematic approach of relaxing major muscle groups.
8. **The correct answer is 4.** Rapid changes in health care technology, diversity in the workforce, organizational restructuring, and changing work systems can place stress on nurses.
9. **The correct answer is 1.** A crisis creates a turning point in a person's life because it changes the direction of a person's life in some way. The precipitating event usually occurs from one to two weeks before the individual seeks help, but it may have occurred within the past 24 hours. In general, a crisis is resolved in some way within approximately six weeks.

Chapter 30

1. **The correct answer is 3.** Bradycardia is a slow heart rate, slower than 60 beats per minute in adults. Bradypnea is an abnormally slow rate of breathing, slower than 12 breaths per minute.
2. **The correct answer is 1.** An inefficient contraction of the heart that fails to transmit a pulse wave to the peripheral pulse site creates a pulse deficit. To assess a pulse deficit, the nurse and a colleague assess radial and apical rates simultaneously and then compare rates. The difference between the apical and radial pulse rates is the pulse deficit.
3. **The correct answer is 1.** The normal temperature range gradually drops as individuals approach older adulthood. Older adults have a narrower range of body temperatures than do younger adults. Oral temperatures of 35°C are not unusual for older adults in cold weather. However, the average body temperature of older adults is approximately 36°C.
4. **The correct answer is 2.** Blood pressure measurements are not accurate unless the blood pressure cuff is the correct size. If the cuff is too small, it tends to become loose if inflated; this results in false high readings.
5. **The correct answer is 3.** Apnea is the cessation of breathing. It may occur during sleep, in which it is most often caused by obstruction from relaxed tissues. With respiratory effort, it can be followed by normal breathing.
6. **The correct answer is 3.** Patients should never alter the prescribed antihypertensive medication unless otherwise directed by their ordering health care provider as this could lead to unstable BP management. It is important, though, to teach patients about measures they can take to modify their diet (e.g., sodium and fat reduction, alcohol limitations) and

reduce stress. Additionally, many will require instruction on how to measure BP at home, acceptable values, and when to notify health care providers when values are out of range.

7. **The correct answer is 1.** The blood pressure measurements indicate that the patient has orthostatic hypotension. If orthostatic hypotension is assessed, the patient is assisted to a supine position, and the physician or nurse in charge is then notified. While obtaining orthostatic measurements, the nurse observes for other symptoms of hypotension, such as fainting, weakness, or light-headedness.
8. **The correct answer is 2.** If the nurse detects an abnormal rate while palpating a radial pulse, the next step is to assess the apical rate. The apical rate requires auscultation of heart sounds, which provides a more accurate assessment of cardiac contraction.
9. **The correct answer is 1.** Conduction is the transfer of heat from one object to another with direct contact. Heat is conducted through contact with solids, liquids, and gases. When the warm skin touches a cooler object, heat is lost. Conduction normally accounts for a small amount of heat loss. The nurse increases conductive heat loss when bathing a patient with a cool cloth.
10. **The correct answer is 3.** Diseases causing poor oxygenation, such as asthma or chronic obstructive pulmonary disease (COPD), cause an increase in pulse rate.
11. **The correct answer is 3.** A reduction in respiratory rate and depth will not reflect inaccuracies in measurement as this is the purpose of obtaining oxygen saturations. Reduced circulation to extremities due to disease or hypothermia can cause poor transmittal of information to the oximeters probe. Bright light near the measuring probe can cause inaccurate readings as the oximeter obtains saturation readings through the measurement of light through a photo detector and if there is too much ambient light, results could be influenced. Covering the measuring site with a blanket while taking the reading would help to improve readings.
12. **The correct answer is 1.** The basic techniques of inspection, palpation, and auscultation are used to measure vital signs.

Chapter 31

1. **The correct answer is 1.** Rationale: Appearance and behaviour are assessed during a general survey. Measurement of vital signs and observing specific body systems are separate components of the physical assessment process and are usually done after the general survey. Conducting a detailed health history usually occurs before the physical examination. Data from the health history guides the physical exam.
2. **The correct answer is 3.** Compared to the fingertips, palmar surface, and base of the hands, the dorsal surface has comparatively less superficial blood supply and less muscle mass. Therefore it remains slightly cooler to touch and so offers a better contrast by which to detect warm skin during physical examination.
3. **The correct answer is 4.** The pads of the index and middle fingertips are the most sensitive part of the hand so the most suitable for palpating lymph nodes, which are usually small and discrete. If deep palpation or excessive pressure is applied, you will miss small nodes and may destroy palpable nodes. Bimanual technique would imply using both hands to examine the same lymph nodes at the same time, whereas when both hands are used to examine lymph nodes (e.g., in the neck), each hand works independently to examine and compare the nodes on opposite sides of the neck.

4. **The correct answer is 3.** Skin lesions that are symmetrical, uniform in colour, and less than 6 mm in diameter are less likely to be dangerous. The warning signs of dangerous skin lesions include asymmetry or irregular borders, more than one colour, changes in size or colour, bleeding, and tenderness. Refer to Table 31-8 to review the descriptions of skin lesions.
5. **The correct answer is 3.** A side-to-side auscultation pattern allows the nurse to compare each lung and determine if adventitious sounds are bilateral or unilateral, which is an important assessment finding that points to potential specific causes of abnormal findings (e.g., COPD would cause bilateral adventitious sounds; pneumothorax would cause unilateral adventitious sounds).
6. **The correct answer is 3.** Rhonchi are loud, low-pitched, rumbling, coarse sounds heard most often during inspiration or expiration. Refer to Table 31-21 for review of each of the breath sounds heard on auscultation.
7. **The correct answer is 3.** S₂ correlates with the closure of the aortic and pulmonic valves. S₁ correlates with the closure of the mitral and tricuspid valves. Refer to Figure 31-36 to review the phases of the cardiac cycle.
8. **The correct answer is 4.** The dorsalis pedis is the pulse point on the dorsal surface of the foot (refer to Figure 31-53). The pulse palpated in the posterior aspect of the knee is the popliteal pulse (refer to Figure 31-52), whereas the pulse palpated in the groove behind the medial malleolus is the posterior tibial pulse (refer to Figure 31-54). There is no pulse point over the lateral malleolus.
9. **The correct answer is 4.** Ipsilateral means on the same side of the body as the breast being examined. The supine position allows the breast tissue to flatten evenly against the chest wall. The patient raises her hand and places it behind the neck to further stretch and position breast tissue evenly (refer to Figure 31-60, A). Place a small pillow or towel under the patient's shoulder blade to further position breast tissue.
10. **The correct answer is 2, 4, 3, 1.** Inspection, auscultation, percussion, palpation. The order of an abdominal examination differs slightly from assessments in the other systems. Begin with inspection and follow with auscultation. By using auscultation before palpation, there is less chance of altering the frequency and character of bowel sounds.
11. **The correct answer is 2.** A painless, pea-sized lump is an abnormal finding that needs to be reported to the patient's health care provider. The testes are normally round, movable, and smooth, rather than lumpy. The nurse should advise the patient to do a testicular self-examination monthly. The best time is after a warm bath or shower when the scrotal skin is less thick.
12. **The correct answer is 4.** Adduction refers to movement of a limb toward the midline of the body, abduction is away from the midline. Refer to Table 31-32 for descriptions of normal range of motion for joints.
13. **The correct answer is 4.** Interpreting abstract ideas or concepts reflects the capacity for abstract thinking. For an individual to explain common phrases such as "A stitch in time saves nine" or "Don't count your chickens before they're hatched" requires a higher level of intellectual function. Note whether the patient's explanations are relevant and concrete. The patient with altered mental status will probably interpret the phrase literally or merely rephrase the words. Judgement requires a comparison and evaluation of facts and ideas to understand their relationships and to form appropriate conclusions. Asking how much the patient knows about his or

her illness or the reason for seeking health care can assess a patient's knowledge. Association involves finding similarities or associations between concepts.

14. **The correct answer is 4.** Cranial nerve XI is the spinal accessory nerve. It provides motor function to move the head and shoulders. Refer to Table 31-37 to review cranial nerve function and assessment.
15. **The correct answer is 3.** Elevated blood pressure is not a normal physical finding in any patient, whereas each of the three other choices is a common variation of normal findings based on the individuals' biocultural background.
16. **The correct answer is 2.** Lithotomy position requires flexion of about 90 degrees and abduction at the hip, which may place stress on the hip joint. The other three choices require only mild flexion at the hip joint and adduction rather than abduction, therefore stress on the joint is minimal.

Chapter 32

1. **The correct answer is 1.** If an infection can be transmitted from one person to another either directly or indirectly, it is a communicable (infectious, contagious) disease.
2. **The correct answer is 1.** Hepatitis A is transmitted by direct and indirect contact. Hepatitis A can be transmitted person to person by the fecal-oral route. It can also be transmitted indirectly via contaminated water or infected food handlers.
3. **The correct answer is 4.** The interval when a patient manifests signs and symptoms specific to the type of infection (e.g., common cold manifested by sore throat, sinus congestion, or rhinitis) is the illness stage.
4. **The correct answer is 2.** Hand hygiene is the most important and most basic technique in preventing the transmission of infections. Hand hygiene includes using an instant alcohol hand antiseptic before and after providing patient care, hand-washing with soap and water when hands are visibly soiled, and performing a surgical scrub when necessary. The components of good handwashing are using an adequate amount of soap, rubbing the hands together to lather the soap and create friction, and rinsing under a stream of water.
5. **The correct answer is 2.** Washing times of at least 15 seconds are needed to remove most transient microorganisms from the skin. If the hands are visibly soiled, more time may be needed.
6. **The correct answer is 2.** Before isolation measures are instituted, the patient must understand the nature of the disease or condition, the purposes of isolation, and the steps for carrying out specific precautions. You also take measures to improve the patient's sensory stimulation during isolation.
7. **The correct answer is 4.** Gowns or cover-ups protect health care workers and visitors from coming in contact with infected material, blood, or body fluid, or contaminated surfaces or objects in the environment.
8. **The correct answer is 2.** Gloves should be removed promptly after use and hand hygiene performed before touching non-contaminated items and environmental surfaces, before moving from a contaminated body site to a clean body site on the same patient, and before going to another patient.
9. **The correct answer is 2.** Contact precautions are needed when standard precautions or routine practices are not sufficient to prevent transmission. *C. difficile* spores have a high potential for environmental contamination and can be spread to other patients via health care workers' hands and contaminated equipment.
10. **The correct answer is 1.** When you are doing a surgical scrub, you must keep your hands above your elbows.

Chapter 33

1. **The correct answer is 1.** Right to refuse has been added to the five rights of medication administration. It is important to remember that a patient has the right to refuse a medication. Ensuring that patients know that they have the right to refuse is important to maintain person-centred care. Patients need to be informed that they have this right, but at the same time, they also need to be fully informed about the potential consequences of their refusal.
2. **The correct answer is 2.** A medication order is required for any medication to be administered. To protect patient safety, you should ensure the medication order contains all the elements (e.g., medication name, dose, route). If the medication order is incomplete, you should inform the prescriber and ensure completeness before carrying out the medication order. Incomplete transcriptions are a source of medication errors.
3. **The correct answer is 1.** The primary contraindications to administering oral medications include the presence of gastrointestinal alterations, the inability of a patient to swallow foods or fluids, the risk of aspiration in patients with impaired ability to swallow, and the use of gastric suction.
4. **The correct answer is 1.** A medication error is any event that could cause or lead to a patient either receiving inappropriate medication therapy or failing to receive appropriate medication therapy. Most medication errors occur when you fail to follow routine procedures, such as checking dose calculations, deciphering illegible handwriting, and recording the names of or administering medications with which you are unfamiliar.
5. **The correct answer is 4.** Apply the following formula for solid dose forms of medications: $\text{Dose ordered} / \text{Dose on hand} \times \text{Amount on hand} = \text{Amount to administer}$
 $500 \text{ mg} / 250 \text{ mg} \times 1 \text{ tablet} = 2 \text{ tablets}$
 Therefore, if the physician orders 500 mg orally (PO) of Keflex and the medication is only available in tablets containing 250 mg, 2 tablets should be administered.
6. **The correct answer is 3.** Subcutaneous injections involve placing medications into the loose connective tissue under the dermis. Because subcutaneous tissue is not as richly supplied with blood as the muscles, absorption is commonly slower than intramuscular injections.
7. **The correct answer is 1.** You are responsible for following legal provisions when administering controlled substances (drugs that alter the mind or behaviour patterns), which can be dispensed only with a prescription. Violations of the *Narcotic Control Act* are punishable by fines, imprisonment, and loss of nurse licensure or registration.
8. **The correct answer is 2.** Pharmacokinetics is the study of how medications enter the body, reach their site of action, are metabolized, and exit the body. Use your knowledge of pharmacokinetics when timing medication administration, judging the patient's risk for alterations in medication action, and observing the patient's response.
9. **The correct answer is 4.** Official publications, such as the *British Pharmacopoeia* and the *Canadian Formulary*, set standards for drug strength, quality, purity, packaging, safety, labelling, and dosage form. Physicians, nurses, and pharmacists depend on these standards to ensure that patients receive pure drugs in safe and effective dosages.
10. **The correct answer is 1.** Administration of the *Food and Drugs Act* and the *Controlled Drugs and Substances Act* is carried out by the Health Protection Branch (HPB) of the federal government. Before a new drug can be marketed in Canada, an

application for approval must be made to the HPB. After intensive testing, the HPB reviews the application. When sufficient information has been accumulated to ensure its safety, the drug is released for general use.

Chapter 34

1. **The correct answer is 3.** Despite the success of allopathic medicine (traditional Western medicine), many health conditions are difficult to treat: for example, arthritis, chronic back pain, gastrointestinal problems, allergies, headaches, and insomnia. Many patients with these health conditions choose to explore alternative methods to relieve their symptoms.
2. **The correct answer is 4.** Many complementary therapies, such as acupuncture, require diagnostic and therapeutic methods specific to their field, whereas other complementary therapies, such as guided imagery and breathwork, are, in general, easily learned and applied.
3. **The correct answer is 1.** One study reported that 74% of Canadians had used some form of CAM in their lifetimes with the purpose of preventing illness and or maintaining wellness.
4. **The correct answer is 1.** Holistic nursing regards and treats the mind, body, and spirit of the patient. Nurses can use holistic interventions such as relaxation therapy, guided imagery, music therapy, simple touch, massage, and prayer. Such interventions affect the whole person (mind-body-spirit) and are economical, noninvasive, nonpharmacological complements to traditional medical care.
5. **The correct answer is 1.** Some complementary and alternative medicine therapies and techniques use natural processes, such as breathing, concentration, and simple touch, to help patients feel better and cope with chronic conditions. You can learn these techniques with minimum preparation, and many of these procedures can be used with patients as part of your independent nursing practice (Dossey et al., 2013). Adequate assessment and the patient's permission are prerequisites for implementing a complementary medicine therapy.
6. **The correct answer is 1.** According to one of the principles of complementary and alternative medicine therapies, the individual must be actively involved in the treatment. Patients achieve better responses if they practise the techniques or exercises daily. The patient must commit to implementing and maintaining the therapy until a desired outcome is achieved.
7. **The correct answer is 3.** St. John's wort is effective as a mild antidepressant and sedative.
8. **The correct answer is 1.** Meditation can augment the effects of certain drugs. For example, individuals taking antihypertensive, antidepressant, or anti-anxiety medications should be monitored. Prolonged practice of meditation techniques may, in some cases, lead to the reduced need for certain medications, and some doses of medications may need to be adjusted.
9. **The correct answer is 2.** Biofeedback techniques are frequently used in addition to relaxation interventions to assist individuals in learning how to control specific autonomic nervous system responses.
10. **The correct answer is 2.** Therapeutic touch is a training-specific therapy that was developed in the 1970s by a nurse, Dr. Dolores Krieger. Although the philosophical and religious assumptions of therapeutic touch differ from those of other Eastern healing modalities, both practices involve trained practitioners who attempt to direct their own balanced energies in an intentional and motivated manner toward the patient.

Chapter 35

1. **The correct answer is 3.** To reduce the risk of injury to you and the patient, you must understand and practise techniques for safe lifting, positioning, and transfer. This includes knowledge of the actions of various muscle groups, understanding the factors involved in the coordination of body movement, and familiarity with the integrated functioning of the skeletal, muscular, and nervous systems, as well as the correct use of lifting and positioning equipment.
2. **The correct answer is 1.** Proprioception is the awareness of the position of the body and its parts. Proprioception is monitored by proprioceptors located on nerve endings in muscles, tendons, and joints. Posture is regulated by the nervous system and requires coordination of proprioception and balance.
3. **The correct answer is 3.** The Canadian Society of Exercise Physiology's 2011 Canadian Physical Activity Guidelines recommend adults get 150 minutes of moderate to vigorous intensity aerobic physical activity per week.
4. **The correct answer is 1.** Older adults may walk more slowly and appear less coordinated. They also may take smaller steps, keeping their feet closer together, which decreases their base of support. Thus, body balance may become unstable, and they are at greater risk for falls and injuries.
5. **The correct answer is 4.** Patients are more open to developing an exercise program if they are at the stage of being ready to change their behaviour. Information on the benefits of regular exercise may be helpful to the patient who has not yet reached the stage of being ready to act.
6. **The correct answer is 2.** It is increasingly clear that children are becoming less active, resulting in an increase in childhood obesity. Children and adolescents spend a great deal of their time in school, yet most Canadian children currently do not receive the recommended five periods of physical activity per week. Physical education has become an optional subject in most secondary schools, and only 18 percent of Canadian teenagers are accumulating enough daily activity to meet the international guidelines for optimal growth and development.
7. **The correct answer is 4.** The nurse has a responsibility to use patient handling equipment that he or she has been trained to use. The nurse must not put himself or herself or allow colleagues or patients to be put at risk of injury. The nurse has an obligation to report any unsafe situations to a supervisor and follow up to ensure resolution for the safety of all.

Chapter 36

1. **The correct answer is 2.** In Canada, accidental injuries are the leading cause of death for individuals between the ages of 1 and 34 years.
2. **The correct answer is 2.** Adolescents are at greatest risk for injury from motor vehicle accidents, suicide, and substance abuse.
3. **The correct answer is 1.** Advancing age and the concurrent physiological changes in vision, hearing, mobility, reflexes, circulation, and the ability to make quick judgements predispose older adults to falls.
4. **The correct answer is 2.** WHMIS consists of three main elements: worker education programs, cautionary labelling of products, and the provision of MSDSs.
5. **The correct answer is 2.** Procedure-related accidents occur during therapy. They include medication and fluid administration errors, the improper application of external devices, and accidents related to the improper performance of procedures (e.g., improper Foley catheter insertion).

6. **The correct answer is 4.** A patient who cannot weight-bear needs to be moved using a mechanical lift, to protect the nurse from injury and in turn maintain the safety of the patient.
7. **The correct answer is 3.** Restraints are *not* considered a long-term intervention. Restraints are used only after other alternatives have been tried, and the least-restrictive method of restraint is used. The use of restraints must be part of the patient's medical treatment. Restraints are considered a short-term intervention; once they have been applied, regular assessments are needed to determine whether they should be continued.
8. **The correct answer is 3.** The poison control centre phone number should be visible on the telephone in homes with young children. In all cases of suspected poisoning, this number should be called immediately, before any intervention.
9. **The correct answer is 4.** Having a family member with the patient at all times is an unrealistic expectation; a trained sitter may be used if constant observation is required. Attending to personal needs, offering diversionary activities, and camouflaging IV lines may help to avoid the need for a restraint.

Chapter 37

1. **The correct answer is 1.** As patients with diabetes often have decreased sensation in their feet, feet should be inspected daily for signs of skin breakdown or infection; changes in colour, temperature, and sensation; and any discoloration or thickening of toenails. Daily inspection can help decrease the development of foot ulcers and subsequent complications.
2. **The correct answer is 3.** Psoriasis is a chronic inflammatory skin condition, the exact cause of which is unknown, and there is currently no cure. It is thought to be an immune-mediated disease whereby the person's immune system reacts against its own cells. It is not contagious and cannot be passed from one person to another. It is not related to poor hygiene.
3. **The correct answer is 3.** With her chronic disease, she may have decreased sensation and circulation, and an increased healing time. She is at a higher risk of developing infection and foot ulcers, which are difficult to treat and slow to heal.
4. **The correct answer is 2.** The skin holds information about the body's circulation, nutritional status, and signs of systemic disease.
5. **The correct answer is 3.** Pallor in a patient with dark skin appears ashen, grey, or dull.
6. **The correct answer is 2.** Inflammation is not easily recognized, and it is often necessary to palpate the skin for increased warmth, taut surfaces that may indicate edema, and induration (hardening of the tissue) as redness at the site of the inflammation is not able to be seen in a dark-skinned patient.
7. **The correct answer is 1.** Gag reflex should be tested in order to avoid aspiration of oral contents during oral hygiene care.
8. **The correct answer is 1.** The patient should always be included in the care plan. Cultural preferences should always be considered. If the patient is unconscious, the family can provide information on hair care preferences.
9. **The correct answer is 2.** This action prevents secretions from entering the nasolacrimal duct.
10. **The correct answer is 4.** It is important to do all these actions.

Chapter 38

1. **The correct answer is 1.** Anemia, a lower than normal hemoglobin level, is a result of decreased hemoglobin production, increased red blood cell destruction, blood loss, or a combination of these factors. Patients will have complaints of fatigue,

decreased activity tolerance, and increased breathlessness, as well as pallor (especially seen in the conjunctiva of the eye) and an increased heart rate.

2. **The correct answer is 2.** Carbon monoxide is the most common toxic inhalant that decreases the oxygen-carrying capacity of blood. The affinity for hemoglobin to bind with carbon monoxide is greater than 200 times its affinity to bind with oxygen, creating a functional anemia. Because of the bond's strength, carbon monoxide is not easily dissociated from hemoglobin, making the hemoglobin unavailable for oxygen transport.
3. **The correct answer is 1.** Hypovolemia is caused by conditions such as shock and severe dehydration resulting from extracellular fluid loss and reduced circulating blood volume. With a significant fluid loss, the body tries to adapt by increasing the heart rate and peripheral vasoconstriction to increase the volume of blood returned to the heart and, in turn, increase the cardiac output.
4. **The correct answer is 3.** Fever increases the tissues' need for oxygen, and as a result, carbon dioxide production also increases. If the febrile state persists, the metabolic rate remains high and the body begins to break down protein stores, resulting in muscle wasting and decreased muscle mass. Respiratory muscles such as the diaphragm and intercostal muscles are also wasted.
5. **The correct answer is 1.** Left-sided heart failure is an abnormal condition characterized by impaired functioning of the left ventricle as a result of elevated pressures and pulmonary congestion. If left ventricular failure is significant, the amount of blood ejected from the left ventricle drops greatly, resulting in decreased cardiac output.
6. **The correct answer is 1.** Right-sided heart failure results from impaired functioning of the right ventricle characterized by venous congestion in the systemic circulation. Right-sided heart failure more commonly results from pulmonary disease or is a consequence of long-term left-sided failure. Right-sided heart failure results from impaired functioning of the right ventricle, characterized by venous congestion in the systemic circulation. Right-sided heart failure more commonly results from pulmonary disease or from long-term left-sided failure. As the failure continues, the amount of blood ejected from the right ventricle declines, and blood begins to "back up" in the systemic circulation. Clinically, the patient has weight gain, distended neck veins, hepatomegaly and splenomegaly, and dependent peripheral edema.
7. **The correct answer is 2.** Cyanosis, blue discoloration of the skin and mucous membranes caused by the presence of desaturated hemoglobin in capillaries, is a late sign of hypoxia. The presence or absence of cyanosis is not a reliable measure of oxygenation status.
8. **The correct answer is 1.** A person who starts smoking in adolescence and continues to smoke into middle age has an increased risk for cardiopulmonary disease and lung cancer.
9. **The correct answer is 3.** Frequent changes of position are simple and cost-effective methods for reducing the risks of stasis of pulmonary secretions and decreased chest wall expansion.
10. **The correct answer is 4.** The most effective position for patients with cardiopulmonary diseases is the 45-degree semi-Fowler's position, using gravity to assist in lung expansion and reduce pressure from the abdomen on the diaphragm.
11. **The correct answer is 1.** If an unexpected outcome resulting from a chest tube is a tension pneumothorax, it is important

to determine if the cause is related to the chest tube being clamped, kinked, or occluded.

12. **The correct answer is 4.** Applying intermittent suction while withdrawing the catheter prevents injury to tracheal mucosal lining.

Chapter 39

1. **The correct answer is 1.** Hypokalemia is one of the most common electrolyte imbalances, in which an inadequate amount of potassium circulates in extracellular fluid (ECF). When severe, hypokalemia can affect cardiac conduction and function. Because the normal amount of serum potassium is so small, fluctuations are poorly tolerated. The most common cause of hypokalemia is the use of potassium-wasting diuretics such as thiazide and loop diuretics.
2. **The correct answer is 4.** An infant's proportion of total body water (70% to 80% total body weight) is greater than that of children or adults. Infants are not protected from fluid loss because they ingest and excrete a relatively greater daily water volume than do adults. Therefore, they are at a greater risk for FVD and hyperosmolar imbalance because body water loss is proportionately greater per kilogram of weight. In addition, infants are dependent on others for fluid intake.
3. **The correct answer is 2.** Older adults experience a number of age-related changes that can affect fluid, electrolyte, and acid-base balances. They have a decreased thirst sensation, which may affect their oral intake of fluids. The kidneys have a decrease in the glomerular filtration rate and in the number of filtering nephrons. These changes can mean that in the presence of sodium depletion or overload, the older adult may be unable to maintain homeostasis, and the imbalance is instead worsened.
4. **The correct answer is 4.** For patients in health care settings, measurement of intake and output is a nursing intervention routinely used for patients following a procedure, patients who are febrile, patients with restricted fluids, or patients who receive diuretic or intravenous therapy. Output includes urine, diarrhea, vomitus, gastric suction, and drainage from postsurgical wounds or other tubes.
5. **The correct answer is 1.** Health promotion activities in the area of fluid, electrolyte, and acid-base imbalances focus primarily on patient teaching. Patients and caregivers need to recognize risk factors for these imbalances and implement appropriate preventive measures.
6. **The correct answer is 1.** Under no circumstances should potassium chloride (KCl) be given by intravenous push. A direct intravenous infusion of KCl can be fatal. If an intravenous fluid is to have additives, a physician's order must be obtained that includes the required additives.
7. **The correct answer is 1.** The patient's microflora and contamination by insertion are initially controlled for in the procedure for intravenous insertion. However, the other factors are controlled through conscientious use of infection control principles. This begins with thorough hand hygiene before and after the nurse handles any component of the intravenous system.
8. **The correct answer is 3.** An infiltration occurs when intravenous fluids enter the surrounding space around the venipuncture site. This is manifested as swelling (from increased tissue fluid) and pallor and coolness (caused by decreased circulation) around the venipuncture site.
9. **The correct answer is 3.** Although many policies recommend replacing PVAD and rotating sites to prevent phlebitis, the most recent evidence-informed review suggests that this is

unnecessary, is costly and may increase patient discomfort unnecessarily; therefore, current recommendations are to rotate sites based on clinical indications, including painful site, redness, swelling, or hardness at the site.

10. **The correct answer is 4.** Although tachycardia and possibly some dyspnea with acute hemolytic and anaphylactic reactions will occur, the most common symptoms of circulatory overload related to blood administration are cough, dyspnea, and tachycardia. In other reactions, fever, chills, or both also occur.

Chapter 40

1. **The correct answer is 4.** Excessive daytime sleepiness (EDS) is the most common complaint of people with obstructive sleep apnea (OSA). People with severe OSA may report experiencing a disruption in their daily activities because of sleepiness.
2. **The correct answer is 2.** In hospitals and long-term care facilities, patients may have difficulty finding the time they need to rest and sleep. You should plan care to avoid awakening patients for nonessential tasks. You should schedule assessments, treatments, procedures, and routines for times when patients are awake. For example, you should not wake a stable patient to check vital signs.
3. **The correct answer is 4.** The use of nonprescription sleeping medications is not advisable. Patients should learn the risks of such drugs. Over the long term, these drugs can lead to further sleep disruption even when they initially seemed to be effective. Older adults should be cautioned about using over-the-counter antihistamines because of their long duration of action that can cause confusion, constipation, urinary retention, and increased risk of falls.
4. **The correct answer is 4.** Patients should be cautioned about the dosage and use of herbal compounds because active ingredients can vary from product to product. Herbal compounds may interact with prescribed medication, and concurrent use should be avoided.
5. **The correct answer is 1.** Although dreams occur during both nonrapid eye movement (NREM) and rapid eye movement (REM) sleep, the dreams of REM sleep are more vivid and elaborate and are believed to be functionally important to learning, memory processing, and adaptation to stress.
6. **The correct answer is 3.** Alcohol can initially make a person feel drowsy; however, it can also cause a person to awaken during the night and can cause difficulty returning to sleep.
7. **The correct answer is 1.** Limiting alcohol, caffeine, and nicotine and decreasing fluids two to four hours before sleep may promote sleep for older adults.
8. **The correct answer is 3.** The Canadian Paediatric Society recommends that apparently healthy infants be placed in the supine position during sleep because of an association between the prone position and the occurrence of sudden infant death syndrome (SIDS).
9. **The correct answer is 4.** Narcolepsy is a dysfunction of mechanisms that regulate the sleep and wake states. Excessive daytime sleepiness (EDS) is the most common complaint associated with this disorder. Brief daytime naps no longer than 20 minutes help reduce subjective feelings of sleepiness. During the day, the person may suddenly feel an overwhelming wave of sleepiness and fall asleep; REM sleep can occur within 15 minutes of falling asleep.
10. **The correct answer is 4.** Sleep needed during the school years is individualized because of varying activity and health levels.

Six-year-olds average 11 to 12 hours of sleep nightly, whereas 11-year-olds sleep 9 to 10 hours. Six- or seven-year-olds can usually be persuaded to go to bed by encouraging quiet activities.

Chapter 41

1. **The correct answer is 3.** Imagery is a visualization technique used by the patient to decrease pain sensation by focusing on pleasurable images. Distraction (2) involves directing the patient's attention to something within the immediate environment to reduce pain awareness. Relaxation exercises (4) involve techniques that lessen physical and mental tension through focus on consciously releasing muscle tension. Recall (1) is not a nonpharmacological pain strategy.
2. **The correct answer is 4.** Referred pain is perceived in an area distant from its point of origin. Transient pain (1) is brief and passes quickly and may be at its point of origin. Superficial pain (2) originates in the skin or subcutaneous tissue. Phantom pain (3) may reflect injury to the peripheral nervous system and may occur in a person who has lost part of a limb.
3. **The correct answer is 3.** The Northern Pain Scale is a self-report scale for developmentally age-appropriate young Inuit children experiencing acute pain episodes. The FLACC tool (1) is most appropriate for children who are nonverbal. The Numerical Rating Scale is indicated for children (>9 years) and adults experiencing acute pain who are able to use numbers to rate the intensity of their pain. The Wong-Baker Scale (4), although a self-report scale specific for this age group, is not as culturally appropriate.
4. **The correct answer is 3.** Increased blood pressure is an involuntary sympathetic nervous system response to moderate pain. Heart rate (2) would increase due to the activation of the sympathetic nervous system. Restlessness (1) and protection of the painful area (4) are behavioural responses.
5. **The correct answer is 4.** You can only make an accurate diagnosis of pain after you have performed a complete patient assessment. You will consider the patient's withdrawal from communication, grimacing, moaning, and verbalizations of discomfort.
6. **The correct answer is 3.** Descriptive scales are used both to assess pain severity and to evaluate changes in a patient's condition. A rating of 7 or more on a 0 to 10 scale requires immediate attention. The dose was insufficient.
7. **The correct answer is 3.** Teaching patients about pain reduces anxiety and helps them to achieve a sense of control. When a patient is anticipating pain, you need to explain procedures and any associated discomfort. A confident explanation of the procedure helps you to gain a patient's trust. When patients are informed about an upcoming painful experience, they often perceive the actual experience as less unpleasant.
8. **The correct answer is 4.** Relaxation and guided imagery are examples of mind-body interactions to decrease pain sensation, whereas physical interventions (2) are techniques that focus solely on the body. Adjuvants are drugs used to enhance the effect of opioids (1), whereas patient-controlled analgesia (3) is a drug delivery system.
9. **The correct answer is 3.** One way to maximize pain relief while minimizing drug toxicity is to administer medication on a regular around-the-clock (ATC) basis rather than on an as-needed (prn) basis. The Canadian Pain Society has stated that if pain is anticipated for the majority of the day, ATC administration should be considered to prevent breakthrough pain, which is hard to control once it appears.

10. **The correct answer is 2.** A drug delivery where the patient, not the nurse (1) or family (3), is in control of the delivery of pain management program. Although the patient may use less medication because it is self-administered before the pain becomes too severe, the primary goal of this delivery system is not to minimize the quantity of analgesia needed to control pain (4).

Chapter 42

1. **The correct answer is 3.** Carbohydrates are the main source of energy in the diet.
2. **The correct answer is 2.** Essential nutrients are generally supplied by food.
3. **The correct answer is 4.** When the intake of nitrogen exceeds the output, the body is in positive nitrogen balance, which is required for growth, normal pregnancy, maintenance of lean muscle mass and vital organs, and wound healing.
4. **The correct answer is 2.** Income as the major determinant is positively correlated with food selection and quantity.
5. **The correct answer is 1.** When a patient is unable to take fluid or food by eating normally over an extended period of time, nutrients are needed, and giving liquid nutrients through a nasoenteral feeding tube will ensure adequate nutrition.
6. **The correct answer is 4.** The nutrient content claim *light* is permitted only on foods reduced in fat or reduced in calories. The percent of reduction in calories or fat has not been established for the claim *light*.
7. **The correct answer is 4.** Whole milk helps ensure adequate intake of fatty acids necessary for brain and neurological development.
8. **The correct answer is 3.** The stronger side can do the work of chewing and swallowing.
9. **The correct answer is 3.** Age-related factors affect appetite, comfort, and digestion of food.
10. **The correct answer is 2.** Filling the tube with water and clamping it after each feeding will *most* likely prevent clogging of a nasogastric feeding tube.

Chapter 43

1. **The correct answer is 2.** The normal adult urine output is 1500 to 1600 mL/day.
2. **The correct answer is 1.** Renal alterations result from factors that cause injury directly to the glomeruli or renal tubule, interfering with their normal filtering, reabsorptive, and secretory functions. Selected causes are transfusion reactions, diseases of the glomeruli, and systemic diseases such as diabetes mellitus.
3. **The correct answer is 2.** Postrenal alterations result from obstruction to the flow of urine in the urinary collecting system anywhere between the renal pelvis and the urethral meatus. Urine is formed by the urinary system but cannot be eliminated by normal means. Urinary obstruction can be caused by calculi (stones), blood clots, or tumours.
4. **The correct answer is 3.** The urine is normally acidic, which inhibits bacterial growth and may prevent UTIs. Residual urine left in the bladder becomes alkaline and is an ideal medium for microbial growth.
5. **The correct answer is 3.** Hospital-acquired UTIs are often related to poor hand hygiene and urinary catheterization. The introduction of a catheter through the urethra provides a direct route for microorganisms to enter the bladder.
6. **The correct answer is 1.** The urine appears concentrated and cloudy because of the presence of white blood cells (WBCs) or bacteria.

7. **The correct answer is 1.** Prompted voiding is a useful strategy for patients with cognitive and/or physical impairment who rely on caregiver assistance.
8. **The correct answer is 3.** With stress incontinence, urine loss results from increased intra-abdominal pressure (e.g., coughing, sneezing, laughing, lifting). It usually involves a small volume of urine loss (less than 50 mL) and usually occurs in women or in men following radical prostatectomy. Pregnancy and delivery, weak pelvic floor muscles, heavy lifting, and obesity are sometimes contributing factors.
9. **The correct answer is 1.** The drainage bag should never be raised above the level of the patient's bladder. It should hang on the bed frame or wheelchair without touching the floor. Urine in the bag and tubing can become a medium for bacteria, and infection is likely to develop if urine flows back into the bladder.
10. **The correct answer is 4.** Care must be taken to ensure that whatever type or size of condom is used, blood supply to the penis is not impaired. Therefore, the condom catheter should be snug and secure but should not cause constriction of blood flow.
11. **The correct answer is 3.** In many cases, incontinence can be improved through careful assessment, determination of possible causes and contributors, and implementation of management strategies. Referral to a local continence service that can provide this expertise and reliable web-based resources can be a source of information for the patient.
12. **The correct answer is 2.** Research has demonstrated that weight loss in the overweight individual can be an effective strategy in improving incontinence, particularly in women with stress incontinence.

Chapter 44

1. **The correct answer is 4.** Most nutrients and electrolytes are absorbed in the small intestine, specifically in the duodenum and jejunum.
2. **The correct answer is 3.** Lactose intolerance is the inability to digest lactose, which is the predominant sugar in milk and milk products. Lactose intolerance is caused by a shortage of the enzyme lactase. Lactase is normally produced by the cells that line the small intestine and is needed to digest lactose; however, lactase is genetically programmed to disappear in adulthood in everyone except in individuals of northern European ancestry. As a result, many adults cannot digest lactose, which results in diarrhea, gaseous distension, and cramping.
3. **The correct answer is 4.** Fecal occult blood testing (FOBT), or the guaiac test, is a common laboratory test that can be done at home or at the patient's bedside. This test measures microscopic amounts of blood in the feces. FOBT is useful as a diagnostic screening test for colon cancer.
4. **The correct answer is 1.** Antidiarrheal opiate agents decrease intestinal muscle tone to slow the passage of feces. Opiates inhibit the peristaltic waves that move feces forward but they also increase segmental contractions that mix the intestinal contents and expose them to the mucosal-absorbing surface.
5. **The correct answer is 3.** An obvious sign of impaction is the inability to pass a stool for several days, despite the repeated urge to defecate. When a continuous oozing of diarrhea stool develops, impaction should be suspected. The diarrhea is the result of the liquid portion of feces, located higher in the colon, seeping around the impacted mass.
6. **The correct answer is 4.** Cleansing enemas promote the complete evacuation of feces from the colon. The amount of solution to be instilled in an adult is 750 to 1000 mL.

7. **The correct answer is 3.** The specific signs and symptoms of intolerance to an enema include abdominal pain that is greater than a pressure sensation, abdominal cramping, abdominal distension, or rectal bleeding. The enema must be stopped. Notify the physician and obtain vital signs.
8. **The correct answer is 2.** One of the greatest problems in caring for a patient with a nasogastric tube is maintaining comfort. The tube is a constant irritation to nasal mucosa. The nurse must assess the condition of both nares and mucosa for inflammation and excoriation.
9. **The correct answer is 1.** The stool discharged from an ostomy is called *effluent*.
10. **The correct answer is 1.** A nurse trained to care for ostomy patients is an enterostomal therapist (ET).

Chapter 45

1. **The correct answer is 2.** Footdrop is the inability to dorsiflex and invert the foot because of peroneal nerve damage. The foot is permanently fixed in plantar flexion and the person is therefore unable to lift the toes off the ground.
2. **The correct answer is 3.** The effects of bed rest or immobilization on the muscular system include reduced muscle mass, muscle weakness, and muscle atrophy.
3. **The correct answer is 1.** After bed rest, patients usually have increased pulse rate and decreased pulse pressure and blood pressure. A large decrease in blood pressure when arising to a sitting or standing position (a drop of 20 mm Hg or more in systolic blood pressure and of 10 mm Hg in diastolic blood pressure) is known as orthostatic hypotension and can result in light-headedness and fainting.
4. **The correct answer is 3.** Elastic stockings (sometimes called thromboembolic device hose, or TED) help to maintain external pressure on the muscles of the lower extremities and thus may promote venous return.
5. **The correct answer is 3.** Immobility can have a significant effect on the older adult's levels of health, independence, and functional status.
6. **The correct answer is 4.** Increased activity may result in symptoms associated with activity intolerance (e.g., increased pulse, changes in blood pressure, increased respirations, and decreased level of comfort). This can jeopardize the patient's safety.
7. **The correct answer is 1.** The trapeze bar is a triangular device that descends from a securely fastened overhead bar attached to the bed frame. It allows the patient to use the upper extremities to raise the trunk off the bed, to assist in transfer from the bed to a wheelchair, or to perform upper arm exercises.
8. **The correct answer is 2.** The patient in the prone position is lying face or chest down.
9. **The correct answer is 3.** When a patient is in supported Fowler's position, placement of a small pillow or roll under the thigh prevents occlusion of the popliteal artery from pressure from body weight. It also prevents hyperextension of the knee.
10. **The correct answer is 4.** The body requires additional energy to heal pressure ulcers. Dietitians are trained in thorough assessment of caloric requirements and intake for effective wound healing and, thus, are essential members of the health care team looking after patients with skin breakdown. In addition, dietitians are knowledgeable about different sources of nutrition, including supplements or tube feeding, if required.

Chapter 46

1. **The correct answer is 4.** When the skin is being compressed, blood flow is slowed and the skin becomes pale. After the pressure is relieved, the skin in the affected area turns red (erythema), which is a result of the blood vessels expanding (vasodilation) to allow more blood into the area to overcome the ischemic episode. This process is called *normal reactive hyperemia*. Assess the reddened area by pressing a fingertip over it. If the area blanches (turns white or a pale colour) and the erythema returns when the finger is removed, the reactive hyperemia is likely transient. If, however, the reddened area

does not blanch when finger pressure is applied (abnormal reactive hyperemia), suspect deep tissue damage.

2. **The correct answer is 1.** A stage I pressure ulcer is an observable pressure-related alteration of intact skin, whose indicators, as compared with an adjacent or opposite area on the body, may include changes in skin temperature (warmth or coolness), tissue consistency (firm or beefy feel), and sensation (pain or itching).
3. **The correct answer is 4.** If purulent or suspicious-looking wound drainage is present or there is a change in a previously healing chronic wound, obtaining a specimen of the drainage for culture may be necessary. The wound culture sample should never be collected from old drainage. Resident colonies of bacteria from the skin grow within exudate and may not be the true causative organisms of a wound infection. Before culturing a wound, clean the base of the wound with normal saline to remove superficial slough and debris. Select the cleanest part of the wound bed (granulating tissue is optimal), press the swab into a 1-cm square area of this cleanest part of the wound, and rotate fully, pressing to express fluid beneath the surface of the wound bed.
4. **The correct answer is 3.** When evisceration occurs, place sterile towels soaked in sterile saline over the extruding tissues to reduce chances of bacterial invasion and drying of the tissues. If the organs protrude through the wound, blood supply to the tissues is compromised. The patient should be allowed nothing by mouth (NPO), observed for signs and symptoms of shock, and prepared for emergency surgery.
5. **The correct answer is 3.** Serous drainage is clear, watery plasma.
6. **The correct answer is 3.** Ensuring the patient understands the plan of care will decrease anxiety and increase the patient's feeling of control. Pain can also have a negative impact on wound healing; thus, assessing the need for analgesia and providing it before the dressing change supports optimal healing and patient comfort and control.
7. **The correct answer is 3.** Exposure to fecal and urinary incontinence creates a caustic environment on the skin that leads to excoriation and further breakdown, once the skin is no longer intact. An incontinence cleanser and a moisture barrier ointment will remove urine and feces from the skin, leaving a protective (usually silicone-based) barrier that repels moisture.
8. **The correct answer is 4.** Hydrocolloid dressings are dressings with complex formulations of colloidal, elastomeric, and adhesive components that are both adhesive and occlusive. The wound contact layer of this dressing forms a gel as fluid is absorbed and maintains a moist healing environment.
9. **The correct answer is 3.** An abdominal binder will support the wound and reduce stress on large abdominal incisions that are vulnerable to tension or stress as the patient moves or coughs.
10. **The correct answer is 4.** The body requires additional energy to heal pressure ulcers. Dietitians are trained in thorough assessment of caloric requirements and intake for effective wound healing and, thus, are essential members of the health care team looking after patients with skin breakdown. In addition, dietitians are knowledgeable about different sources of nutrition, including supplements or tube feeding, if required.

Chapter 47

1. **The correct answer is 2.** A kinesthetic sense enables a person to be aware of the position and movement of body parts without seeing them.

2. **The correct answer is 1.** Stereognosis is a sense that allows a person to recognize an object's size, shape, and texture.
3. **The correct answer is 3.** When a person receives multiple sensory stimuli and cannot perceptually disregard or selectively ignore some stimuli, sensory overload occurs. The patient in constant pain or who undergoes frequent monitoring of vital signs is at risk. Multiple stimuli can combine to cause overload.
4. **The correct answer is 2.** Proprioceptive changes after the age of 60 years include increased difficulty with balance, spatial orientation, and coordination.
5. **The correct answer is 4.** For a patient with hearing impairment, you should face the patient when speaking, use simple sentences, and speak more slowly and at a normal volume.
6. **The correct answer is 4.** The nursing health history includes assessment of the nature and characteristics of sensory alterations or any problem related to an alteration. The nurse begins by asking the patient to describe the sensory deficit. For example, "How does your hearing now compare with your hearing a year ago?"
7. **The correct answer is 2.** Advise older adults as follows: Do not drive during rush hour. Use rear-view and side-view mirrors when changing lanes. Avoid driving at dusk or at night. Drive slowly, but not too slowly. Keep your car in good working condition.
8. **The correct answer is 3.** Hearing loss caused by noisy environments was once thought to affect primarily older individuals; however, recent research has observed this loss in youth. As a nurse, you should routinely teach parents and children to take precautions when involved in activities associated with high-intensity noise. You should assess patients for noise exposure and participate in providing hearing conservation classes for teachers, students, and patients.
9. **The correct answer is 3.** Olfaction is the sense of smell. A patient who cannot smell smoke may not know that something is burning. A smoke detector would be essential.
10. **The correct answer is 1.** When senses are impaired, the sense of self is impaired. Initially, a person may withdraw by avoiding communication or socialization with others in an attempt to cope with the sensory loss.
2. **The correct answer is 3.** If a patient regularly uses prescription or over-the-counter medications, the surgeon or anesthesiologist may temporarily discontinue the drugs before surgery or adjust the dosages. Certain medications have special implications for the surgical patient, creating greater risks for complications or interacting negatively with anesthetic agents.
3. **The correct answer is 2.** The patient who smokes is at greater risk for postoperative pulmonary complications than a patient who does not.
4. **The correct answer is 2.** The family is an important resource for a patient with physical limitations and provides the emotional support needed to motivate the patient to return to a previous state of health. Often, a family member can become the patient's coach, offering valuable support during the postoperative period.
5. **The correct answer is 1.** Accurate recording of intake and output helps assess renal and circulatory function. For example, you measure all sources of output, including urine, surgically placed drains, gastric drainage, and drainage from wounds, and note any insensible loss from diaphoresis.
6. **The correct answer is 3.** Position the patient on one side with the face downward and the neck slightly extended to facilitate a forward movement of the tongue and the flow of mucous secretions out of the mouth.
7. **The correct answer is 4.** To promote normal venous return and circulatory blood flow, encourage patients to perform leg exercises at least every hour while awake. Other measures include applying elastic stockings or sequential compression device as ordered, encouraging early ambulation, positioning the patient so that blood flow is not interrupted, administering anticoagulant drugs as ordered, and promoting adequate fluid intake.
8. **The correct answer is 2.** International normalized ratio (INR) and activated partial thromboplastin time (APTT) indicate the clotting ability of blood, which if greater than normal reveal patients at risk for bleeding tendencies.
9. **The correct answer is 2.** Maintaining an upright position facilitates diaphragm excursion and enhances expansion of the thorax.
10. **The correct answer is 4.** Malignant hyperthermia is a potentially lethal condition that can occur in patients who received general anaesthesia. It should be suspected when there is unexpected tachycardia and tachypnea; jaw muscle rigidity; body rigidity of limbs, abdomen, and chest; or hyperkalemia. Temperature elevation is a late sign.

Chapter 48

1. **The correct answer is 2.** The obese patient is susceptible to poor wound healing and to wound infection because of the structure of fatty tissue, which contains a poor blood supply. This slows delivery of essential nutrients and enzymes needed for wound healing.

- A**
- Abandonment**
fears of dying patients, 465
and social isolation in older adults, 385, 437b
- Abbreviations**
and accuracy in charting, 206–207
Canadian Système Internationale
d'Unités (SI units) (See Appendix B)
errors, 206–207, 676, 676t
medication dosage, 669t
- ABCD mnemonic**
for skin cancer detection, 556b
- ABCDE mnemonic**
for pain assessment and management, 1027b
- ABCs of Engaging Families**, 285t
- Abdomen**
distension, 540, 1167, 1173b, 1362, 1364t–1365t
movement during breathing, 513–514, 514f
palpation of, 540, 597, 597f, 1167
physical assessment/examination of, 594–597, 595f, 595t, 596b, 597f, 1167, 1167t, 1173b
preoperative assessment of, 1336
quadrants and organs of, 595f, 1167
- Abdominal binders**, 1294, 1295b–1296b
- Abdominal gas**, 1362, 1366–1367
- Abdominal roentgenograms**, 1129t–1130t
- Abduction**, 1203, 1204t–1208t
- ABO system**, 985–986, 986t
- Aboriginal Diabetes Initiative (ADI)**, 120–121
- Aboriginal peoples**
Aboriginal Health Human Resources Initiative (AHHRI), 27
adolescents, 359
biocultural ecology, 120–121
caring beliefs and practices, 122
circle of life beliefs, 121–122, 310b, 312f
cultural assessment of, 119–123
culturally competent health care for, 16–19, 119–123, 122b
demographic and population statistics, 109–110, 119–123
developmental beliefs of, 310b, 312f
early health care practices/conditions, 30–32, 34, 119–120
Eating Well with Canada's Food Guide for, 1056–1058, 1057f, 1058t
ethnohistory of, 119–120
family characteristics, 275
First Nations and Inuit Health Branch (FNIHB), 239
groups, subgroups, and identifying names of, 119
health risks
alcohol and substance abuse, 121
diabetes mellitus, 120–121, 1051
HIV/AIDS, 121, 122b
hypertension, 522
obesity, 1051
suicide, 121
violence against women, 121, 121b
holistic and traditional Aboriginal medicine, 121–122, 243, 310b, 312f, 753b, 753t–755t
inequities and social injustices, 47–49, 119–120, 123
language and communication, 121
medicine wheel, 121–122, 310b, 312f
older adult population, 375
primary health care (PHC) for, 18–19, 120–123
religious and spiritual practices, 121–122
self-governance, 18–19
social and family organizations, 120
socioeconomic status, 120
traditional Aboriginal medicine, 121–122, 243, 310b, 312f, 753t–755t
as vulnerable population, 45, 47–49, 48b, 120–121
- Abortion**, 102, 421
- Abrasions**, 830t, 1268
- Absorption**
aging effects on medication, 688–690, 690b, 691f
- Absorption (Continued)**
nutrient and water, 1055
in pharmacokinetics, 666
- Abstract**, 68
- Abuse**
child, 47–48, 104–105, 423–424, 423b
elder, 47–48, 385, 386b, 547b–548b, 548
and neglect of infants, 333, 336b
red flags, 547b–548b
sexual, 47–48, 121, 336, 336b, 423–424, 423b, 426
substance (See substance abuse)
using drugs or alcohol to cope with, 406–407
vulnerable populations, 45, 47–49, 48b
- Acceptance stage of grief**, 449–450, 449t
- ACCESS model**, 112
- Accessibility to health care**
in global, international and public health care, 108t
as pillar of primary health care (PHC), 22b
as principle of *Canadian Health Act* of 1984, 17–18, 18t
- Accidents; See also falls**
infants, 333, 334b–335b
preschoolers, 344–345
procedure-related medical, 795, 796b
risks and safety, 791–792
school-age children, 350t
toddlers and preschoolers, 340–341, 342t–343t
- Accommodation**, 313
- Accountability**
regarding adverse events, 90–91
competency in nursing, 131f, 132
as ethical responsibility of nurses, 82b–83b, 83
- Acculturation**
definition of, 111
immigrant age and, 116
- Accuracy**
in charting, 206–207
and truthful documentation, 98b, 99
- Acetone**, 1055, 1388t–1389t, 1396t–1398t
- Achieving Health for All: A Framework for Health Promotion**, 4, 5f
- Acid-base balance; See also fluid, electrolyte, and acid-base balances**
arterial blood gas (ABG) analysis to measure, 942–945, 946t
types of imbalances
diabetic ketoacidosis, 945, 946t
metabolic acidosis, 945, 946t, 951t–952t, 954b
metabolic alkalosis, 945, 946t, 949, 951t–952t, 954b
respiratory acidosis, 945, 946t, 949, 951t–952t, 954b
respiratory alkalosis, 945, 946t, 951t–952t, 954b
urinalysis to measure pH, 1128t, 1396t–1398t
- Acne**, 830t, 833
- Acromegaly**, 558–559
- Active listening**, 254, 256b, 269, 404b, 444b
- Active transport**, 938, 939f
- Activities of daily living (ADLs)**
aging and, 381t, 382, 389, 393
definition of, 189
functional assessment of, 282–284
immobility, 778–779, 1196–1198, 1231
in older adults, 375–376, 380–382
osteoporosis and, 1200, 1200b
pain and, 1032, 1032b
proprioceptors and balance influencing, 773
sensory losses and, 1321–1322
- Activity and exercise; See exercise and physical activity**
- Activity theory**, 376–377
- Activity tolerance**, 1209–1210, 1240b
influences and adaptations, 774–775, 779b, 781f
nursing process application to assessment, 777–779, 778f, 779b–780b
evaluation, 787, 788f
implementation, 781–787, 782b–784b, 786b, 786f
nursing diagnosis, 779, 780b
planning, 779–781, 780f–781f, 782b–783b
- Actual losses**, 448, 448t
- Actualization and stability concept**, 2–3
- Acuity levels of sickness**, 1372
- Acupoints**, 762, 1037
- Acupressure**, 753t–755t
- Acupuncture**, 753t–755t, 762, 762f, 1037
- Acute care**
delirium, 392
fluid, electrolyte, and acid-base imbalances, 958–987, 1350
immobility hazards in, 1216–1246
malnutrition, 392, 1063b
noise, 1320–1321
nosocomial infections, 392
older adults, 392–393
self-concept issues during, 411–412, 412b
sensory deficits, 392
sensory stimuli, 1320–1321
- Acute coronary syndrome (ACS)**, 886–887
- Acute myocardial infarction (AMI)**, 879
- Acute pain**
description and classification of, 1021, 1028–1030, 1030f
management (See pain management)
- Acute spinal cord injury**, 1215, 1216f
- Acute stress disorder**, 477
- Adam, Evelyn**, 59b, 61
- Adaptation**, 472–473
- Addictions; See also alcohol abuse; drug abuse; substance abuse**
and access to care, 22b
CAGE substance abuse questionnaire, 548
to opioids, 1046b
vulnerable populations, 45, 47–49, 48b
- Adduction**, 1203, 1204t–1208t
- Adjuvants**, 1040
- Admission forms**, 210t, 213
- Adolescence/adolescents**
Aboriginal, 359
age period defining, 327b
cognitive skill development, 353t–354t, 354–355
coping patterns, 346t–347t, 348–349
developmental behaviours, 346t–347t
diversional activities, 345, 346t–347t
eating disorders, 357, 1061
exercise recommendations for, 784b
fears, 328–329, 346t–347t, 348–349
gay, lesbian, and bisexual, 359
growth and development stages, 352, 353t–354t
health promotion topics, 356–359, 358t
health risks/concerns
anorexia nervosa and bulimia, 357, 1061, 1063t
hearing loss, 792, 793f, 1305–1306, 1315–1316
obesity and physical inactivity, 357, 1061, 1062b
respiratory tract infections, 887–888
risk behaviours and mental health issues in, 48–49, 400, 411b
sexual experimentation/ high-risk behaviours, 49, 357–358, 358t, 419
sexually transmitted diseases (STDs), 357–358, 358t
substance abuse, 356–357, 358t, 365
suicide, 356, 357b, 358t
heart rate ranges in, 511t
identity searches during
family identity, 355–356
gender identity, 355
group identity, 355, 356f
health identity, 356
moral identity, 356
vocational identity, 356
immobilization effects on, 1202
injuries, 356, 358t
language skills, 355
mental health issues, 48–49, 397, 400, 400b, 402b
minority, 359
morals development, 346t–347t, 348–349
nutrition issues in, 346t–347t, 351–352, 351b, 351t, 1061–1062
physical changes in, 345–348, 352–354, 353t–354t, 775
puberty, 345
relationships with parents, siblings and peers, 346t–347t, 348–349
respiratory rates, 514t
in rural communities, 358–359
safety belts and drunk drivers, 806b
- Adolescence/adolescents (Continued)**
safety threats and interventions, 793, 803t–804t, 806, 806b
self-concept, 328–329, 346t–347t, 348–349, 355–356, 397, 397f, 402, 402b
sexual maturation during, 352–355, 353t–354t, 357–358, 416–417
sexuality, 352–355, 353t–354t, 357–359, 416–417, 417f
skin, hair and hygiene changes, 833
sleep behaviours, 1000
teaching methods for, 295, 295b
teen pregnancy, 358
- Adrenal glands**, 473, 474f, 475
- Adrenocorticotrophic hormone (ACTH)**, 473, 474f, 475
- Adult day care centres**, 377–378
- Adult day support programs (ADSP)**, 25–26
- Adults**
acceptable respiratory rates in, 514t
behavioural signs of sensory deficits in, 1308, 1309t
exercise recommendations for, 784b
heart rate ranges in, 511t
immobilization effects on, 1202
safety threats and interventions, 793, 806
- Advance directives**, 89–90, 104, 455–457
- Adventitious sounds**, 576–577, 578t
- Adverse events**
accidents, 794
adverse occurrence reports, 105, 225–226, 794
diagnostic error sources, 169–170, 170b
ethics of reporting, 90
and negligence, 96, 98–99, 98b, 105
Adverse occurrence reports, 90, 96, 98–99, 98b, 105, 225–226, 794
Adverse reactions, 190
- Advocacy**
Cathy Crowe's homelessness, 11–12, 11b
as ethical responsibility of nurses, 83–85
for primary health care, 128b
skills in community health nursing, 44–46, 50
- Aerobic exercises**, 774–775, 783
- Afebrile**, 493–494
- Affective domain**, 285t
- Affective learning**, 293b, 294, 302b
- Afterload**, 879
- Age groups**
sensitivity during physical assessments, 543, 544b
- Age/aging; See also older adults; specific age groups**
accident risks with, 793b
ageism, 376
"aging well" and quality of life, 374–375, 377, 377f, 380–382
challenges of, 375
cultural belief variations regarding, 116–117, 117t
as determinant of health, 5, 8
Epp Report on, 4, 5f
older adults coping with, 377, 377b
physical exams according to, 546–547
physiological and mental changes with
blood pressure, 380, 381t, 388, 521–522, 534b
body temperature, 492–493, 534b
bowel elimination, 1167, 1167t
cardiopulmonary functioning and oxygenation, 892–893, 892t
cognitive skills, 382–384, 383b, 383t
delirium, 382–383, 383b, 383t
dementia, 383–384, 383t
depression, 383t, 384
fluid, electrolyte, and acid-base balance, 947–948, 947b–949b
hearing loss, 380–382, 381t, 835, 1305–1306, 1305b
incontinence (See fecal incontinence; urinary incontinence)
infections, 626b, 627–629, 628t
kidney and bladder function, 1120
olfactory sense, 1305–1306
osteoporosis, 380, 381t, 604, 605t, 606b
pain, 1022–1026, 1023b, 1024t–1025t
pressure ulcers, 1251, 1251b, 1257, 1275t
self-concept, 397, 403, 404b, 405f
self-esteem, 317–319, 319f

- Age/aging (*Continued*)
 sensory function, 1305–1306, 1305b
 skin, 1251b
 sleep quality, 1001, 1010b
 urinary elimination, 1120, 1121b, 1136b, 1154b
 vision, 380, 381t, 1305–1306, 1305b
 vital signs, 492–493, 534b
 psychosocial theories of, 376–377
 safety threats and interventions, 806–807, 807b, 807f
 statistics in nursing workforce, 16b
 stressors unique to different, 475b, 477–478, 478b
 surgery risk factors, 1330, 1331t–1332t
 theories, 376–377
- Ageism, 376
- Aggressive responses, 258
- Aging parents
 and caregiving during middle adulthood, 370
- Aging population
 affecting health care costs, 26
- "Aging well"
 and quality of life, 374–375, 377, 377f, 380–382
- Agnostics, 436
- AIDS Prevention Street Nurse Program, 49, 49b
- Air pollution, 792
- Airborne transmission, 621–622, 621t, 641t, 645–646
- Airway clearance, 898b–899b, 899f, 901–902
- Airway obstruction, 882t, 898b–899b
- Airway resistance, 881
- Alarm reaction
 in general adaptation syndrome, 473, 474f
- Alcohol abuse
 in Aboriginal population, 121
 adolescent, 356–357, 358t, 365, 400, 400b
 as coping mechanism, 406–407
 drunk driving accidents, 806, 806b
Eating Well with Canada's Food Guide
 recommendations, 1056
 fetal alcohol syndrome (FAS), 329b
 and hypertension, 521–523
 older adult, 388–389
 school-aged children, 350t–351t
 and self-esteem, 400, 400b
 signs on skin, 552, 552t
 sleep problems due to, 996–998, 997b, 1001, 1001b
 as surgical risk factor, 1333
 teratogens, 329b
 young adult, 364–365
- Aldosterone, 940, 1396t–1398t
- Aldrete score, 1358–1359, 1358t
- Algae, 618–619, 620t
- Algonquian, 121
- Alkaline phosphatase test, 1170t
- Allen, Dr. Moyra, 59b–60b, 60
- Allergies
 assessing history of, 891
 latex sensitivity, 1333, 1352, 1354b
 medication, 667, 667t, 684
 skin testing for, 734
 as surgery risk factor, 1333, 1352
- Alliances, 284
- Allopathic medicine, 751–752
- Allotaxis, 473
- Alopecia, 554, 833, 834t
- Alpha-adrenergic blockers, 1136b, 1137t
- Alternative therapies; *See also*
 complementary and alternative medicine (CAM)
 definitions, 752–755
- Alveoli, 880–882, 881f, 887, 1199
- Alzheimer's disease, 383–384, 391b, 842b, 1115
- Amblyopia, 560b
- Ambulacrum, 814, 814f
- Ambulatory care
 providing care to older adults, 379b
- Ambulatory surgery
 description of, 1327, 1335b
- Postanesthesia Recovery Score for Ambulatory Patients (PARSAP), 1359, 1359t
- postoperative instructions, 1359–1369, 1360b
- American Medical Informatics Association (AMIA), 240
- American Society of Anesthesiologists, 1328t
- Amino acids, 753t–755t, 1052
- Amputees, 713, 713f–715f, 714b–719b
- Amputations, 1267–1268, 1267f
- Amylase test, 1170t, 1388t–1389t, 1396t–1398t
- Anabolism, 1055
- Anaesthesia, 1024, 1041–1042, 1168, 1356–1357
- Analgesics, 1024, 1039–1043, 1039b–1041b, 1041f, 1064t
- Analogies, 304
- Anaphylactic reactions
 to blood transfusions, 988t
 to medications, 667
- Anemia, 882–883, 882t
- Aneurysms, 596–597, 597b
- Anger, 449–450, 449t
- Angina pectoris, 886
- Angiography, 1129t–1130t
- Angiotensin II receptor blockers, 522t, 1113–1114, 1114f
- Angiotensin-converting enzyme (ACE) inhibitors, 522t
- Angle of Louis, 507b–511b, 509f
- Anglophones, 109–111, 111b
- Animism, 341
- Anion gap, 945, 946t
- Anions, 937, 940–941, 946t
- Ankle joint, 1204t–1208t, 1240f, 1241
- Anorexia nervosa, 357, 1061, 1063t
- Answerability, 82b–83b, 83
- Antacids, 1064t
- Antagonistic muscles, 772
- Anthropometric measurements, 1210
- Anthropometry, 1068
- Anti-arrhythmics, 1064t
- Antibiotics, 623, 1064t, 1169t, 1333t
- Anticholinergics, 1169t
- Anticipatory grief, 450
- Anticonvulsants, 1001, 1001b, 1064t, 1333t
- Antidepressants, 1001b, 1064t
- Antidiuretic hormone (ADH), 473, 474f, 940, 949, 1116, 1128t
- Antidysrhythmics, 1333t
- Antimicrobial stockings, 1360–1361, 1365–1366
- Antigravity muscles, 772
- Antihypertensives, 1064t, 1333t
- Anti-inflammatory drugs, 1064t
- Antioxidant supplements, 753t–755t
- Antioxidants, 763–766, 764t–765t
- Anti-Parkinson drugs, 1001b, 1064t
- Antipsychotics, 1064t
- Antipyretics, 505
- Anuria, 1115
- Anus
 and bowel elimination, 1160f, 1162, 1162f
 physical assessment/examination of, 603, 603t, 604b, 1167, 1167t
- Anxiety
 in adolescents, 346t–347t, 348–349, 353t–354t, 356, 357b
 effects of
 on pain, 1025
 on physical activity tolerance, 779b
 on pulse rates, 512t, 513
 on respiration, 514b, 520
 on sexual function, 426–430, 427b–428b
 on sleep, 995, 1005
 on urination, 1117
 during middle adulthood, 371
 physical examination, 543
 spirituality positively benefiting, 434–435, 437b
 before surgery, 1351
- Aortic pulsation, 597
- Apgar score, 328, 329t
- Aphasia, 258, 259b, 611
- Apical impulse, 578, 581f
- Apical pulse rate, 506–511, 507b–511b, 509f
- Apnea, 514, 517t, 894t
- Appearance
 and behaviour assessment, 546–548
 body image stressors, 401f, 402
 and hygiene, 828–829
 of infections, 628–629
 mental status indicated by, 610–611
 personal, 247, 828–829
 self-concept influenced by, 399, 399f
 sensitivity in teenage girls, 397, 402b
- Appetite
 anorexia, 1078–1079
 bowel elimination assessment of, 1166
 deficits in older adults, 379–380, 835, 1305–1306
 immobility affecting, 1198
 promoting healthy, 1079
 and taste deficits, 1304b, 1305–1306
- Applied ethics, 84
- Appraisal, 473
- Approximated skin edges, 1262t–1263t, 1264, 1265f
- Aquaporins, 1053
- Arcus senilis, 561
- Arguing, 258
- Aromatherapy, 753t–755t
- Art therapy, 753t–755t
- Arterial blood gases (ABGs)
 analysis to measure acid-base balance, 942–945, 946t
 measurement and ranges of, 515b–517b, 517, 1388t–1389t
 testing, 896b, 1388t–1389t
- Arterial oxygen saturation, 515b–520b, 517, 1388t–1389t
- Arterial ulcers, 1266–1267
- Arterial wall elasticity, 521
- Arteriograms, 1129t–1130t
- Arthritis, 389–390
- Artificial airways, 884, 913b–919b
- Artificial eyes, 835b, 864, 864f
- Artificialism, 341
- Asepsis/ aseptic techniques, 632–659
 bagging waste or linen, 641b–643b, 645
 cleaning, 633, 633b
 disinfection and sterilization, 633–634, 633b, 634t
 failure, 98b
 handwashing/hand hygiene, 635–639, 636b–639b, 652b–655b
 during intravenous (IV) therapy, 965f, 970–971, 970b, 974b–984b, 978–985, 978f
 ports of entry and exit, 634–635, 639–640
 principles and history of surgical, 1326
 reservoir control/elimination, 634, 634b
 routine practices and isolation guidelines, 640–644, 641b–643b, 641t
 specimen collection guidelines, 645, 646b
 surgical, 626b, 641t, 646–659, 648b, 648f–650f, 652b–659b, 1350–1351
 transmission control, 635–639, 636b–639b
 wound cleaning, 1277–1280, 1278b–1279b, 1289–1294
- As-needed ("prn") orders, 669t, 677
- Aspiration
 dangers with oral medications, 692b
 infant, 333, 334b–335b
 swallowing, 1054, 1072b–1073b, 1160, 1161f
- Assault
 against Aboriginal women, 121
 as nursing legal issues, 97
 and violence in young adulthood, 365
- Assertive communication, 251, 485
- Assertiveness training, 485
- Assessments; *See also* physical assessments
 and examinations; individual chapters
 and nursing topics
 application to care planning, 170–171, 187
 of client's self-concept, 405–407, 406f, 406t, 407b
 communication skills needed during, 244b, 251–253, 251b
 community, 51–52
 cultural, 114–119, 114b–115b, 117t, 160
 definition of nursing process, 153–154, 154f
 diagnostic error sources, 169–170, 170b
 gerontological nursing, 378–387
 in nursing process
 CNA competencies for RNs, 164–165
 concept maps, 162, 162f
 critical thinking importance during, 154–155, 155f
 cultural considerations, 114–119, 114b–115b, 117t, 160
 data analysis, 161, 161b
 data collection, 154f, 155–162, 156f
 of diagnostic and lab data, 160–161
 documentation of data, 162
 purpose of, 154
- Assimilation
 cognitive, 313
 versus multiculturalism, 111
- Assisted suicide, 103
- Assisted-living facilities, 24, 377–378, 378b
- Assistive devices
 crutches, 1243–1246, 1244b, 1244f–1245f
 hand rails for toilets and showers, 810–820, 810f, 811t
 for mobility, 1243–1246, 1243f
 for sensory deficits, 1310, 1310b, 1316–1317, 1317b, 1322
- Association of Operating Room Nurses (AORN), 1326
- Assumptions
 defining in scientific theorizing, 54, 56t
- Asthma, 349, 577
- Asystole, 884, 885t–886t
- Atelectasis, 887, 1199, 1330–1332, 1360, 1363–1365, 1364t–1365t
- Atheists, 436
- Atherosclerosis, 582b, 583, 585t, 586b
- Athlete's foot, 832t
- Atria, 879–880, 879f
- Atrial fibrillation, 884, 885t–886t
- Atrioventricular (SA) nodes, 879–880, 879f
- Atrophy
 disuse, 1200
 labia majora, 599
 skin, 553, 554b
- Attachment, 319–320
- Audiologists, 1305
- Auditory sense
 definition of, 1301
- Auditory system
 anatomy and physiology, 1302t
 changes with aging, 380, 381t
 functions, 1302t
- Audits
 of patient records, 206
- Auricles, 564–565, 565f
- Auscultation; *See also* individual body systems
 for blood pressure measurement, 523–524, 524b–528b, 529–530, 530f, 583
 for bowel elimination problems, 1167
 during cardiopulmonary assessment, 893, 893t
 for carotid artery bruit, 583–584, 584f
 of heart, 581–582, 581f
 procedures and characteristics of sounds, 540–541
- Auscultatory gap, 530–531
- Authenticity, 243
- Authority
 competency in nursing, 131f, 132
- Autoimmune disorders, 619, 620t–621t, 622–624, 627, 627b, 1332, 1395t–1396t
- Autologous transfusions, 986
- Automated dispensing systems (AMDS), 678, 678f
- Automated external defibrillator (AED), 884
- Automatic blood pressure devices, 531, 531f
- Automatic responses, 257
- Autonomic nervous system (ANS), 1020, 1020t
- Autonomous stage, 314–315
- Autonomy
 competency in nursing, 131f, 132
 ethical responsibilities concerning, 83–85
 older adult's stress involving, 317–319, 319f, 478
 in patient end-of-life decisions, 455–457
 of physicians to practise, 17
 respecting in communication, 251
 versus shame/doubt, 318t, 398b
- Autopsy, 467
- Axilla
 bathing from fingers to, 843b–850b, 845f
 temperature measuring site, 495–500, 495b–500b
- Ayurveda, 753b, 753t–755t
- B**
- Baby boomers, 26
- "Baby talk", 250, 252, 252b
- Back rubs, 850–851
- Bacteria, 618–619, 620t
 aerobic versus anaerobic, 620
 epidermal, 826–827
 urinalysis findings of, 1128t, 1396t–1398t
 urinary tract infections (UTIs), 623t, 624–626, 625b–626b, 1117, 1119–1120
- Bacteriuria, 1117, 1121b
- Bag bath, 850, 850f
- Balance
 benign positional vertigo, 1303–1305, 1304b
 and body alignment, 773, 778, 778f, 1196, 1204–1209, 1208f–1209f
 documenting patient's, 1233t
 and falls (*See also* falls)
 in health care setting, 794, 798t
 in mobility impaired patients, 1196b, 1242f
- Menière's disease, 1304b

- Balance (*Continued*)
 mind-body-spirit connection
 in Aboriginal spirituality, 121–122
 spirituality, 433, 435, 435b
 physical assessment of, 1308, 1309t
 and proprioception, 773
 sensory function affecting, 773, 1308
 and standing centre of gravity, 773, 778,
 778f, 1209f
- Baldness, 368, 369t
- Ball, Dr. Marion, 229
- Bandages, 1294, 1295b–1298b
- Bangkok Charter, 5–6
- Bargaining stage of grief, 449–450, 449t
- Bariatric patients
 higher surgery risks in, 1330–1332
 moving and positioning, 1231b
- Barium, 1172b
- Basal cell carcinoma, 553, 555b
- Basal metabolic rate (BMR), 491,
 1051–1059
- Base excess, 945, 946t
- Basic critical thinking, 142, 143f
- Bathing
 Alzheimer's or dementia patients, 842b
 commercial cleansing packs ("bag
 bath"), 850, 850f
 complete bed bath, 841–854, 843b–850b
 partial bed bath, 841–854, 843b–850b
 perineal care, 843b–850b, 850
 unexpected outcomes and interventions,
 843b–850b
- Battery, 97
- Beau's lines, 558b
- Bed rest, 1198, 1202, 1203b, 1211
- Bed-Check exit alarm system, 814, 814f
- Bedpans
 for female urination, 1114
 positioning for defecation, 1163–1164,
 1164f
- Beds; *See also* transfer techniques
 maintaining comfortable patient,
 866–873, 866f–867f
 making occupied and unoccupied,
 867–873, 868b–874b, 873f
 positions of, 867, 867t
 surgical or recovery, 873, 873f
- Bedsore; *See* pressure ulcers
- Behavioural approach to health, 3–4, 6f
- Behavioural changes
 with immobility, 1202, 1211–1212, 1212b,
 1220–1221
 with sensory deficits, 1303, 1304b
- Behavioural effect questions, 285t
- Behavioural responses
 to pain, 1020–1021
- Behavioural risk factors, 3–4, 6f
- Behavioural systems model, 59b, 61
- Behaviours
 assessment of, 546–548
 associated with normal grief, 454b
 coping, 406–407, 406b
 mental status indicated by, 610–611
 risk
 in adolescents, 48–49, 397, 400, 400b,
 402b
 stigmatizing, 47, 49, 50b
 of sleep, 993b
- Beliefs
 cultural, 110–119
 in families, 284
 understanding patient's spiritual, 434,
 434b, 438–441, 438f
 and values, 80–82
- Beneficence, 85
- Benign (fibrocystic) breast disease, 593
- Benign positional vertigo, 1303–1305,
 1304b
- Benzodiazepines, 1001, 1001b
- Bereavement, 449, 451b
- Best practice guidelines
 on bowel incontinence, 1175
 on caring attitudes and behaviours,
 265b
 conceptual model for developing and
 sustaining leadership, 126, 127f,
 135–136
 continuous learning environment, 133
 on critical thinking and nursing
 knowledge, 144
 and evidence-informed practice, 66–70,
 66b, 73t, 78
 on fall prevention, 144, 393, 393b
 on family nursing, 273–274
 for leadership and management, 130,
 130b, 135
 listings of, 67b
 nurse management of, 130, 130b, 135
 on pain relief ethics, 1018
- Best practice guidelines (*Continued*)
 on pressure ulcers, 1251, 1257, 1274,
 1275t
*Prevention of Falls and Fall Injuries in the
 Older Adult* publication, 393b, 796
 web site information, 144
- Beta-adrenergic blockers
 names and hypertensive actions of, 522t
 sleep affected by, 1001, 1001b
- Bias
 ageism, 376
 CNA's *Code of Ethics* on, 111
 definition of, 111
 against older adults, 257
 against religions or faiths, 440–441
- Bicarbonate
 measurement and normal values, 1337t,
 1388t–1389t
 role as buffer, 937t, 941, 945, 946t
- Bile, 1055, 1388t–1389t
- Bilirubin, 1388t–1389t, 1396t–1398t
- Binders, 1294, 1295b–1298b
- Biocultural ecology
 of Aboriginal peoples, 120–121
 questions during cultural assessments,
 117t, 118
- Bioelectromagnetism-based therapies,
 753b
- Bioethics, 84–85
- Biofeedback, 753b, 753t–755t, 760–761,
 760f, 1037
- Biofield therapies, 753b, 753t–755t
- Biological clocks, 993
- Biologically based CAM therapies, 753b,
 753t–755t
- Biomedical ethics, 84–85
- Biophysical developmental theories,
 311–313
- Chess and Thomas Theory of
 Temperament Development,
 312–313
- Gesell's Theory of Maturation
 Development, 312
- Bioreformation, 666–667
- Biot's respiration, 517t
- Birth control pills, 421, 422t
- Birth order, 280
- Birth process, 328, 329b, 330–332
- Birth weight, 5, 7
- Bisexuality, 416
- Black cohosh, 764t–765t
- Bladder; *See also* urinary elimination
 and act of urination, 1115
 anatomy and physiology, 595f,
 1113f–1114f, 1114–1115
 assessment of, 543, 1120f, 1123
 complete emptying of, 1135, 1154–1156
 control therapies, 1154–1156, 1154b
 inflated balloon placement in, 1143f
 palpation, 595f, 597
 preparation before surgery, 1351–1352
 training, 1154b, 1155
 urinary incontinence (*See* urinary
 incontinence)
 urinary retention, 1118–1119
- Bladder neck, 1114f, 1115
- Bladder ultrasonography, 1129t–1130t
- Blanching, 1251–1252, 1252f
- Blastocyst, 327
- Blended families, 274–275, 275b
- Blindness, 1313–1316, 1322f
- Blocking, 257–258
- Blood
 found during urinalysis, 1128t,
 1396t–1398t
 serum, plasma and whole blood
 chemistry tests, 1388t–1389t
- Blood flow
 changes with aging, 892t
 indicators for assessing, 585t
 myocardial, 878, 878f
 regulation, 879
 tissue perfusion, 587–588, 588t
- Blood glucose
 and glycemic index, 1052
 measurement and normal values,
 1081–1082, 1082b–1087b, 1337t,
 1388t–1389t
 self-monitoring of, 1081–1082,
 1082b–1087b
 urinalysis to measure, 1128t, 1396t–1398t
- Blood groups, 985–987, 986b–987b, 986f,
 986t, 988t
- Blood plasma, 937, 985–986, 1388t–1389t
- Blood pressure (BP), 521–533
 acceptable adult ranges, 490b–491b, 491f
 arterial wall elasticity, 521
 automatic blood pressure devices, 531,
 531f
- Blood pressure (BP) (*Continued*)
 benefits of exercise for, 522, 774b, 787
 blood volume and viscosity, 521
 cardiac output, 506, 521
 changes with aging, 380, 381t, 388, 534b
 common errors in measuring, 494t
 cuff, 524–529, 524b–528b, 525f–526f,
 528f, 529t, 531f
 definition and physiology of, 521–533
 diastolic blood pressure, 521–533, 522t,
 524b–528b, 529t
 electronic measuring devices, 532b
 factors influencing, 521–522
 forearm *versus* upper arm measurement
 of, 529b
 health promotion tips regarding, 533,
 533b
 hypertension, 522–523, 522t
 hypotension, 523
 lower extremity blood pressure cuff,
 531, 531f
 manometers, 524–529, 524b–528b,
 525f–526f, 528f, 529t, 531f
 measuring equipment and procedure,
 523–533, 524b–529b, 529t
 patient teaching, 533, 533b, 586b
 peripheral resistance, 521
 recommended screenings according to
 age, 545t–546t
 self-measurement, 531–533
 sphygmomanometer, 524–529,
 524b–528b, 525f–526f, 528f, 529t,
 531f
 systolic blood pressure, 521–533, 522t,
 524b–528b, 529t, 530b
 venous, 583, 585f
- Blood specimens, 645, 646b
- Blood tests
 cardiopulmonary, 895t
 hematology tests, 1393t
 serum, plasma and whole blood
 chemistry values, 1388t–1389t
- Blood transfusions, 985–987, 986b–987b,
 986f, 986t, 988t
- Blood urea nitrogen (BUN), 1337t,
 1388t–1389t
- Blood vessels
 palpation of, 540, 540t
- Blood volume, 521
- Bloodborne diseases
 health care-associated infections,
 624–626, 625b–626b
 human immunodeficiency virus (HIV),
 792
- Bodily damage; *See* injuries
- Body
 planes of, 1204f
- Body alignment
 and mobility, 1196, 1204–1209,
 1208f–1209f
 and physical activity, 773, 778, 778f
- Body fluids; *See also* fluid, electrolyte, and
 acid-base balances
 carrier-mediated transport, 938, 939f
 case example, 937b
 cations and anions, 940–941, 946t
 composition of, 937, 937t
 diffusion, 938, 938f
 distribution of, 937, 937t
 filtration, 938, 939f
 hormonal regulation, 940
 input and output regulation and thirst,
 938–940, 939t, 940f
 osmosis, 938, 938f
 and skin integrity, 1272b
- Body image
 in adolescence, 397, 397f, 402, 402b
 assessment questions regarding, 406t
 changes after surgery, 1334
 issues during pregnancy, 367, 368t
 older adult, 392
 positive promotion by nurses, 404–405,
 405b, 408b–409b, 408f
 self-concept influenced by, 397, 399,
 399f, 402, 405b
 stressors, 401f, 402
- Body lice, 554–555, 557b, 834t, 861
- Body mass index (BMI)
 calculation of, 1068
 and mobilizing bariatric patients, 1231b
 physical assessment/examination of,
 548–550, 549f–550f, 549t
 recommended screenings according to
 age, 545t–546t
- Body mechanics
 pathological conditions affecting
 chronic diseases, 774
 congenital abnormalities, 774
 degenerative diseases, 774
- Body mechanics (*Continued*)
 principles and physiology
 alignment and balance, 773, 1196,
 1204–1209
 gravity and friction, 772–774, 778,
 778f, 1196
 planes of body, 1204f
- Body odours
 assessment during physical exam, 541,
 547
 olfaction to analyze, 541, 542t
- Body system defences, 623, 623t
- Body systems; *See also* specific body
 systems
 postoperative assessment
 abdominal gas, 1362, 1366–1367
 circulation, 1360–1361, 1364t–1365t,
 1365–1366
 comfort, 1362, 1366
 fluid and electrolyte balance, 1361,
 1367
 gastrointestinal function, 1362,
 1364t–1365t
 genitourinary function, 1362,
 1364t–1365t, 1366–1367
 neurological functions, 1361, 1367
 pain, 1362, 1364t–1365t, 1366
 respiration, 1360, 1363–1365,
 1364t–1365t
 self-concept, 1368
 skin integrity and wound
 characteristics, 1361–1362,
 1364t–1365t
 temperature control, 1360–1361,
 1366–1367
 urinary and bowel function,
 1364t–1365t, 1367–1368
 review during health history
 assessment, 157b–158b
- Body temperature
 acceptable adult ranges, 490b–491b, 491f
 basal metabolic rate (BMR), 491
 changes in older adults, 492–493, 534b
 chemical strip thermometers, 502, 502f
 electronic thermometers, 495b–499b,
 501–502, 501f
 factors affecting, 492–494
 fever or pyrexia, 493–494, 493f, 505,
 505b
 frostbite, 494
 glass thermometers, 502, 502b–503b
 health promotion tips regarding, 533,
 533b–534b
 heat exhaustion, 494
 heat loss, 492
 heat production, 491
 heatstroke, 494, 505
 and hygiene of skin, 826t
 hyperthermia, 494, 502, 504b
 hypothalamus control of, 491, 493–494,
 493f
 hypothermia, 494, 494t, 502, 505
 measurement sites, 491b, 495–500,
 495b–500b
 nursing process application to
 variations in, 494–506, 495b–499b,
 504b
 physiology, 491–494, 491b, 491f
 postoperative control of, 1360–1361,
 1366–1367
 pulse rates influenced by, 512t, 513
 ranges of normal, 491, 491f
 skin's role in, 492
 thermoregulation, 491–492, 494, 502,
 504b
- Bolus
 of food, 1160–1162, 1161f
 infusions, 736, 737b–741b, 738f–740f
- Bonding, 328
- Bones
 disuse osteoporosis, 1200
 osteoporosis (*See* osteoporosis)
 and physiology of movement, 770–771
 trauma causing immobility, 1198
- Bony prominences
 pressure ulcers, 1251, 1252f
- Borborgmi, 596
- Botulism, 1079t
- Boundaries
 within families, 280
 spiritual care, 434b, 441
- Bowel elimination
 bedpans, 1163–1164, 1164f
 benefits of exercise for, 1164–1165, 1178,
 1178b
 Bristol Stool Chart, 1166, 1166f
 changes with immobility, 1201, 1210t,
 1211, 1220
 colon cancer screening, 1169, 1171b

- Bowel elimination (Continued)**
 common problems with
 constipation, 1172, 1173f, 1174b
 diarrhea, 1174
 fecal impaction, 1172-1174
 fecal incontinence, 1174, 1175b, 1351
 flatulence, 1174-1175
 hemorrhoids, 1175, 1179
 skin breakdown, 1179
 defecation process and positioning, 1163, 1163f
 factors affecting normal, 1164-1165, 1167-1169
 acute illness, surgery and anaesthesia, 1168, 1351
 age-related changes, 1167, 1167t
 diabetes, 1168
 diet, fluids, and fibre intake, 1164-1165, 1176
 enteral feeding, 1168-1169
 exercise and physical activity, 1165, 1178, 1178b
 infectious diseases, 1167-1168
 irritable bowel syndrome (IBS), 1168
 medications, 1169, 1169t, 1177b-1178b, 1179
 pain, 1168
 pelvic floor trauma, 1168
 privacy and personal toileting habits, 1165
 fecal analysis tests, 1398t
 fecal specimens, 1169, 1170b, 1170t
 feces characteristics, 1166, 1166f, 1169, 1171t
 goals following surgery, 1367
 habits, 1165, 1176, 1178-1179
 laboratory tests, 1169, 1170b-1171b, 1170t-1171t, 1388t-1389t, 1398t
 nursing process application to assessment, 1165-1171, 1165f-1166f, 1167t, 1169t-1171t, 1170b-1172b
 evaluation, 1188-1192, 1193f
 implementation and interventions, 1176-1188, 1177b-1179b, 1180t, 1181b-1185b, 1186f, 1189b-1192b
 nursing diagnosis, 1171-1175, 1172b-1175b, 1173f
 planning of care, 1175-1176, 1175f, 1177b-1178b
 radiological and diagnostic tests, 1170-1171, 1172b
 treatment options
 bowel diversions, 1184-1188, 1186f-1188f, 1189b-1192b
 colostomy, 1184-1188, 1186f
 digital stool removal, 1181b, 1185b
 enemas, 1179-1181, 1182b-1184b
 exercise promotion, 1178, 1178b
 food, fiber and fluid adjustments, 1176, 1178b
 ileostomy, 1184-1188, 1186f
 medications, 1179, 1179b, 1180t
 ostomies, 1184-1185, 1185t, 1186f-1188f, 1189b-1192b
 retraining, 1136, 1176, 1178-1179
 surgery and nasogastric intubation, 1181-1184, 1185t
Bowels; See also bowel elimination
 bowel motility, 596, 596b
 fecal analysis tests, 1398t
 paralytic ileus, 596, 596b
 preparation before surgery, 1351-1352
 sounds, 596, 596b, 1167, 1173b, 1173f
Bowlby's attachment and separation theory, 319, 319b
Bowlby's Four Phases of Mourning, 449-450, 449t
Bowlegs, 1197t
Brachial artery
 for blood pressure measurement, 524b-528b, 525f
 and pulse, 507t, 585-586, 586f-587f
Braden Scale pressure ulcer, 1259-1261, 1260t-1261t, 1274, 1321
Bradycardia, 512, 884, 885t-886t
Bradykinin, 1018b
Bradypnea, 517t, 894t
Brain activity
 and sleep regulation, 993, 994f
Branching diagram
 in Calgary Family Assessment Model (CFAM), 279f
Branching questions, 156f
Braxton-Hicks contractions, 366, 367t
Breakthrough pain, 1022, 1045b
Breast binders, 1294, 1295b-1296b
Breast cancer
 recommended screenings according to age, 545t-546t
Breast cancer (Continued)
 risk categories and assessment, 591t, 593b
 self-examination guidelines, 589-592, 590b, 591t, 593b
Breastfeeding, 328, 335-337, 351b, 363, 366
Breasts
 changes with aging, 380, 381t
 male, 594
 normal lifespan changes in, 591b
 physical assessment/examination of, 589-594, 590b-591b, 591t, 592f-594f, 593b
 quadrants of, 592f
 self-examination, 590b
Breath sounds, 577t
Breathing
 changes with aging, 892t
 mechanics of, 513-514, 514f, 881
 pattern alterations, 514-517, 517t
 pattern and rate tests, 894t
Breathing exercises
 for cardiopulmonary rehabilitation, 933
Breathwork, 753t-755t
Brevity
 during verbal communication, 247
British North American Act, 16-17
Broad-spectrum antibiotics, 623
Bronchial sounds, 577t
Bronchodilators, 1064t
Bronchophony, 577, 896b
Bronchoscopy, 891
Bronchovesicular sounds, 577t
Bronfenbrenner's bioecological theory, 321-322, 322b
Bruits, 583-584, 584f, 596
Buccal medications, 664t, 669, 669f, 670t, 693b-697b
Buccal mucosa, 568-570, 568t, 569f, 827
Buddhism, 442t
Buffers, 941, 941f
Bulbar synchronizing region, 994f
Bulimia nervosa, 357, 1061, 1063t
Bullying, 403, 404b
Burnout, 485-486
Burns
 adolescents, 803t-804t
 fire prevention measures, 807-810, 807b, 808f-809f
 fluid loss and electrolyte imbalance, 949
 infant, 333, 334b-335b
 school-age children, 350t
 toddlers and preschoolers, 340-341, 342t-343t
Workplace Hazardous Materials Information System (WHMIS), 794, 795f
C
Cadexomer iodine, 1288
CAGE substance abuse questionnaire, 548
Calcium
 deficits and osteoporosis, 770
 imbalances, 937t, 942, 943t-944t, 951t-952t
 laboratory values and possible etiologies, 1388t-1389t, 1396t-1398t
 regulation, 940
 Calcium alginate dressings, 1286t, 1288
 Calcium carbonate, 1169t
 Calcium channel blockers, 522t
Calgary Family Assessment Model (CFAM), 278-284, 279f
 branching diagram, 279f
 developmental assessment, 279f, 282
 functional assessment, 279f, 282-284
 structural assessment, 279-281, 279f, 281f
Calgary Family Intervention Model (CFIM), 284-287, 285t
Call lights, 791, 796, 809, 811t
Callus, 832t
Campinha-Bacote, J., 112, 112f
Canada Health Infoway, 231, 232b, 232f, 233
Canada's Food Guide; See nutrition
Canadian Anesthesiologists Society, 1350-1354
Canadian Association for Enterostomal Therapy (CAET), 1251, 1300
Canadian Association of Wound Care (CAWC), 1251, 1257, 1300
Canadian Cancer Society (CCS), 545t-546t, 589-592, 590b, 591t, 593b, 763, 1388t-1389t
Canadian Charter of Rights and Freedoms, 20-21, 111b
Canadian Community Health Nursing Practice Model (CHNC), 44-46
Canadian Constitution Act, 111b
Canadian Council on Health Services Accreditation, 96
Canadian Diabetes Association, 777
Canadian Health Act of 1984
 jurisdictions and governance of, 19
 principles of, 17-18, 18t
Canadian health care delivery system, 15-28; *See also health care delivery system*
Canadian Health Outcomes for Better Information and Care (C-HOBIC) Initiative, 236b
Canadian Heart and Stroke Foundation, 889-890, 1068
Canadian Holistic Nurses Association, 752, 753
Canadian Hypertension Education Program, 522-523
Canadian Institute for Health Information (CIHI)
 functions of, 229-231
 health care spending statistics by, 19
 nursing workforce statistics and facts by, 15-16, 16b, 1372
Canadian Journal of Nursing Informatics, 239, 239b
Canadian Journal of Nursing Research, 71, 72b
Canadian legal system; See legal issues
Canadian Mental Health Association, 17
Canadian Multiculturalism Act, 111b
Canadian Nurses Association (CNA)
 on client education, 292-293
Code of Ethics, 44, 80-86, 82b-83b, 103, 148
 competencies defined by, 164-165
 defining evidence and evidence-informed practice, 66, 66b
E-Nursing Strategy for Canada, 237-239
 on Health Information: Nursing Components (HI:NC), 233, 234t
 historical origins of, 36-37
 on the human act of caring, 265
 on International Classification for Nursing Practice (ICNP), 233-235, 234f-235f, 235t
 on leadership and management, 125-139
 nursing workforce statistics and facts by, 15-16, 16b, 1372
 standards of care, 95-97, 148
 on ten rights of medication administration, 679b, 681-684
Toward 2020: Visions for Nursing, 1384
 on value of practical nursing, 1372
Canadian Nurses Protective Society (CNPS), 97-102
Canadian Nursing Informatics Association (CNIA), 239, 239b
Canadian Organization for Advancement of Computers in Health (COACH), 229, 239-240
Canadian Pain Society, 1033
Canadian Patient Safety Institute (CPSI), 798-799
Canadian Physical Activity Guidelines, 777, 784b
Canadian Red Cross, 16b, 17, 34, 34f, 39
Canadian Society of Exercise Physiology
Canadian Physical Activity Guidelines, 777, 784b
Canadian Système Internationale d'Unités (SI units); See Appendix B
Cancer
 colon cancer, 545t-546t, 1169, 1171b
 endometrial cancer, 545t-546t
 families dealing with childhood, 283b, 284-287, 286b
 as fluid, electrolyte, and acid-base imbalance risk factor, 947b-948b, 950, 951t-952t
 nutrition and, 763
 in older adults, 387-392
 ovarian cancer, 545t-546t
 pain, 1021-1022, 1043-1045, 1044b-1045b, 1044f
 prostate cancer, 545t-546t, 1388t-1389t
 rectal cancer, 545t-546t
 screenings, 365-366, 366f, 545t-546t, 1169, 1171b
 serology-immunology tests, 1395t-1396t
 skin cancer
 prevention and "ABCD" detection, 556b
 recommended screenings according to age, 545t-546t
 tumors and skin integrity, 1268, 1268f
Cancer pain, 1021-1022, 1043-1045, 1044b-1045b, 1044f
Canes, 1243, 1310b
Cannon, Walter, 473, 473f
Cannula, 913b-919b, 918f
Capacity-building skills, 50-51
Capillary refill, 557
Caps, 641b-643b, 641t, 644-645, 649
Car seats, 801-803, 803t-804t, 805f
Carative processes, 264, 265t, 270
Carbohydrates, 1052, 1056-1058, 1057f, 1058t
Carbon dioxide
 electrolyte concentration, 937t
 hypercapnia, 883
 and respiration, 513-521, 880-882
 transport, 882
Carbon monoxide, 791, 808-810, 882t, 883, 891
Carbonic acid-to-bicarbonate ratio and pH, 941, 941f
Carcinoembryonic antigen (CEA) test, 1170t
Cardiac cycle, 578-579, 580f
Cardiac index (CI), 879
Cardiac output, 506, 513, 521, 879, 884
Cardiac workload, 1217
Cardiopulmonary functioning and oxygenation, 877-935
 cardiac function diagnostic test, 895t
 cardiac functioning alterations
 cardiac output alterations, 884
 conduction disturbances, 884, 884b, 885t-886t
 dysrhythmias, 884, 884b, 885t-886t
 myocardial ischemia, 886-887
 valvular heart disease, 884-886
 cardiopulmonary rehabilitation, 932-933
 cardiovascular physiology, 878-887, 878f
 blood flow regulation, 879
 conduction system, 879-880, 879f
 coronary arteries, 878, 878b, 878f
 electrocardiogram (ECG), 880, 880f
 myocardial blood flow, 878, 878f
 structure and function, 878-879, 878f
 systemic circulation, 879
 chest physiotherapy (CPT), 902, 902f-903f, 903t-904t
 critical thinking models, 889f, 897f, 933f
 diagnostic and laboratory tests, 893, 894t-895t, 896b, 1388t-1389t
 nursing knowledge base
 developmental factors, 887-889, 888b
 environmental factors, 889
 lifestyle risk factors, 887-889, 888b
 nutrition and obesity, 888
 smoking, 888b, 889
 stress, 889
 substance abuse, 889
 nursing process application to assessment, 889f, 890-894, 891b-892b, 892t-895t, 894b, 896b, 898b-899b
 evaluation, 898b-899b, 933, 933f
 implementation and treatments, 899-933, 900b, 902b, 902f-903f, 905b-911b, 913b-919b, 921b-927b, 929b-932b
 nursing diagnosis, 894-896, 897b-899b
 planning and concept map, 896-899, 897f, 898b-899b, 899f
 in older adults, 892-893, 892t
 oxygen supply and delivery, 924-929, 925b-927b, 925f-926f, 927t, 928f-929f, 929b-932b, 929t
 oxygenation
 conditions affecting chest wall movement, 883-884
 factors affecting, 882-884
 physiological processes affecting, 882-884, 882t
 physiological processes of, 882-884, 882b
 patient teaching on lifestyle and, 899-901, 900b
 postural drainage, 902, 903t-904t
 respiratory functioning alterations
 hyperventilation, 887
 hypoventilation, 887
 hypoxia, 887
 respiratory physiology, 880-882, 880f-881f
 respiratory gas exchange, 881-882
 structure and function, 880-881, 880f-881f
 respiratory tests and methods, 895t
 suctioning, 902-912, 905b-911b, 908f, 910f, 912f
Cardiopulmonary rehabilitation, 932-933
Cardiopulmonary resuscitation (CPR), 929-932

- Cardiopulmonary system**
 physiology, 878–887, 878f
- Cardiovascular disease**
 diagnostic tests, 1337t
 as fluid, electrolyte, and acid-base imbalance risk factor, 947b–948b, 950, 951t–952t
 patient teaching, 900b
 recommended screenings according to age, 545t–546t
 types of
 cardiac output alterations, 884
 conduction disturbances, 884, 884b, 885t–886t
 dysrhythmias, 884, 884b, 885t–886t
 myocardial ischemia, 886–887
 valvular heart disease, 884–886
- Cardiovascular system**
 benefits of exercise for, 774b, 786–787
 changes with aging, 380, 381t, 388
 changes with immobility, 1199, 1200f, 1210–1211, 1210t, 1217–1219
 heart function alterations
 cardiac output alterations, 884
 conduction disturbances, 884, 884b, 885t–886t
 dysrhythmias, 884, 884b, 885t–886t
 myocardial ischemia, 886–887
 valvular heart disease, 884–886
 and higher surgical risks in older adults, 1331t–1332t
 patient teaching, 900b
 physiology, 878–887, 878f
 blood flow regulation, 879
 conduction system, 879–880, 879f
 coronary arteries, 878, 878b, 878f
 electrocardiogram (ECG), 880, 880f
 myocardial blood flow, 878, 878f
 structure and function, 878–879, 878f
 systemic circulation, 879
 recommended screenings according to age, 545t–546t
- Care counselling**
 in community health nursing, 51
- Care maps**, 210–213, 213b, 214f–217f
- Care plans**
 for community-based settings, 182
 computerized electronic health record (EHR), 182, 204, 223
 in death and dying situations, 459b–460b
 evaluation of, 194–195, 194f
 institutional, 182
 from physical assessments, 539, 540t
 reassessment and modifying, 187, 198–200
 reviewing and revising, 187
 standardized, 219
- Care theory**, 86
- Career**
 changes during middle adulthood, 369
 identity search during adolescence, 356
 importance during young adulthood, 362–363
 stress, 366
- Career development**
 for nursing students, 136–137, 136f
- Caregivers**
 adult day support programs (ADSP) to assist, 25–26
 cultural beliefs regarding, 117t, 118
 encouraging respite for, 287
 within families, 275–276, 276b, 287
 research study on dementia and hope, 76b
- Caries**, 568–570, 568t
- Caring**, 262–272
 beliefs and practices
 of Aboriginal peoples, 122
 cultural assessment of, 117t, 118
 challenge of, 262–263, 270–271
 communicating attitude of, 243, 250–251, 254, 256b
 communicating with touch, 255, 255f, 256b, 268–269
 cultural aspects of, 264, 264b
 defining, 263
 ethic of care, 267–268
 evidence-informed guidelines on, 265b
 gerontic nursing, 375
 importance in Canadian nursing, 262–263
 nursing behaviours that show
 “being there” or “being with”, 265t, 268
 family care, 270, 270b, 270f
 knowing the patient, 269–270
 listening, 269, 269f
 providing presence, 265t, 268
- Caring (Continued)**
 spiritual caring, 264, 270
 touch, 268–269
 patients’ perceptions of, 267, 267t
 spiritual, 438–441, 438f
 theoretical views on
 caring is primary goal, 263
 “human act of caring” theory, 265, 266t
 moral and ethical bases for, 266
 Roach’s caring theory, 265, 266t
 Swanson’s theory of caring, 264, 266t, 269–270
 transcultural caring, 264, 264b
 transformative model of, 264, 265t, 270
 transpersonal caring, 264
 Watson’s carative processes, 264, 265t, 270
 therapeutic touch (See therapeutic touch)
- Caring Curriculum**, 263
- Caring touch**, 268–269
- Carotid artery**
 function and illustrations, 583–584, 583f–585f
 palpation of, 583–584, 583f
 pulse site, 507t
- Carrier-mediated transport**, 938, 939f
- Carriers of pathogens**, 619–620, 620t
- Cartilage**
 and physiology of movement, 770–771, 771f–772f
- Cartilaginous joints**, 770–771, 771f
- Cascade cough**, 932
- Case management**
 in community health nursing, 51
 documentation and reporting, 210–213, 213b, 214f–217f
 model of care, 129–130
- Casts**
 urinalysis findings of, 1128t; 1396t–1398t
- Catabolism**, 1055
- Cataracts**, 560b, 1302, 1304b
- Cathartics**, 1179, 1179b, 1180t, 1351
- Catheterization**
 closed and open drainage systems, 1138, 1148, 1149b–1152b
 comfort, 1153–1154
 in-dwelling or straight urethral
 insertion procedures, 1137–1138, 1137b, 1143f–1145f
 infection risks and prevention, 624, 625b–626b, 1108, 1109t, 1146, 1146f, 1148b
 skin integrity, 1152–1153
- Catheter-related bloodstream infection (CR-BSI)**, 971
- Catheters**
 closed and open irrigation, 1148, 1149b–1152b, 1150f
 condom, 1152, 1153b
 epidural, 1042, 1042f, 1043t
 irrigations and instillations, 1148, 1149b–1152b, 1150f
 potential infection sites, 1108, 1109t, 1146, 1148b, 1150f
 subcutaneous butterfly, 747
 suctioning, 902–912, 905b–911b, 908f, 912f
 suprapubic, 1152
- Cations**, 937, 940–941, 946t
- Cells**
 responses to inflammation, 624
- Centenarians**, 376
- Centers for Disease Control and Prevention (CDCs)**
 communicable diseases, 619, 620t–621t
 on disinfection and sterilization, 633–634, 633b, 634t
 on handwashing/hand hygiene, 635–639, 636b–639b
 isolation guidelines, 640–644, 641t, 643b
- Central auditory processing disorders**, 1304b
- Central nervous system (CNS)**
 damage due to immobility, 1197–1198
 diagnostic tests, 1337t
 diseases affecting chest wall movement and breathing, 883
 sensory nerve receptors, 1302–1305
 sleep regulation, 883
- Central sleep apnea**, 996b–997b, 997–998
- Central vascular access devices (CVAD)**, 959–971, 959f, 1107, 1107f
- Central venous catheters (CVCs)**
 infection risks with, 624, 625b–626b
 parenteral feedings with, 1107–1109, 1107f
- Centralized management**, 131, 131t
- Centrally generated pain**, 1022, 1022t
- Centre FERASI**, 73
- Centre of gravity**, 772–773, 778f, 1209f
- Cerebral cortex**, 882b
- Cerebrospinal fluid**
 laboratory tests, 1399t
- Cerebrovascular accidents (CVAs)**, 889–890
- Certifications**
 evolution of Canadian practical nursing, 1372, 1373t
 postgraduate, 1376
- Cerumen**
 accumulation and hearing loss, 1302t, 1304b
 assessment of, 563–565, 564b, 833, 835, 864–865
 and hygiene, 833, 835, 864–865
 inspecting ear for excess, 833, 1308
- Cervical cancer**, 545t–546t, 598t, 600b
- Cervical cap**, 421, 422t
- Cervical spine**
 joint movement, 1204t–1208t
- Chain of infection**
 infectious agents, 619, 619f, 620t–621t
 modes of transmission, 619f, 621–622, 621t
 portal of entry, 619f, 621t, 622, 622b, 639–640
 portal of exit, 619f, 620–621, 634–635
 reservoir, 619–620, 619f, 620t, 634, 634b
 susceptible hosts, 619f, 621t, 622, 622b, 627–628, 640–646, 640b
- Chamomile**, 764t–765t
- Chancres**, 599
- Change-of-shift reports**, 223–225, 224t
- Channels of communication**, 245f, 246
- Chaplains**, 441b
- Charters**
 outlining patient rights, 20–21
- Charting**
 abbreviations, symbols and acronyms, 206–207
 common errors in, 204, 205t, 206–207
 description and purposes of, 203–204
 error prevention, 206–208
 example of standardized form, 211f–212f
 legal guidelines for, 204, 205t
 quality and accuracy, 206–208
 sample narrative notes, 210b
 security mechanisms, 203, 222
 SOAP or SOAPIE, 209, 209b
 standard patient, 203–204, 211f–212f
 traditional types and criteria, 207t, 208–213, 210t
- Charting by exception (CBE)**, 210, 211f–212f
- Chemical strip thermometers**, 502, 502f
- Chemicals**
 oxygenation regulation, 882b
 Workplace Hazardous Materials Information System (WHMIS), 794, 795f
- Chemoreceptors**, 882b
- Cherry angioma**, 553
- Chess and Thomas Theory of Temperament Development**, 312–313
- Chest**
 and lung expansion techniques, 1217
 pain, 890
- Chest physiotherapy (CPT)**, 902, 902b, 902f–903f, 903t–904t, 905b–911b, 1217
- Chest tubes**
 care of, 921b–924b
- Chest wall**
 anatomical landmarks, 573f
 movement
 during breathing, 513–514, 514f
 conditions that affect, 883–884
 affecting oxygenation, 882t
- Chest x-rays**
 of lungs, 896b
- Cheyne-Stokes respiration**, 517t
- Child abuse**
 in infancy, 333, 336b
 laws and reporting, 104–105
 nursing responsibilities and awareness of, 47–48, 423–424, 423b
- Child maltreatment and neglect**, 333, 336b
- Child-bearing cycle**, 363, 363b
- Childbirth**
 cultural beliefs regarding, 118b
 process of, 328, 329b, 330–332
- Children; See also adolescence; preschoolers; school-age children**
 acceptable respiratory rates in, 514t
 behavioural signs of sensory deficits in, 1308, 1309t
- Children (Continued)**
 exercise recommendations for, 784b
 medication dosages and administration, 674–675, 674t, 688, 690b
 physical examination of, 543, 544b
 safety threats and interventions, 793, 803–805, 803t–804t, 805f–806f
 self-esteem, 400
 skin and hygiene changes in, 833
 spending statistics, 19
 teaching methods for, 295, 295b
 vision screening, 345, 1315b
- Children’s Aid Society**, 17
- China**
 missionary nurses in, 33–34, 33f, 118b, 437–438
 traditional Chinese medicine, 118b, 753b, 753t–755t, 762, 762f, 762t
 yin and yang balance, 118b
- Chiropractic medicine**, 753t–755t, 761–762
- Chlamydia**, 365, 420
- Chloride**
 imbalances, 937t, 942
 measurement and normal values, 1337t, 1388t–1389t, 1399t
 regulation, 941
- C-HOBIC Initiative**, 236b
- Choking**, 340–341, 342t–343t, 1061b
- Cholecystectomy**, 1327
- Cholecystitis**, 597
- Cholesterol**
 laboratory values and possible etiologies, 1388t–1389t
 and nutrition, 1053
 tests during cardiopulmonary blood studies, 895t
- Cholesterol lowering drugs**, 1064t
- Chordotomy**, 1043
- Christianity**, 434–435, 442t, 1065t
- Chromosomes**, 327
- Chronic grief**, 450
- Chronic illnesses**
 affecting chest wall movement and breathing, 883–884
 definition of, 48–49
 as fluid, electrolyte, and acid-base imbalance risk factor, 947–950, 947b–948b
 spirituality aiding coping with, 433–438, 438f
 supporting through education, 291b
- Chronic kidney disease**
 managing, 989b
 patient teaching, 959b–969b
- Chronic obstructive pulmonary disease (COPD)**, 577, 881, 887, 898b–899b, 899f, 947–949, 947b
- Chronic pain**, 1021
- Chronic wounds**, 1257–1258, 1257b, 1264t
- Chyme**, 1055–1056, 1161–1162
- Circadian rhythms**, 493, 493f, 993, 997b
- Circle of life beliefs**
 in Aboriginal peoples, 121–122, 310b, 312f
- Circular communication**
 with families, 283, 285t
- Circulating nurses**, 1326
- Circulation**
 aging effects on medication, 688–690, 690b, 691f
 changes and infections in older adults, 624–627, 626b, 628t
 postoperative assessment of, 1360–1361, 1364t–1365t, 1365–1366
- Circumcision**, 332, 601, 601f
- Circumduction**, 1204, 1204t–1208t
- Cirrhosis**, 556
- Civil law**, 95
- Clarifying**, 256
- Clarity**
 and accuracy in charting, 206–207
 during verbal communication, 247
- Classifications**, 2–3, 348
- Cleaning; See also handwashing**
 asepsis technique, 633, 633b
 and irrigation of wounds, 1277–1280, 1278b–1279b, 1289–1294, 1290f, 1291b–1293b
- Cleansing enemas**, 1179–1181, 1182b–1184b
- Client care**
 philosophies of, 126–136, 128b
- Client education**, 290–308
 adapting around illness grieving process, 305–306, 305t
 awareness of learning disabilities and barriers, 304–305
 in death and dying situations, 466b
 goals of, 291, 291b–292b, 299, 300b, 306
 hygiene, 841, 841b–842b

- Client education (*Continued*)
 learning domains, 293–294, 293b, 305–306, 305t
 learning objectives, 297, 299
 learning principles, 294–297, 295b
 medications, 683, 685
 motivation to learn, 296–298, 297t
 preoperative teaching plan, 1338
 and psychosocial adaptation to illness, 305–306, 305t
 research on effectiveness of, 292b
 social learning theory, 296
 teaching methods and processes, 292–293, 293b, 295b, 295f, 297, 299, 301–302, 301b–302b
 teaching tools, 301b, 303t
 teaching *versus* nursing process, 297, 297t, 300b
 assessment, 297–306, 297t, 298b, 300b, 302b
 evaluation, 297t, 300b, 306
 implementation, 297t, 301, 302b
 nursing diagnosis, 297t, 298–299, 300b
 planning, 297t, 299, 300b
 Client identification bracelets, 668f, 682f, 1354
 Client outcomes
 HI:NC definition of, 233, 234t
 Client safety; *See* safety
 Client teaching; *See* client education; teaching
 Client-centred care
 caring as foundation of, 262–272
 during implementation process, 187, 188f
 Client-centred goals
 definition and examples of, 175–178, 176f, 176t
 guidelines for writing, 177–178, 183b
 summary for achievement of, 190–191
 Client-centred plan of care
 description of, 167, 182–184, 183b, 184f
 evaluation of, 194–195, 194f
 implementation of, 185
 Clients
 behaviour
 guidelines for charting, 207t
 hygiene assistance, 835–836, 836f, 841–873, 843b–850b, 852b–854b, 856b–860b, 862b, 863f
 lifting, 783–785, 786b, 786f, 786t
 within metaparadigm concepts, 56–58, 57f
 patient care flow sheets, 208, 210, 211f–212f, 213, 213b, 218f
versus patients, 57
 as source of health data, 156
 transport precautions, 811t
 Clinical care coordination
 by leadership and management, 133–135
 by practical nurses, 1380–1381, 1380f
 Clinical criteria
 for diagnosis, 165–168, 168t
 Clinical decision-making process
 and critical thinking, 141–142, 142t, 143b, 143f, 145–147
 critical thinking model, 141–142, 143b, 143f
 definition of, 145, 149b
 elements of, 142t
 for groups of patients, 147b
 research highlight, 149b
 techniques and competencies in, 142t, 144–148, 147b
 priority setting, 133, 174–175, 174f
 Clinical design support, 223
 Clinical inference, 145
 Clinical judgement, 56
 Clinical pathways
 care map, 210–213, 213b, 214f–217f
 preoperative patient teaching, 1341–1350, 1342f
 Clinical practice guidelines, 185
 Closed gloving, 652–659, 655b–657b
 Closed-ended questions, 159, 159b
Clostridium difficile, 620t–621t, 624, 635, 1168
 Closure of wounds, 1270
 Clubbing, 558b, 587–588
 Clubfoot, 1197t
 Clustering
 cues, 165–168, 168t, 170b
 errors, 170, 170b
 Coagulation studies
 measurement and normal values, 1337t
 Coalitions
 in community health nursing, 50–51
 within families, 284
 Coanalgesics, 1040
 Coccidioidomycosis, 891
 Code of Ethics
 Canadian Nurses Association (CNA), 44, 80–86, 82b–83b, 235–236
 caring as foundation of nursing, 262–263, 265, 270–271
 on client education, 292–293
 on communicable diseases and discrimination, 103
 on confidentiality, 235–237, 237b
 on discrimination, 110–111
 on end-of-life decision making, 455
 evolution of Canadian practical nursing, 1372, 1373t
 on the human act of caring, 265, 271
 International Council of Nurses (ICN), 83b
 purpose and values associated with, 80–82, 82b–83b
 ten rights of medication administration, 679b, 681–684
 Cognitions
 associated with normal grief, 454b
 Cognitive developmental theories
 focus of, 313
 Piaget's Theory of Cognitive Development, 313, 314t, 315f
 Cognitive domain
 of learning, 293–294, 293b, 302b
 questions to families, 285t
 Cognitive impairments
 and communication, 258, 259b
 in older adults, 382–384, 383b, 383t
 with sensory deprivation, 1304b
 teaching methods, 305
 urination problems, 1115
 Cognitive skills
 changes with aging, 381t, 382–384, 383b, 383t
 in critical thinking, 144–148, 149b
 development
 in infancy, 332–333
 in preschoolers, 341–344
 in school-age children, 346t–347t, 348
 in toddlers, 340
 in young adulthood, 362
 during implementation process, 188
 Cognitive stimulation
 in older adults, 392
 Cognitive-behavioural pain management, 1036
 Cold and heat applications, 1038
 Colitis, 1168
 Collaboration
 with family, 277–278, 278b
 for pain management, 1047b
 and partnerships in home health nursing, 45–46
 practical nursing, 1379
 problems, 163, 165f
 on research studies, 77t
 skills needed in community health nursing, 50
 Collaborative communication, 250
 Collaborative interventions, 178, 1047b
 Collaborative practice
 leadership and management of, 126–133, 128b, 130b, 132f, 135
 for pain management, 1047b
 Collaborative relationships
 in family nursing, 277–278, 278b
 Collagen, 1251–1253, 1251b, 1256, 1265–1266, 1271
 Collective bargaining, 102
 Colley, Kate Brighty, 43b
 Colloid osmotic pressure, 938, 939f
 Colloids, 958
 Colon; *See* also bowel elimination
 function and anatomy of, 1160f, 1162, 1162f
 Colon cancer, 545t–546t, 1169, 1171b
 Colonialism, 119–120
 Colonization, 619–620
 Colonoscopy, 1172b
 Colostomies
 irrigating, 1186–1187, 1187f, 1189b–1192b
 pouching, 1187–1188, 1188f, 1189b–1192b
 psychological and body image issues with, 1186
 types of, 1184–1185, 1186f, 1188f
 Colour
 feces, 1171t
 highlights to aid vision-impaired, 1318–1319
 perceptual changes with aging, 1304b, 1305–1306
 relaxation by exchange, 758b
 signs of tissue perfusion, 587–588
 Colour (*Continued*)
 skin, 829–831, 831b
 urine, 1123–1124
 wound and wound drainage, 1262t–1263t, 1264, 1265f, 1268–1269, 1269t
 Coma
 Glasgow Coma scale, 610, 610t
 Comfort
 and attention to client needs, 187, 188f
 communicating with touch, 255, 255f, 256b
 during dying process, 464t, 465
 patient's room environment, 866–873, 866f–867f
 postoperative assessment of, 1362, 1366
 post-surgery, 1351
 spirituality providing, 433–438, 434b, 437b
 therapeutic touch (*See* therapeutic touch)
 Commendations, 285–286
 Commitment
 component of human act of caring, 265, 266t
 to critical thinking, 143, 143f
 Common law, 95
 Common-law families, 274–275, 275b
 Communicable diseases
 description and types of, 619, 620t–621t
 legal issues with, 103
 Communication
 Aboriginal, 121
 with adolescents, 355
 authenticity in, 243
 challenges with patient, 244b
 in community health nursing, 50
 computer-mediated, 364–365
 contextual factors that influence, 251b
 cultural assessment of, 117t, 118
 definition of, 242–243
 developing skills in, 243–244
 elements of professional, 250–251
 assertiveness, 251
 autonomy and responsibility, 251
 courtesy, 250
 respect and dignity awareness, 250–252, 252b
 self-introduction and use of names, 250
 trustworthiness, 250–251
 emotional family, 283
 expressive functioning, 282–284
 with families, 273–274, 277–287, 283b, 285t, 286b
 forms of, 246–248
 nonverbal, 247–248
 verbal, 246–247
 with hearing impaired, 1319–1320, 1319b
 during implementation process, 188–190
 importance during delegation process, 133–135, 134b
 and interpersonal relationships, 243, 245, 245f, 251b
 levels of, 244–245
 interpersonal communication, 245, 245f, 251b
 intrapersonal communication, 244–245, 251b
 public communication, 245
 small-group communication, 245
 transpersonal communication, 245, 251b
 multidisciplinary, 203–204, 204f
 nontherapeutic communication techniques, 257–258
 of nursing interventions, 190
 with older adults, 250, 252, 252b, 378
 process elements and diagram, 245–246, 245f
 professional nursing relationship, 248–250
 questioning beyond the surface, 243
 sample analysis of, 260b
 seeking contextual knowledge, 244
 sensory deficits impairing, 1303, 1304b
 with special needs patients, 258, 259b
 staff, 133
 taking initiative in, 243
 therapeutic communication techniques, 254–257
 throughout nursing process, 244b, 251
 assessment, 251–253, 251b
 implementation, 253–258
 nursing diagnosis, 253
 planning, 253
 Community
 assessment, 51–52
 exercise and physical fitness promotion within, 776
 Community and Hospital Infection Control Association of Canada (CHICA-Canada), 646
 Community and voluntary agencies, 12, 25
 Community development, 12
 Community health centres/clinics (CHCs), 24–25
 Community health nursing practice
 challenges to, 46–52, 47b
 and empowerment, 44–46
 history and pioneers of, 42–43, 43b
 home health/community-based, 45–46, 51–52
 population health promotion approach, 45
 principles of, 44–46, 52
 promoting population and community group health, 44–45
 public health nursing, 44–45, 46f
 scope of, 44–46
 and social justice, 44
 standards, competencies and roles in, 50–51
 vulnerable populations, 45, 47–49, 48b, 48f
 Community sector delivery settings, 24–25
 Community-based nursing
 care plans, 182
 components of, 45
 in institutional settings for older adults, 377–378, 378b–379b
 scope of, 45–46
 Compassion
 component of human act of caring, 265, 266t
 ethical responsibility of nurses to care with, 82b
 origins of the word, 439
 in spiritual care, 443–444, 443f
 Competence/ competent care
 component of human act of caring, 265, 266t
 and delegation, 1380
 as ethical responsibility of nurses, 82b, 90–91
 legal issues with, 94–99, 98b, 101, 1037
 Competencies
 for critical thinking, 141, 142t, 144–149
 practical nursing in Canada, 1379–1380, 1381f, 1386
 for safe practices, 135–136, 136b
 for spiritual care, 438–441, 441b
 Competencies for safe practice, 135–136, 136b
 Complementary and alternative medicine (CAM)
 biofeedback, 753b, 753t–755t, 760–761
 biologically based therapies, 753b, 753t–755t
 categories and types of, 753b, 753t–755t
 definitions and types of, 752–755, 753b, 753t–755t
 for end-of-life care, 463–465
 energy therapies, 753b, 753t–755t, 761–762, 761f
 herbal therapy, 30, 752, 753b, 753t–755t, 763–766, 764t–766t, 767b, 1038
 holistic nursing, 752–760, 757b, 766–767, 1036–1039
 imagery or visualization, 759–760, 760b, 1036–1037
 manipulative and body-based therapies, 752f, 753b, 753t–755t
 meditation, 444b, 759, 759b, 1036–1037
 mind-body interventions, 753b, 753t–755t
 natural health products (NHPs), 763–766, 764t–766t, 767b
 relaxation therapy, 484–485, 757–759, 758b, 1036–1037, 1036b
 whole medical systems, 753b, 753t–755t
 Complementary proteins, 1052
 Complementary therapies
 definitions and types of, 752–755, 753b, 753t–755t
 for end-of-life care, 463–465
 Complete bed bath, 841–854, 843b–850b
 Complete blood cell count (CBC)
 hematology test, 1393t
 measurement and normal values, 1337t, 1388t–1389t, 1393t
 during respiration assessment, 515b–517b, 517, 895t
 serum, plasma and whole blood chemistry tests, 1388t–1389t
 Complex carbohydrates, 1052
 Complex critical thinking, 142–143, 143f
 Complex pain situations, 1362, 1364t–1365t

- Complexity science, 58
- Compliance
changes with aging, 892t
of lungs, 881
- Complicated grief, 450
- Comprehensive health history, 156,
157b–158b, 160
- Comprehensiveness
as principle of *Canadian Health Act of 1984*, 17–18, 18t
- Computed tomography (CT) scan
for bowel elimination problems, 1172b
of lungs, 896b
for urinary system imaging, 1128f,
1129t–1130t
- Computerized physician order entry
(CPOE), 223
- Computer-mediated communication,
364–365
- Computers; *See also* nursing informatics
Canadian Organization for
Advancement of Computers in
Health (COACH), 229, 239–240
and confidentiality, 97–98
documentation and reporting, 220–223
electronic health records (EHRs), 182
Concentration gradient, 938, 938f
Concentration of medications, 668–669,
668f, 669t
- Concentric tension, 772
- Concept maps; *See also* individual nursing
process cases
cerebrovascular accident, 802f
for critical thinking, 149
for dehydration, 957f
for depression following death, 461f
in diagnostic process, 168–169, 169f
documentation with, 210–213, 213b,
214f–217f
gastroenteritis, 957f
hygiene, 841–873, 841b–842b
myasthenia gravis, 1077f
for planning, 182–184, 184f, 187–188,
188f
for self-esteem improvement, 408, 410f
for sexual issues, 429, 429f
- Conception
intrauterine life, 327–328
- Concepts
defining in scientific theorizing, 54, 56t
Conceptual frameworks, 55–56, 56t–57t,
59
- Conceptual model for developing and
sustaining leadership, 126, 127f,
135–136
- Conceptualization
defining in scientific theorizing, 54, 56t
- Concrete operations, 311t, 348
- Condescending communication, 250–252
- Condom catheters, 1152, 1153b
- Condoms, 419–421, 422t
- Conduction
of heat, 492
- Conduction system
changes with aging, 892t
definition of heart, 879–880, 879f
disturbances, 884, 884b, 885t–886t
- Conductive hearing loss, 1304b
- Confession, 444b
- Confidence
component of human act of caring, 265,
266t
- Confidentiality
breaches, 97–98
ethical responsibility of nurses to
respect, 82b
and nursing informatics legislation,
235–237, 237b
- Personal Information Protection and
Electronic Documents Act (PIPEDA),
203, 236, 237b
- principles with documentation and
reporting, 203
- security mechanisms, 203, 222
- Confrontation, 257
- Congenital defects
postural abnormalities, 1196, 1197t
- Congenital hip dysplasia, 1197t
- Conjunctivae, 561
- Connotative meanings, 246
- Conscience
component of human act of caring, 265,
266t
- Conscious sedation, 1356–1357
- Consent forms, 99–100
- Consequentialism, 84
- Constipation, 1164–1165, 1172, 1173f,
1174b
- Constitution Act, 16–17
- Constrained moral agency, 84
- Consultations
documenting, 204, 204f
- Contact dermatitis, 830t
- Contact lenses, 700b–703b, 702f–703f, 835b,
863, 864b, 1316–1317
- Contact transmission, 621–622, 621t, 641t
- Contamination
chain of infection, 619–626, 619f,
620t–621t
and skin integrity, 1271–1272, 1272b
- Context
family, 277–278, 280–281
- Contextual factors
in nurse-family relationship, 274–278,
275b, 280–281
that influence communication, 251b
- Contextual knowledge, 244
- Contextual tradition, 321–322
- Bronfenbrenner's bioecological theory,
321–322, 322b
- Vygotsky's zones of proximal
development, 322
- Continence
fecal, 1174, 1175b, 1351
and skin integrity, 1259b
urinary, 1134–1135, 1134b–1135b
- Continent urinary diversion, 1119, 1119f
- Continuity of care, 253; *See also* individual
topics of care
definition and management of, 126–130,
127f
in grief and death situations, 461
as primary health care model, 21–22,
21f
in self-concept work, 408b–409b, 408f,
410–411
- Continuity theory, 376–377
- Continuous passive motion (CPM)
machine, 1219–1220, 1220f
- Continuous positive airway pressure
(CPAP), 998
- Contraception, 421, 422t
- Contracts and employment agreements,
102
- Controlled acts, 1382
- Controlled coughing, 1343b–1348b
- Controlled Drugs and Substances Act,
664–665
- Controlled substances, 664–665, 665b
- Convalescence, 1326, 1357
- Convection, 492
- Conventional stage, 314–315
- Coordination
clinical care, 133–135
in community health nursing, 51
motor skills, 613–614, 614b
- Coping
definition of, 473
spiritual framework illustration, 438f
- Coping behaviours
assessment of client's, 405–407,
406b–407b
- Coping mechanisms
addressed in *Achieving Health for All*, 4,
5f
as *Strategies for Population Health* health
determinant, 5
- Coping skills
addressed in *Achieving Health for All*, 4,
5f
aided by spirituality, 433–438, 438f
assessment of client's, 405–407, 407b
death and dying, 451–453, 459b–460b
as determinant of health, 5, 7–8
development of
adolescents, 346t–347t, 348–349
in school-age children, 346t–347t,
348–349
diagnoses regarding, 253
education to aid, 291
and family emotions, 286
with immobility, 1202, 1211–1212, 1212b,
1220–1221
during loss and grieving process,
451–453, 459b–460b
during pregnancy, 367, 368t
and self-concept (*See* self-concept)
of surgical patients, 1334–1335
- Cor pulmonale, 881
- Core temperature, 491, 491b, 491f
- Cornea, 561
- Corns, 832t
- Coronary arteries, 878, 878b, 878f
- Coronary heart disease (CHD)
benefits of exercise for, 774b, 786–787
ethnicity and gender variables in, 900b
factors affecting, 582b
heart failure, 781f, 884
- Coronary heart disease (CHD) (*Continued*)
lifestyle risk factors for, 888–889, 888b
myocardial infarction (MI), 879
in older adults, 380, 387–388
patient teaching, 900b
valvular, 884–886
and wellness activities during middle
adulthood, 370–372, 371b
- Corticosteroids, 1333t
- Cost accelerators, 26
- Costs
and trends in health care spending,
19–20
- Cough
assessment of sputum and, 890–891,
891b
for cardiopulmonary rehabilitation,
886
postoperative, 1343b–1348b
- Counselling techniques, 51, 189
- Courtesy, 250
- Crab lice, 834t
- Crackles, 577, 578t
- Creative visualization, 760, 760b
- Credentiaing, 1375, 1383
- Creelman, Lyle Morrison, 110b
- "Creeping credentialism", 1372, 1376
- Creutzfeldt-Jakob (CJD), 383–384
- Criminal liability, 99, 1383
- Crises
developmental versus situational,
473–474
interventions, 486
trauma, 476–477, 476b
- Critical pathways
documenting variances, 213, 213b,
214f–217f
for interventions, 182
nursing information system design of,
222
plan, 210–213, 213b, 214f–217f
- Critical thinking, 140–152
during assessment process, 154–155,
155f
attitudes, 147–148
and clinical decision-making process,
141–142, 142t, 143b, 143f, 145–147
critical thinking model, 141–142, 143b,
143f
definition of, 145, 149b
elements of, 142t
for groups of patients, 147b
research highlight, 149b
techniques and competencies in, 142t,
144–148, 147b
clinical inference, 145
and clinical judgement, 56
competencies, 141, 142t, 144–149
components of, 143–144, 143b
concept maps, 149
definition of, 141
developing skill for, 148–149
diagnostic reasoning, 145–146
during evaluation process, 148, 194–195,
194f–195f
and evidence-informed knowledge, 141,
143f
in implementation process, 185, 186f
Kataoka-Yahiro and Saylor models,
142–148, 143f
learning and experience as basis for,
140–141, 143–144, 143b, 143f
levels of, 142–143, 143f
during nursing diagnosis process,
162–168, 163f
within nursing process framework, 142,
143f, 147, 147f, 149–150, 149b, 150f
during planning process, 175–178,
175f–176f, 176t–177t
problem solving, 145
reflective journal writing, 148–149
scientific method, 144–145
skills and dispositions needed for, 141,
142t, 148–149
standards, 148, 155, 155f
synthesis, 149–150, 150f
- Critical thinking models; *See* individual
chapters/topics
- Crittenden, Patricia, 319–320
- Crowe, Cathy, 11–12, 11b, 47
- Crutch gait, 1244–1245, 1245f–1247f
- Crutches, 1243–1246, 1244b, 1244f–1247f
- Crystalloids, 958
- Cuff, 524–529, 524b–528b, 525f–526f, 528f,
529t, 531f
- Cultural assessments
of Aboriginal peoples, 119–123
description and methods, 114–119,
114b–115b, 117t
- Cultural awareness
and communication, 247–248, 251b,
252
versus cultural sensitivity, 113–114, 114f
definition of, 112–114
self-assessment questions, 114–116,
114b–115b
- Cultural competence
regarding Aboriginal peoples, 16–19,
120–123, 122b
ACCESS model, 112
awareness with vulnerable populations,
44–46, 48b
challenges in Canadian health care, 26
evolution of Canadian nursing, 111–114
during physical assessments, 538
process of, 112, 112f
regarding touch, 269
- Cultural considerations
in hygiene practices, 828, 828b, 836
regarding pain, 1025–1026, 1026b
stress responses, 478, 479b
with urinary elimination, 1120
- Cultural diversity
awareness during client education, 305
in Canada, 109–110, 109f, 434
and spirituality, 434, 434b
- Cultural identity
self-concept influenced by, 398, 399b
and values, 81
- Cultural imposition, 111
- Cultural pluralism, 111
- Cultural relativism, 111
- Cultural safety, 113–114, 113b, 114f, 122
- Cultural sensitivity
and caring, 264, 264b
versus cultural awareness, 113–114, 114f
- Cultural values, 81
- Culturally competent care, 112, 112f, 115f
- Culturally congruent care, 112, 115f
- Culture care theory, 114–116, 115f
- Culture of safety, 678–679
- Cultures
Aboriginal, 119–123, 310b, 312f (*See also*
Aboriginal peoples)
belief variances
blood transfusions, 986, 986b
body image, 399
death and dying, 117t, 118, 452, 452b,
456t
gender roles, 362
hygiene practices, 828, 828b, 836
menopause, 372b
pain, 1025–1026, 1026b
postmortem care, 467–469, 468b
sexuality, 422–423
spirituality, 434, 434b
stress responses, 478, 479b
urinary elimination, 1120
conflicts, 111
definition of, 110–111
as determinant of health, 5, 10
diversity in Canada, 109–110, 109f, 434
ethnography studies, 75–76
and gender roles in young adults, 362
and heart disease, 900b
historical development of concept of,
111–114
as *Strategies for Population Health Report*
determinant, 5
trends in nursing profession, 34, 37
verbal and nonverbal communication
awareness, 247–248, 251b, 252
visible versus invisible, 110
Curanderismo medical system, 753t–755t
- Cutaneous reflexes, 614–615, 615t
- Cutaneous stimulation, 1037–1038
- Cuticles, 826–827, 827f
- Cyanosis, 550–551, 587–588, 588t, 831b,
887, 892–893, 893t, 1259b
- Cystitis, 1117
- Cystometrogram, 1129t–1130t
- D
Dairy
Eating Well with Canada's Food Guide
recommendations, 1056
lactose intolerance, 1066b, 1164
- Dance therapy, 752f, 753t–755t
- Dandruff, 834t
- Darkly pigmented skin
as pressure ulcer warning sign, 1252,
1253b–1255b, 1253f
- Dark-skinned patients, 551, 831b
- Data
clustering and patterns, 165–168, 168t
defining characteristics, 165–168, 168t
quantitative versus qualitative, 74–77
validation, 161

- Data analysis
errors in, 170, 170b
in quantitative nursing research, 75
steps of, 161, 161b
- Data collection
branching questions/logic, 156f
comprehensive health history, 156,
157b–158b, 160
cues *versus* inferences, 155–156, 156f
diagnostic and laboratory, 160–161 (*See also* Appendix B)
errors, 170, 170b
during evaluation process, 196–197, 198t
family history, 160
interviews, 158–160, 159b
methods of, 158–160
observation of behaviours, 160
from patient records, 206
physical examination, 160–161
sources, 156–158
subjective *versus* objective data, 156
- Data validation, 161
- Data-action-response (DAR) notes, 209,
209b
- Databases; *See also* data; data collection
creation during assessment process, 154
scientific literature, 67–68, 68b
section in problem-oriented medical
record, 208–209
- Death and dying
accidental or violence-related young
adult, 365
communicating with dying patient,
256b, 462
critical thinking model, 453, 453f, 459f
cultural, ethnic and spiritual beliefs
regarding, 117t, 118, 452, 452b, 456t
Dying Person's Bill of Rights, 453, 453b
end-of-life care, 455–457, 457b, 461–469,
464t, 466b, 469b
grief process theories
Bowlby's Four Phases of Mourning,
449–450, 449t
Kübler-Ross's Five Stages of Grief,
449, 449t
Worden's Four Tasks of Mourning,
449t, 450
legal issues with, 103–104
mourning and adapting to loss, 448–449,
448t
nurse's personal experience with, 457,
469, 469f
nursing process application to
assessment, 453–458, 456t, 458b–460b
evaluation, 469–470, 470f
implementation and interventions,
461–469, 464t
nursing diagnosis, 458, 458b–460b
planning, 458–461, 459b–460b, 459f
nutrition withdrawal in futile situations,
90
older adults coping with, 377, 377b
- Debridement, 1277–1280
- Decentralized/participatory management,
131, 131t
- Decision making
competency in nursing, 130–133, 131f
evidence-informed, 66, 66b, 70, 78, 133
leadership and management, 130–133,
130b, 131t, 132b
models for ethical, 86–90, 87b
staff mix, 132b
types identified by nursing students,
149b
- Deconditioning, 1196
- Decubitus ulcers; *See* pressure ulcers
- Deep breathing exercises
for cardiopulmonary rehabilitation, 933
postsurgical, 1343b–1348b, 1344f
- Deep pain, 1022, 1022t, 1029t
- Deep tendon reflexes, 614–615, 614f–615f,
615t
- Deep tissue injuries, 1262t–1263t, 1263b
- Deep vein thrombosis (DVT)
bathing precautions with, 843b–850b
postoperative, 1343b–1348b
preventing in immobile patients, 1211,
1217–1219, 1218b–1219b
- Defecation; *See also* bowel elimination
bedpan procedure for, 1163–1164, 1164f
correct positioning for, 1163, 1163f
description of, 1162
process of, 1163–1165
- Defence mechanisms
assessment of status, 627, 627b
body system defences, 623, 623t
immune response, 622–624
against infections, 620t, 622–624, 623t,
627, 627b
- Defence mechanisms (*Continued*)
inflammatory response, 623–624, 623t
normal flora, 622–623
Defensive responses, 258
- Deficient knowledge
diagnosis of, 174, 177t
example of, 176t
- Defining characteristics
of data, 165–168, 168t
- Dehiscence
definition and illustration of wound,
1271, 1272f
postoperative, 1330–1332, 1361–1362,
1364t–1365t
- Dehydration
concept map, 957f
fluid intake and thirst, 940f, 944t
nursing process example of, 947–990,
948b, 954b, 955f, 956b–957b, 957f
in older adults, 379–380, 392, 948b
and oral problems, 837t
as skin impairment risk factor, 831b
skin problems due to, 831b
- Delayed grief, 450
- Delegation
five rights of, 133–135, 134b, 1380
during implementation process, 187,
190
practical nursing, 1380, 1381f
and scope of practice, 133–135, 134b
tips for effective, 134–135
- Delirium
in acute care setting, 392
clinical features *versus* dementia and
depression, 382–384, 383t
criteria for, 609–610, 610b
in older adults, 382–383, 383b, 383t
Deltoid muscle injections, 732b, 733, 733f
- Dementia
Alzheimer's disease, 383–384, 391b,
842b, 1115
bathing patients with, 842b
caregivers and hope, 76b
clinical features *versus* depression and
delirium, 382–384, 383t
nutritional needs for clients with, 389
in older adults, 383–384, 383t
therapeutic touch for clients with,
391–392, 391b
- Demographic statistics
of Aboriginal groups, 109–110, 119–123
and cultural assessment, 109–110, 109f,
115–116, 117t
French-speaking population, 109–110
affecting health care costs, 26
- Denial stage of grief, 449–450, 449t
- Denotative meanings, 246
- Dental health
children, 348, 351t, 835
early childhood tooth decay (ECTD),
1060
health risks with hygiene problems, 837t
mouth assessment, 568–570, 568t, 571t
older adult, 389, 835
oral hygiene procedures and goals, 827,
827f, 835, 854–861, 855b–860b
tooth eruption
in infancy, 337, 835
of permanent teeth, 348, 835
young and middle-aged adult,
1062–1063
- Dentition
and tooth eruption in infancy, 337
- Dentures, 854–861, 855b–860b
- Deontology, 84
- Dependent nursing interventions, 178
- Depression
in adolescents, 346t–347t, 348–349,
353t–354t, 356, 357b
clinical features *versus* dementia and
delirium, 382–384, 383t
due to sexual problems, 427–430,
427b–428b, 429f
with immobility, 1202, 1211–1212, 1212b,
1220–1221
during middle adulthood, 371
nutrition deficits due to, 1075b–1076b
in older adults, 383t, 384
postpartum, 368t, 403
affecting sleep, 995, 1005
spirituality positively benefiting,
434–435, 437b
stage of grief, 449–450, 449t
- Dermatitis, 552
- Dermatomes, 611–613, 612f, 613t
- Dermis, 827, 827f, 1251–1253, 1251f,
1262t–1263t
- Descriptive moral theory, 84
- Descriptive survey designs, 75
- Descriptive theory, 56, 57t
- Descriptors
for diagnoses, 166–167
- Despair
versus hope, 254, 452–453, 456t, 462
versus integrity, 318t, 321t, 398b
- Determinants of health
Epp Report, 4, 5f
health promotion to influence, 10–11
Lalonde Report, 3–4, 6f
overview of
age, 5, 8
birth weight, 5, 7
coping skills, 5, 7–8
culture, 5, 10
education, 5, 7
employment, 5, 7–8
environment, 5, 8
exercise habits, 5, 8–9
gender, 5, 9–10
genetics, 5, 8
health services, 5, 9
healthy child development, 5, 9
income, 5, 7
inequities, 5, 7
literacy, 5, 7
nutrition, 5, 8–9
physical inactivity, 5, 8
physical environment, 5, 8–9
poverty, 5, 7
psychosocial stress, 5, 7
sedentary lifestyle, 5, 8–9
social environments, 5, 10
social status, 5, 7
social support networks, 5, 7
stress, 5, 7–9
tobacco use, 9, 887–889
working conditions, 5, 7–8
social determinants of, 6
Strategies for population health, 5
strategies to influence, 10–11
- Detoxify, 666–667
- Detrusor muscle, 1115
- Development
definition of, 310
- Developmental assessment
Calgary Family Assessment Model
(CFAM), 279f, 282
in Calgary Family Assessment Model
(CFAM), 279f, 282
during health history assessment,
157b–158b
- Developmental behaviours
adolescents, 346t–347t
infants, 332–333, 334b–335b, 335
preschoolers, 327b, 341–345, 346t–347t
school-age children, 327b, 346t–347t
toddlers, 327b, 339–341, 346t–347t
- Developmental crises, 473–474
- Developmental health, 322, 323f
- Developmental tasks
with immobility, 1202, 1212, 1221
for older adults, 377, 377b
- Developmental theories
biophysical, 311–313
Chess and Thomas Theory of
Temperament Development,
312–313
Gesell's Theory of Maturation
Development, 312
cognitive developmental theories, 313
Piaget's Theory of Cognitive
Development, 313, 314t, 315f
contextual tradition, 321–322
Bronfenbrenner's bioecological theory,
321–322, 322b
Vygotsky's zones of proximal
development, 322
cultural and Aboriginal considerations,
310b, 312f
dialectic tradition, 322–323
Keating-Hertzman's population
health approach, 322–323
mechanisms of development, 310
mechanistic tradition, 321
moral development theories
Gilligan's Theory, 315
Kohlberg's Theory of Moral
Development, 315, 316t
Piaget's Theory of Moral
Development, 314–315, 314t
and nursing, 310, 323–324
organicism, 311–315
psychoanalytic and psychosocial
theories
Bowlby's attachment and separation
theory, 319, 319b
Dynamic Maturational Model of
Attachment, 320, 320b
- Developmental theories (*Continued*)
Erikson's Theory of Eight Stages of
Life, 317–319, 319f, 321t
Havighurst's Developmental tasks,
320–321, 321t
Sigmund Freud's psychoanalytic
model of personality
development, 315–317, 317t
traditions of, 310
- Diabetes mellitus
benefits of exercise for, 774b, 776b, 787
bowel elimination problems due to,
1168
insulin preparation and injection,
719–720, 720b–727b, 720t
recommended screenings according to
age, 545t–546t
trends in Canada, 1051
ulcers and neuropathy, 831, 1267–1268,
1267f
- Diabetic retinopathy, 1303, 1304b
- Diabetic ulcers, 1267–1268, 1267f
- Diagnoses; *See* nursing diagnosis
- Diagnostic data, 160–161
- Diagnostic error sources, 169–170, 170b
- Diagnostic labels, 166–167, 167t, 170b
- Diagnostic reasoning
in critical thinking, 145–146
in nursing diagnosis process, 165–168,
167f, 168t
- Diagnostic tests; *See also* Appendix B;
laboratory tests
during cardiopulmonary assessment,
893, 894t–895t, 896b
data, 160–161
- Dialectic tradition, 322–323
Keating-Hertzman's population health
approach, 322–323
- Dialysis, 1115–1116, 1116b
- Diaphoresis, 492
- Diaphragm
movement during breathing, 513–514,
514f, 933
of stethoscope, 506–511, 511f–512f
- Diaphragmatic breathing, 933
- Diarrhea
description and causes of, 791, 808–809,
1167–1168, 1174, 1179
food poisoning, 791, 808–809
upsetting fluid and electrolyte balance,
1174, 1176, 1179
- Diastole, 579–581, 580f, 878–879
- Diastolic blood pressure, 490b–491b, 491f,
521–533, 522t, 524b–528b, 529t
- Diet
Eating Well with Canada's Food Guide,
1056–1058, 1057f, 1058t
as fluid, electrolyte, and acid-base
imbalance risk factor, 947b, 949
obtaining dietary history (Acronym:
FASTCHECK), 1069, 1070t
- Dietary guidelines, 1056–1059, 1057f,
1058t
- Dietary reference intakes (DRIs),
1056–1059, 1057f, 1058t
- Dietary supplements, 753b, 753t–755t
- Difference questions, 285t
- Differentiation, 312, 327–328
- Diffusion
body fluid, 938, 938f
respiration, 513–521, 880–882
- Digestive system
anatomy and physiology of, 1053–1056,
1054f
description and organs of, 1053–1056,
1054f, 1160–1162, 1160f–1161f
- Dignity
awareness during communication, 243,
250–252, 252b, 274
and caring in end-of-life care, 264, 463,
465
and end-of-life decision making, 455
ethical responsibility of nurses to
respect, 82b–83b, 83–84, 459–460
relational ethics theory, 86
and respecting religions and faith,
440–441
treating older adults with, 376
- Direct care interventions, 185, 189–190
- Disabilities
Epp Report on, 4, 5f
long-term care (LTC) facilities for, 23
sexuality in persons with, 425
vulnerable populations due to, 45,
47–49, 48b
- Discharge planning
guidelines for charting, 207t
prioritizing and goal setting, 174–175,
191

- Discharge summary
documentation, 204, 210t, 219–220, 219b, 221f
information and forms, 214f–217f, 219–220, 219b
- Discovery, 96b
- Discrimination
ageism, 376
CNA's *Code of Ethics* on, 111
definition of, 111
against older adults, 257
against religions or faiths, 440–441
- Disease
definition of, 2–3, 263
historical evolution of treating, 3–6, 30
relationship with health and illness, 2f
spirituality aiding coping with, 433–438, 438f
- Disease prevention
defining process of, 10–11
- Disenfranchised grief, 450
- Disengagement theory, 376–377
- Disinfection; *See also* infection control
categories and prioritizing, 633b
and sterilization, 633–634, 633b, 634t
- Disorganization and despair phase, 449–450, 449t
- Disparities
Epp Report on, 4, 5f
strategies to narrow health, 6
- Distractions, 1037
- Distress
defining, 476
psychological, 477, 478b
signs during physical exam, 547
symptom, 463–465
- Distribution
aging effects on medication, 688–690, 690b, 691f
body fluid, 937, 937t
in pharmacokinetics, 666
systems for medication stocking and dispensing, 677–678
- Disuse atrophy, 1200, 1211
- Disuse osteoporosis, 1200, 1211
- Disuse syndrome, 1212–1213
- Diuresis, 1116
- Diuretics
effects during surgery, 1333t
as fluid, electrolyte, and acid-base imbalance risk factor, 947–949, 947b, 949b
interacting with nutrients, 1064t
names and hypertensive actions of, 522t
sleep affected by, 1001b
- Diurnal polyuria, 1118
- Diversional activities
of adolescents, 346t–347t
of school-age children, 345, 346t–347t
- Diversity
within Aboriginal population, 119–120, 122–123
awareness in Canadian health care system, 26
awareness with vulnerable populations, 44–46, 48b
and cultural safety, 113–114, 113b, 114f
and multiculturalism in Canada, 109–110, 109f
of older adult population in Canada, 375
trends in nursing profession, 34, 37
- Divorce, 274
- Dizziness
and balance, 1196
helping fainting patient, 1242, 1242f
in older adults, 379–380, 379b
“Do not resuscitate” (DNR) orders, 102
- Documentation and reporting
of assessment data, 162
charting
abbreviations, symbols and acronyms, 206–207
common errors in, 204, 205t, 206–207
description and purposes of, 203–204
error prevention, 206–208
example of standardized form, 211f–212f
legal guidelines for, 204, 205t
quality and accuracy, 206–208
sample narrative notes, 210b
security mechanisms, 203, 222
SOAP or SOAPIE, 209, 209b
traditional types and criteria, 207t, 208–213, 210t
of client education, 306
of client responses, 190
complete and current, 207–208
- Documentation and reporting (*Continued*)
computerized, 220–223
confidentiality principles, 203
definition of, 202–203
discharge summary, 219–220, 219b, 221f
electronic health records (EHRs), 182, 220–223
elements of high quality, 206–208, 207t
of end-of-life care, 468, 469b
during ethical dilemma process, 87
during evaluation process, 198
factual and accurate, 206–207
home health care, 220, 220b
importance of timely and truthful, 98b, 99, 206–208
informed consent, 99–100
of intraoperative care, 1357
legal guidelines, 204, 205t
long-term health care, 220, 220b
medication, 683, 687–688, 688b, 689f
and multidisciplinary communication, 203–204, 204f
organized and compliant with standards, 208
Personal Information Protection and Electronic Documents Act, 203
record-keeping forms, 211f–212f, 213–220, 214f–218f, 220b, 221f
reporting, 223–226
change-of-shift reports, 223–225, 224t
identification-situation-background-assessment-recommendation-repeat back (I-SBAR-R) technique, 223–226, 224b
incident reports, 225–226
situation-background-assessment-recommendation (SBAR) technique, 223–226, 224b
telephone orders (TOs) or reports, 225, 225b
transfer of accountability (TOA) guidelines, 223–224
transfer reports, 225
verbal orders (VOs), 225, 225b
for risk management, 105
surgical, 1352
systems for
case management plan, 210–213, 213b, 214f–217f
charting by exception (CBE), 210, 211f–212f
concept maps, 210–213, 213b, 214f–217f
critical pathways plan, 210–213, 213b, 214f–217f
narrative documentation, 208, 210b
problem-oriented medical records, 208–209
progress notes, 209, 209b–210b, 210t
source records, 209–210
- Domestic roles
trends in Canadian families, 275
- Domestic violence, 426, 547b–548b, 548
- Donner-Wheeler Career Planning and Development Model, 136–137, 136f
- Dorsal kyphosis, 380, 381t
- Dorsal rhizotomy, 1043
- Dorsalis pedis artery and pulse, 507t, 586, 587f–588f
- Dorsiflexion, 1203, 1204t–1208t
- Dorsogluteal muscle injections, 732–733
- Dosages
administration schedule and abbreviations, 669t
and concentration of medications, 668–669, 668f
measuring liquid, 688, 693b–697b, 695f
Double ureterostomy, 1119, 1119f
Double-barrel colostomy, 1185, 1186f
“Dowager’s hump”, 380, 381t
Dr. Peter Centre, 50b
- Drainage (wound)
characteristics, 1268–1269, 1269t, 1270f
evacuators, 1294, 1294f
types of, 1269–1270, 1269t, 1270f
- Drapes, 650b–651b
- Dreams, 995
- Dressings
changing intravenous (IV) therapy, 983, 983b–984b
securing, 1289–1290
wound, 1274b, 1280–1290, 1281b–1285b, 1284f, 1286t, 1290f
- Dribbling, 1121t
- Droplet transmission, 621–622, 621t, 641t
- Drowning
prevention of
children and adolescents, 803t–804t
infancy, 333, 334b–335b
- Drowning (*Continued*)
school-age children, 350t
toddlers and preschoolers, 340–341, 342t–343t
- Drug abuse
adolescent, 356–357, 358t, 365
as coping mechanism, 406–407
narcotics regulations, 102–103
in school-age children, 350t–351t
signs on skin, 552, 552t
affecting sleep, 996–998, 997b, 1001, 1001b
in young adults, 364–365
- Drug administration; *See* medication administration
- Drug compliance, 687b
- Drug therapy
changes and infections in older adults, 624–627, 626b, 628t
compromising immune system, 627–628
and Hendrich II Fall Risk Model, 798, 798t
- Drug tolerance, 1046b
- Drugs; *See also* medications
compliance, 687b
legal issues with administering, 102–103
names, 663
standards, 664–665
- Dry eyes, 1304b
- Dry mouth, 837t, 1304b
- Dry skin, 830t
- Dry suction chest drainage system, 920, 924f
- Dry wound dressings, 1281–1288, 1282b–1285b
- Due process, 95
- Duodenum, 1161–1162
- Dying patients; *See* death and dying
- Dying Person’s Bill of Rights, 453, 453b
- Dynamic Maturation Model of Attachment, 320, 320b
- Dynorphins, 1018b
- D’Youville, Marguerite, 31, 37, 434
- Dysarthria, 258, 259b
- Dyspareunia, 417, 427–429
- Dysphagia, 1054
- Dyspnea, 890, 901
- Dysrhythmias
auscultation to detect, 581
causes and severity levels of, 884
description of, 513, 884, 884b, 885t–886t
types of common, 885t–886t
- Dysuria, 1117, 1121t
- E
Ear canals, 564f–565f
Eardrums, 564f–565f
- Early childhood
age period defining, 327b
- Early childhood tooth decay (ECTD), 1060
- Ears
anatomy and physiology of, 564f, 1302t
auricle anatomical structures, 565f
changes with aging, 381–382, 381t, 835, 1305–1306, 1305b
characteristics of normal, 1302–1305, 1302t
hygiene, 827, 833, 864–865
medication administration, 671, 704–705, 704b, 704f
physical assessment of, 563–565, 564b, 564f–565f, 564t, 566t–567t, 1308, 1309t
recommended screenings according to age, 545t–546t, 1315
- Eating disorders, 357, 1061, 1063t
- Eccentric tension, 772
- Echinacea, 764t–765t
- Ecological theory, 1374–1375
- Ecomaps, 274–275, 282f
- Economic status
and access to care, 22b, 26
addressed in *Achieving Health for All*, 4, 5f
changes in families, 275
as determinant of health, 5, 7
nutrition and, 1051, 1077–1078
poverty (*See* poverty)
as *Strategies for Population Health* health determinant, 5
vulnerable populations due to, 45, 47–49, 48b
- Ectropion, 560–562
- Eczema, 552
- Edema
and cardiopulmonary status, 893t
cerebral from head injury, 949, 951t–952t
description and assessment of, 553, 588t, 589f
- Edema (*Continued*)
immobility and, 1211
inflammation causing, 624
with venous insufficiency, 587–588, 589f
with wound infection, 1257b
- Education
baccalaureate entry-to-practice, 37–38
of clients (*See* client education; client teaching)
CNA School Improvement Program, 38
continuous learning environment, 133
as determinant of health, 5, 7
economic, social and military upheavals influencing, 38–40
Edith Kathleen Russell’s role in nursing, 43b
evolution of Canadian practical nursing, 1372–1373, 1373t
from Great Depression to post-World War II years, 39–40
history of Canadian nursing schools, 34–40, 35b–36b
laddering, 1376
levels and communication, 246–247, 251b
nursing, 34–40, 35b
and nursing registration, 95
nursing research, 71–73, 72b
Royal Commission on Health Services, 37–38
Strategies for Population Health Report on, 5
trends and issues, 1375–1378
continuing education, laddering, and postgraduate issues, 1376
educational requirements and programs, 1375–1376
entry-to-practice requirements, 1376
university nursing history, 37–40
Edwin Smith Papyrus, 30
EENT assessment, 557–559
Effluent stool, 1186–1188, 1187f
Ego, 316–319, 398b
E-health, 26, 231, 237–239
Elastic antiembolism stockings, 1217–1219, 1219b, 1356–1357, 1360–1361, 1365–1366
- Elbow
joint movement, 1204t–1208t, 1241
- Elder abuse
community health nursing awareness of, 47–48
red flags and awareness, 385, 386b, 547b–548b, 548
types of, 385, 386b
- Elderly; *See* older adults
- “Elderspeak”, 243, 250–252
- Electrical fire hazards, 797b, 819–820, 820b
- Electrical outlet covers, 803f
- Electrocardiogram (ECG), 880, 880f
- Electrolytes; *See also* fluid, electrolyte, and acid-base balances
concentration in extracellular fluids, 937t
definition and functions of, 937
imbalance with diarrhea, 1174, 1176, 1179
imbalances, 1334–1335
measurement and normal values, 937t, 1337t
regulation of, 1330
- Electronic blood pressure measuring devices, 532b
- Electronic community of practice (eCOP), 238b
- Electronic health records (EHRs)
for care plans, 182
challenges and advances in, 26, 229, 231
documentation and reporting, 204, 220–223
jurisdictional progress chart, 232f
Personal Information Protection and Electronic Documents Act (PIPEDA), 203, 236, 237b
six core components of, 231
- Electronic measuring devices, 532b
- Electronic thermometers, 495b–499b, 501–502, 501f
- Elemental formulas, 1087–1100
- Elevated postvoid residual urine, 1121t
- Emancipatory knowing, 70t, 71, 278b
- Embodiment
in relational ethics, 86
- Embolus
with immobilization, 1199, 1200f, 1211
postoperative, 1330–1332, 1364t–1365t
- Embryo, 327
- Emergency plans
legislation regarding, 18, 18t

- Emotional abuse
nursing responsibilities and awareness of, 47-48
- Emotional health
adolescents, 346t-347t, 348-349, 353t-354t, 356, 357b
emotional families, 283, 286
young adults, 362, 364, 364b
- Emotional status, 609-611, 609t, 610b
- Emotional stress
causing sleep deprivation, 999, 999b, 1002
- Emotions
acknowledging patient, 255
affected by sensory alterations, 1304b, 1308
assessment during physical exam, 547
associated with normal grief, 454b
affecting capacity to learn, 294
emotional families, 283, 286
influencing pulse rates, 512t, 513
influencing urination, 1117
affecting physical activity tolerance, 779b
affecting sleep, 999, 999b, 1002
- Empathy
importance of communicating with, 254, 256b
versus sympathy, 257
- Empirical data, 74
- Empirics, 70, 70t
- Employment
career development
for nursing students, 136-137, 136f
as determinant of health, 5, 7-8
as *Strategies for Population Health Report* determinant, 5
- Empowerment
aspect of health, 3
aspect of health in *Ottawa Charter*, 4, 5f
and community health nursing, 44-46
and partnerships in home health nursing, 46
- "Empty-nest" syndrome, 370
- Enculturation, 111
- End colostomy, 1185, 1186f
- Endocrine system
changes with aging, 381t
- End-of-life care
communicating with dying patient, 256b
cultural, ethnic and spiritual beliefs regarding, 452, 452b, 456t
death and dying, 455-457, 457b, 461-469, 464t, 466b, 469b
decisions, 455-457, 457b
documentation, 468, 469b
family perception of, 455-456, 457b
importance of nurses in, 455-457, 457b, 461-469, 464t, 466b, 469b
pain management, 1046
- Endogenous infections, 624
- Endometrial cancer, 545t-546t, 598t, 600b
- Endorphins, 475, 1018b
- Endoscopy, 1129t-1130t, 1170t
- Endotracheal (ET) tube, 905b-911b, 910f, 912, 913b-919b, 915f-916f
- End-stage renal disease, 1115, 1116b
- Enemas, 1179-1181, 1182b-1184b, 1351
- Energy flow
and therapeutic touch, 761
- Energy therapies, 753b, 753t-755t
- Engagement
in relational ethics, 86
- Enteral feedings/nutrition
bowel elimination problems with, 1168-1169
complications, 1099-1100, 1101b, 1103t-1104t
feeding procedures, 1088b-1096b
gastrostomy or jejunostomy tube administration, 1097b-1099b
for immobile patients, 1216-1217
indications for, 1088b
nasogastric tubes, 1088b-1096b, 1100f
obtaining gastrointestinal aspirate for pH testing, 1101b-1102b
small bore tubes, 1088b-1092b, 1100f
tube feeding procedures, 1082-1100, 1088b-1100b
- Enterostomal therapist (ET), 1187
- Entropion, 560-562
- Entrusting teaching approach, 302
- Eucleation, 835b, 864, 864f
- E-Nursing Strategy for Canada, 237-239
- Environment
and cardiopulmonary functioning, 889, 891
creating supportive, 12
- Environment (Continued)
as determinant of health, 5, 8
ecological factors in practical nursing, 1374-1375
for effective communication, 245f, 246, 251b
family questions regarding, 281
as fluid, electrolyte, and acid-base imbalance risk factor, 947-949, 947b
growth and development influenced by, 311t, 312-313
hazardous, 48
health risks due to, 365
healthy practice, 126, 128b
learning, 133, 294
within metaparadigm concepts, 56-58, 57f
patient's room, 866-873, 866f
for physical examination, 542
pollution, 792, 820
providing peaceful end-of-life, 464t, 465
and relational ethics, 86
safe and clean (See infection control)
safety goals, 187, 188f, 790-793, 797-798, 797b, 808-810, 820
sensory stimuli, 1306
temperatures, 493
tips for older adults, 386-387
- Environmental health
legislation regarding, 18, 18t
- Enzymes, 1053-1054, 1161
- Epidemiology, 646, 1385
- Epidermis, 826-827, 826t, 1251-1253, 1251f, 1262t-1263t
- Epidural analgesia, 1042-1043, 1042f, 1043t, 1356
- Epidural medications, 670-671, 670t, 671f
- Epidural space, 1042, 1042f, 1043t, 1356
- Epigenesis, 317-319
- Epiglottitis, 1054, 1160, 1161f
- Epithelialization, 1265-1266
- Epp Report, 4, 5f
- Equality
Epp Report, 4, 5f
and quality challenges in Canadian health care, 26-27
women's social equality struggles, 38-40, 71
- Equipment
personal protective equipment, 641b-643b, 641t, 644-645, 645b, 649, 652b-657b, 659
for physical assessments, 542, 542f, 543b
safe use of nursing, 187
- Equity
global health, 108, 108t
- Erasure, 362
- Erectile dysfunction, 424, 424t
- Ergonomics
for safe transfer and positioning, 769-770, 783-785, 786b, 786f, 786t
- Erikson's developmental tasks
self-concept, 397-403, 398b
- Erikson's Theory of Eight Stages of Life, 317-319, 319f, 321t, 369
- Errors
adverse events, 90, 96, 98-99, 98b, 105, 169-170, 170b, 225-226, 794
Canadian ranking in medical, 19
charting, 204, 205t
diagnostic error sources, 169-170, 170b
ethics of admitting, 90
medication (See medication errors)
nursing recognition of possible, 178, 178t
- Erythema, 551-552, 552t
- Erythrocyte sedimentation rate (ESR), 629t, 1393t
- Erythropoietin, 1113
- Escherichia coli*, 620t-621t, 1079t, 1117, 1201
- Esophagus
digestive role of, 1054, 1054f, 1160, 1160f-1161f
- Essential amino acids, 1052
- Essential fatty acids (EFAs), 753t-755t
- Esthetics, 70, 70t
- Estimated average requirements (EARs), 1056
- Estrogen, 352
- "Ethic of care", 267-268
- Ethical dilemmas
analyzing, 86-88, 86b
case study, 87-88
description of, 86
models for decision making, 86-88, 87b
- Ethical spiritual care, 440-441, 440b
- Ethical theory, 84-86
- Ethics
accountability, 82b-83b, 83
advance directives, 89-90
regarding adverse events, 90-91
as basis of caring, 266
Code of Ethics, 44, 80-86, 82b-83b
definition of, 80-86
and dilemmas forming knowledge, 70t, 71, 91b
ethical spiritual care, 440-441, 440b
ethical theory, 84-86
futile care, 89-90, 89f
informed consent, 88-90
nursing practice issues, 88-91
and pain relief, 1018, 1022-1026
patient care issues, 88-90
practical nursing in Canada, 1378
principles guiding research, 77-78, 77b
and spiritual care, 440-441
theories and principles of
applied ethics, 84
autonomy, 83-85
beneficence, 85
bioethics, 84-85
biomedical ethics, 84-85
care theory, 86
consequentialism, 84
deontology, 84
descriptive moral theory, 84
feminist ethics, 85-86
justice, 85
metaethics, 84
nonmaleficence, 85
normative ethics, 84, 86
relational ethics theory, 86
social justice, 85
teleology, 84
utilitarianism, 84
- Ethnic groups
statistics in Canada, 109-110, 109f
- Ethnicity
and beliefs regarding death and dying, 117t, 118, 452, 452b, 456t
blood pressure and, 522
defining, 110-111
and gender roles in young adults, 362
and heart disease, 900b
questioning family regarding, 280-281
self-concept influenced by, 398, 399b
- Ethnocentrism, 111
- Ethnography, 75-76
- Ethnohistory
of Aboriginal peoples, 119-120
description of, 116, 117t
questions during cultural assessment, 114-116, 117t
- Etiologies, 167, 168f, 168t
- Eupnea, 513-514, 894t
- European contact, 119-120
- Eustress, 476
- Euthanasia, 103
- Evaluation
of client's self-concept, 412, 412f
during clinical care coordination, 133
communication skills needed during, 244b
critical thinking and nursing judgements, 148, 194-195, 194f-195f
definition of nursing process, 153-154, 154f, 193-194
evaluative measures, 196-197, 197f, 198t
example on nursing care plan, 183b
of expected outcomes, 195-198, 196t, 198t
five steps of
care plan reassessment, 198-199
data collection, 196-197, 198t
documentation, 198
identifying goal/outcome criteria, 195-196, 196t
interpreting and summarizing findings, 197-198, 198t
reassessment following, 187, 198-200
Evaluative measures, 196-197, 197f, 198t
- Evaporation, 492
- Evening primrose oil, 764t-765t
- Eversion, 1203, 1204t-1208t
- Evidence
clinical and "PICO" questions, 66-70, 66b, 73t
CNA definition of, 66, 66b
collection/critiquing/integrating, 66-70, 66b, 68b, 68f
Hierarchy of evidence, 67-68, 68f
types of, 70
- Evidence base
when choosing interventions, 178-182, 179b, 183b
- Evidence-informed decision making, 66, 66b, 70, 78, 130-133, 130b, 131t
- Evidence-informed knowledge
in critical thinking, 141, 143f
- Evidence-informed practice (EIP); See also "Research Highlight" boxes
and access to primary health care, 22-23
and AIDS Prevention Street Nurse Program, 49, 49b
based on nursing research, 65-66, 66b, 70, 78
best practice guidelines, 130, 130b, 135
on caring attitudes and behaviours, 265b
continuous learning environment, 133
definition of, 66, 66b
as nursing goal, 16
nursing resources for, 26-27
population health promotion model, 5, 12-13, 12f
steps for successful, 66, 66b
trends and nursing informatics, 228-229
- Evisceration, 1271, 1361-1362, 1364t-1365t
- Exaggerated grief, 450
- Examinations for licensure
E-Nursing competencies, 237-239
registered nurses (RNs), 95
- Excessive daytime sleepiness (EDS), 997, 997b, 1000
- Excoriation, 565-566
- Excretion
aging effects on medication, 688-690, 690b, 691f
in pharmacokinetics, 667
- Exercise and physical activity
activity tolerance, 774b, 1209-1210, 1240b
in immobile patients, 1209-1210, 1240b
influences and adaptations, 774-775, 779b, 781f
nursing process application to problems, 777-787
behavioural aspects, 775-776
benefits of
for blood pressure and hypertension, 522, 774b, 787
for bowel elimination, 1164-1165, 1178, 1178b
for cardiovascular system, 774b, 775, 786-787
for chronic obstructive pulmonary disease (COPD), 787
for coronary heart disease (CHD), 774b, 775, 786-787
for diabetes mellitus, 774b, 776b, 787
for fluid, electrolyte, and acid-base balance, 947-949, 947b
for growth and development, 311t, 312-313, 775-777, 784b
for metabolic system, 774b
for musculoskeletal system, 774b, 775
for older adults, 388-389, 390f, 775, 775b, 784b
for psychological health, 774, 784b
for pulse rates, 512t, 513, 786-787
for respiration, 514b, 775, 787
for stress management, 484, 484b, 485f, 774b
in young adulthood, 365, 775
cultural aspects of, 777b, 785b
deficits
affecting cardiopulmonary functioning, 888-889
- Eating Well with Canada's Food Guide recommendations, 1056
- habits
as determinant of health, 5, 8-9
and inactivity as behavioural risk factor, 3-4, 6f
influencing all aspects of wellness, 770b
metabolism and body temperature, 493
movement physiology (See body mechanics; movement)
- nursing process application to assessment, 777-779, 778f, 779b-780b
evaluation, 787, 788f
implementation, 781-787, 782b-784b, 786b, 786f
nursing diagnosis, 779, 780b
planning, 779-781, 780f-781f, 782b-783b
postsurgical, 1343b-1348b, 1344f-1345f
promotion and planning programs, 780-787, 782b-784b
recommendations throughout lifespan, 784b, 785-787
RICE treatment for injuries, 786b
school promotion of, 776

- Exercise and physical activity (*Continued*)
 strategies for initiating, 776b, 777,
 781-783, 782b-783b
 tai chi, 753t-755t, 756b, 784b, 787b
 types of programs, 774-775, 781-787,
 784b-785b
 work site diabetes prevention program,
 776b
- Exhaustion stage
 in general adaptation syndrome, 473,
 474f
- Exogenous infections, 624
- Exophthalmos, 559
- Exosystems, 321, 322b
- Expected outcomes
 associated with death and grief,
 459-460, 459b-460b
 of client education, 291, 291b-292b, 299,
 300b, 306
 client-centred, 175-178, 176f, 176t
 establishing during planning process,
 175-178, 175f-176f, 176t-177t
 guidelines for writing, 177-178, 183b
 and intervention planning, 178-182,
 179b, 183b
 relationship with goals, diagnosis, and
 interventions, 175-178, 176f
 for self-esteem improvement, 408-410,
 408b-409b, 410f
- Experience
 in critical thinking, 140-141, 143b, 143f,
 144
 data collection from, 158
 empirical data, 74
 importance during assessment process,
 155, 155f
 and knowledge development, 70-71, 70t
 and learning as basis for critical
 thinking, 140-141, 143-144, 143b,
 143f
- Experimental research, 73t, 74-75
- Expert witnesses, 96b
- Expiration, 513-514, 514f, 881
- Exploratory descriptive designs, 75
- Expressive aphasia, 258, 259b
- Expressive functioning, 282-284
- Extended family, 274-275, 275b, 280,
 281f-282f
- Extension, 1203, 1204t-1208t
- Extracellular fluids (ECFs), 937-945, 937t,
 939f
- Exudates, 624, 1262-1264, 1268-1269,
 1269t, 1270f
- Eye contact
 meanings in different cultures, 406
 nonverbal communication with, 247,
 250, 405f
- Eyebrows, 559-560
- Eyeglasses, 641b-643b, 641t, 644-645, 649,
 835b, 863
- Eyelids, 559-560
- Eyes
 anatomy and physiology of, 559f, 1302t
 bathing techniques for, 843b-850b, 845f,
 863-864
 changes with aging, 381-382, 381t, 835,
 1305-1306, 1305b
 characteristics of normal, 1302-1305,
 1302t
 cross-sectional diagram of, 559f
 examination of, 559-573, 559f, 560b,
 560t, 561f-562f, 563b
 gaze directions, 562, 562f
 health risks with hygiene issues, 837t
 hygiene, 827, 833, 835, 863-864
 infection defence mechanisms, 623t
 intraocular medications, 671, 697-704,
 700b-703b, 702f
 physical assessment of, 1308, 1309t
 protection equipment, 1308
 recommended screenings according to
 age, 545t-546t
 visual acuity, 563, 563b
- Eyewear, 626b, 641b-643b, 641t, 644-645,
 649, 863
- F
- Faces Pain Scale-Revised, 1028, 1030f
- Facial expressions
 nonverbal communication with, 247, 250
 pain response, 1020-1021, 1028-1029,
 1031b
- Facilitated diffusion, 938
- Facilitation skills
 needed in community health nursing, 50
- Fainting
 and balance, 1196
 helping patient, 1242, 1242f
 in older adults, 379-380, 379b
- Faith
 and pain, 1024-1025
 and self-concept, 398, 434-435
versus spirituality, 436-438
- Falls
 alpha-adrenergic blockers causing,
 1136b
 assistive devices
 hand rails for toilets and showers,
 810-820, 810f, 811t
 for mobility, 1243-1246, 1243f
 best practice guidelines for prevention
 of, 393, 393b, 775b, 796
 due to urination urges, 1136b
 effects of nursing rounds on prevention
 of, 810, 810b
 exercise aiding prevention, 775b
 gravity and friction, 1196
 within health care environment, 794
 helping patient during, 1242, 1242f
 Hendrich II Fall Risk Model, 798, 798t
 and immobility in older adults, 1196b,
 1202
 infant, 333, 334b-335b
 legal issues with patient, 98b
 lighting and call lights, 791, 796, 809,
 811t
 by older adults
 causes and seriousness, 379-380, 390,
 393b, 614b, 791-794, 793b,
 810-820, 810f, 811t, 1136b
 Hendrich II Fall Risk Model, 798, 798t
 physical and lighting hazards, 393,
 393b, 791-792, 796, 797b, 811t
 physiological changes contributing to,
 793-794, 793b, 798t
 prevention in hospital setting, 393,
 393b, 794
*Prevention of Falls and Fall Injuries in
 the Older Adult*, 796
 safety measures and equipment,
 810-820, 810f, 811t, 1136b
 with osteoporosis, 770
 physical restraints, 812-819, 812b, 813f,
 815b-819b
*Prevention of Falls and Fall Injuries in the
 Older Adult*, 796
 prevention while bathing, 843b-850b
 safety measures, 791-792, 810-820, 810f,
 811t, 1136b
 during seizures, 794-795
 toddler and preschooler, 340-341,
 342t-343t
 visual acuity affecting, 799b
- False imprisonment, 98
- False reassurances, 257
- Family; *See also* family nursing
 ABCs of engaging, 285t
 Aboriginal, 120, 275
 attributes of healthy, 276
 caregivers, 275-276, 276b, 287
 caring nursing behaviours toward, 270,
 270b, 270f
 composition of, 279-280, 282f
 coping skills influencing grieving, 456t,
 457b
 cultural beliefs regarding, 116-117, 117t
 current trends in Canadian, 274-275
 defining nursing unit coordination with,
 128b, 277-278, 278b
 definition of, 274
 domestic roles in, 275
 ecomap, 274-275, 282f
 economic status changes in, 275
 emotional communication, 283
 focus of as context, 277-278, 277f
 focus of as patient, 277, 277f
 forms of, 274-275, 275b
 gender roles and structure, 279-281,
 279f, 282f, 362-364
 hardness, 276
 importance of family-centred care,
 273-274
 influences of
 on exercise habits, 777
 on growth and development, 311t,
 312-313
 on self-concept, 403-405
 interventions, 284-287, 285t, 298, 298b
 life cycle stages, 274, 282
 older adults, 275-276, 276b
 partnerships in home health nursing,
 45-46
 relationships during adolescence,
 355-356
 and resilience, 323, 324b
 as source of client data, 156-158
 stress during young adulthood, 366
 structure of, 279-281, 279f, 282f
- Family (*Continued*)
 support
 and caregiving by, 276, 287
 for grieving, 465-466, 466b
 of patients in pain, 1024
 at time of death, 467
 teaching, 298, 298b, 466b
 transitions during middle adulthood,
 370
- Family history
 data collection, 160, 278-284
 genograms and ecomaps, 281, 281f-282f
- Family nursing
 Calgary Family Assessment Model
 (CFAM), 278-284, 279f
 branching diagram, 279f
 developmental assessment, 279f, 282
 functional assessment, 279f, 282-284
 structural assessment, 279-281, 279f,
 281f
- Calgary Family Intervention Model
 (CFIM), 284-287, 285t
- challenges and changes, 274-275,
 278-284, 279b
- collaborative relationships, 277-278, 278b
- current trends in Canadian families,
 274-275
- definition of, 273-274
- family forms, 274-275, 275b
- family-centred care importance, 273-274
- identifying assessment candidates,
 278-284, 279b
- interventions, 284-287, 285t, 298, 298b
- life cycle stages, 282
- primary health focus in, 276, 276b
- relational inquiry approach, 277-278,
 278b
- teenage pregnancy, 275-276
- Family support
 and caregiving, 276, 287
 during grieving process, 465-466, 466b
 of patients in pain, 1024
 at time of death, 467
- Family-centred care
 importance of, 273-274
- FASTCHECK, 1069, 1070t
- Fasting
 presurgery, 1350-1351
 spiritual or religious, 444b
- Fatigue, 1002
- Fats, 1052-1053, 1056-1058, 1057f, 1058t
- Fat-soluble vitamins, 1053
- Fatty acids, 1052-1053
- Fears
 adolescent, 328-329, 346t-347t, 348-349
 regarding death and dying, 449-450,
 449t, 465
 nighttime in infants and toddlers, 339t
 in school-age children, 328-329,
 346t-347t, 348-349
 of separation in infancy, 340
- Febrile, 493-494
- Fecal impaction, 1172-1174, 1181b, 1185b
- Fecal incontinence, 1167, 1174, 1175b, 1351
- Fecal occult blood test (FOBT), 1169,
 1170b-1171b
- Feces
 Bristol Stool Chart, 1166, 1166f
 characteristics of, 1055-1056, 1166, 1166f,
 1169, 1171t
 fecal analysis tests, 1398t
 specimens, 645, 646b
- Feedback
 in communication, 245f, 246
 importance during delegation process,
 135
- Feeding
 assisting patients with, 1079-1080
 breastfeeding, 328, 335-337, 351b, 363,
 366
 enteral (*See* enteral nutrition)
 parenteral (*See* parenteral nutrition)
- Feelings; *See* emotions
- Feet
 common problems of, 831-833, 832t
 diabetes mellitus and, 836, 851,
 852b-854b
 diabetic ulcers, 1267-1268, 1267f
 hygiene, 826-827, 831-836, 832t, 837t,
 851-854, 852b-854b
 joint movement, 1204t-1208t
 odour, 832t
- Feldenkrais therapy, 753t-755t
- Female condoms, 422t
- Female reproductive tract and genitals; *See*
also women
 bathing procedures, 843b-850b, 847f
 changes during middle adulthood, 368,
 369t
- Female reproductive tract and genitals
 (*Continued*)
 changes in older adulthood, 381, 381t
 external genitalia, 599, 599f, 600b
 menarche, 354, 354t, 397
 menopause and perimenopause, 368,
 369t, 372b, 493, 591b
 perineum, 1123
 physical assessment/examination of,
 597-599, 598t, 599f, 600b
 speculum exam of internal genitalia,
 599, 600b
 straight or in-dwelling catheter
 insertion, 1139b-1146b, 1140f,
 1142f-1143f, 1145f
- Feminism, 38-40
- Feminist ethics, 85-86
- Femoral artery and pulse, 507t, 586, 587f
- Fentanyl, 1044, 1044b
- Fenwick, Ethel Gordon, 36
- Fertilization, 327, 423
- Fetal alcohol syndrome (FAS), 329b
- Fetus, 328, 1062-1063
- Fever
 blood transfusion reaction, 988t
 or pyrexia, 493-494, 493f, 505, 505b
 affecting oxygenation, 882t, 883
 Fever of unknown origin, 494
- Fibre
 and bowel elimination, 1164-1165, 1176,
 1178b
 insoluble and soluble, 1052
 nutritional importance of, 1055-1056,
 1179, 1180t
- Fibrin, 1265, 1393t
- Fibrous joints, 770-771, 771f
- Fight-or-flight response, 473, 473f
- Filteration, 938, 939f
- Financial issues
 health care spending statistics, 19-20,
 20b
- Fine motor skills
 development in school-age children,
 347, 347t
- Fingers, 1204t-1208t, 1241
- Fire extinguishers, 807-810, 807b-808b,
 809f
- Fire hazards, 797b
- Fires, 792, 807-810, 807b, 808f-809f
- First Nations and Inuit Health Branch
 (FNIHB), 239
- First Nations people; *See also* Aboriginal
 peoples
 caring beliefs and practices, 122
 circle of life beliefs, 121-122, 310b, 312f
 cultural assessment of, 119-123
 culturally competent health care for,
 16-19, 120-123, 122b
 demographics and population statistics,
 109-110, 119-123
 diabetes prevention promotions,
 120-121
Eating Well with Canada's Food Guide,
 1056-1058, 1057f, 1058t
 ethnohistory of, 119-120
 family and social beliefs of, 120
 health risks, 120-121
 inequities and social injustices, 47-49,
 119-120, 123
 intergenerational trauma among, 121b
 primary health care (PHC), 18-19
 responsive and culturally competent
 health care, 16-19, 26
- Fish oil, 764t-765t
- Fistulas, 1271
- Five rights of delegation, 133-135, 134b
- Flashbacks, 477
- Flat bed position, 867t
- Flat bones, 770
- Flatulence, 1174-1175
- Flatus, 1162
- Flexion, 1203, 1204t-1208t
- Floating, 101
- Flossing, 854-861, 856b-858b
- Flow sheets, 208, 210, 211f-212f, 213, 213b,
 218f
- Fluid, electrolyte, and acid-base balances
 acid-base balance
 buffers, 941, 941f
 disturbances in, 942-945, 946f, 947b
 regulatory mechanisms, 941-942, 941f
 acute care procedures, 958-987, 1350
 body fluids
 carrier-mediated transport, 938, 939f
 case example, 937b
 cations and anions, 940-941, 946t
 composition of, 937, 937t
 diffusion, 938, 938f
 distribution of, 937, 937t

- Fluid, electrolyte, and acid-base balances
(*Continued*)
filtration, 938, 939f
hormonal regulation, 940
input and output regulation and
thirst, 938-940, 939f, 940f, 950,
953f, 954b
osmosis, 938, 938f
critical thinking models, 947f, 955f, 990f
diarrhea upsetting, 1174, 1176, 1179
disturbances in, 942-945
acid-base imbalances, 942-945, 946f,
947b
electrolyte imbalances, 942, 943t-944t,
947b
fluid imbalances, 942, 944t, 947b
electrolytes
cations and anions, 940-941
concentration in extracellular fluids,
937, 937t
imbalances, 942, 943t-944t, 947b
regulation of, 940-941
exercise benefits, 947-949, 947b
intravenous (IV) therapy (*See*
intravenous (IV) therapy)
medications affecting, 947b, 949, 949b,
987
nursing process application to
assessment, 947-954, 948b-949b,
951t-952t, 953f, 954b
evaluation, 987-990, 990f
implementation and concept map,
955-987, 956b-969b, 957f, 959f,
971t, 974b-984b
nursing diagnosis, 954, 954b
planning, 954-955, 955f, 956b-957b
postoperative assessment of, 1361, 1367
restorative care, 987
risk factors for imbalances, 947-949,
947b
in surgery patients, 1332, 1350, 1361,
1367
- Fluid containers, 727b-730b, 728f
Fluid volume deficit (FVD)
definition of, 947-948
nursing process example of, 947-990,
948b, 954b, 955f, 956b-957b, 957f
Fluid volume excess (FVE), 958
Fluids; *See also* fluid, electrolyte, and
acid-base balances
acidity or alkalinity measurement, 942,
944t
assessment questions regarding,
947-954, 948b
balance affecting urination, 1116
bowel elimination influenced by,
1164-1165
daily adult gains and losses, 939f
gastric, 1185f
intake and output measurement, 950,
953f, 954b, 1122f-1123f, 1123
intravenous (IV) (*See* intravenous (IV)
therapy)
role in wound healing, 1256-1257, 1256t
and skin integrity, 1256-1257, 1256t
water consumption importance, 1053
Foam dressings, 1286t, 1288
Focus charting, 209, 209b, 213, 213b
Focusing in communication, 256
Folic acid, 1388t-1389t
Follow-ups
in community health nursing, 51
Fontanels, 330, 331f
Food
Canadian programs for providing,
1077-1078, 1078b
dietary guidelines, 1056-1059, 1057f,
1058t
Eating Well with Canada's Food Guide,
1056-1058, 1057f, 1058t
nutrients (*See* nutrition)
safety and security, 791, 1056, 1079b,
1079t, 1167-1168
withdrawal in futile situations, 90
Food and Drug Act, 664, 763, 791
Food poisoning, 791, 808-809, 1167-1168,
1174
Food security, 1056, 1078b
Food-borne illnesses, 791, 808-809, 1078b,
1079t, 1167-1168, 1174
Foodshare, 1078b
Foot hygiene, 826-827, 831-836, 832t, 837t
Foot odour, 832t
Footdrop, 1197t, 1200, 1201f
Forearm, 1204t-1208t, 1241
Formal operations, 311t, 354
Formulas
enteral, 1087-1100, 1100b
infant, 1060
- Fortified foods, 1052
Fowler's bed position, 867t
Fractures
causing immobility, 1198
with osteoporosis, 770
Francophones, 109-111, 111b
Free radicals, 1053
French-speaking population
Francophones, 109-111, 111b
New France nursing history, 30-31,
434
sensory impairment and life satisfaction
research study, 1316b
statistics, 109-110
Frequency of voiding, 1121t
Freud, Sigmund
psychoanalytic model of personality
development, 315-317, 317t
psychosexual development stages, 316,
317t
- Friction
and gravity in body mechanics, 772-774,
1196
as risk factor for pressure ulcers, 1256,
1256f, 1260t-1261t, 1275t
Frostbite, 494, 791
Fruits, 1056-1058, 1057f, 1058t
Full-thickness wounds
pressure ulcers as, 1264-1266
repair, 1262t-1263t, 1264-1266
Functional assessment
in Calgary Family Assessment Model
(CFAM), 279f, 282-284
Functional foods, 1052
Functional incontinence, 1118, 1136b
Functional status
with immobility, 1196-1198, 1231
in older adults, 379-380, 381t, 382
Fundus, 562, 562f
Fungating wounds, 1268, 1268f
Fungi, 618-619, 620t, 832t
Futile care, 89-90
- G
Gait
defining and assessing, 547, 604,
605f-606f, 605t, 606b, 779, 1209
nonverbal communication with, 247
of older adults, 614b, 797
unsteady, 1196b, 1242f
Gait belts, 1230, 1242f
Galen, 30
Garlic, 764t-765t
Gastric fluids, 1100-1107, 1104b, 1185f
Gastrocolic reflex, 1162, 1165
Gastroenteritis, 957f
Gastrointestinal aspirate
obtaining for pH testing, 1101b-1102b
Gastrointestinal system
bowel elimination (*See* bowel
elimination)
changes with aging, 381, 381t
postoperative assessment of, 1362,
1364t-1365t
Gastrointestinal tract
anatomical diagrams of, 1160f-1161f
changes and infections in older adults,
624-627, 626b, 628t
disorders and hypokalemia, 949-950,
951t-952t
infection defence mechanisms in, 623t
organs of
anus, 1160f, 1162, 1162f, 1167
esophagus, 1160, 1160f-1161f, 1167t
large intestine, 1160f, 1162, 1162f,
1167, 1167t
mouth, 1160-1162, 1161f, 1167, 1167t
rectum, 1160f, 1162, 1162f, 1167, 1167t
small intestine, 1160f, 1161-1162, 1167,
1167t
stomach, 1160-1161, 1160f-1161f, 1167,
1167t
Gastrostomy tubes, 1097b-1099b
Gay population, 274, 275b, 280, 349, 351t,
352-355, 353t-354t, 357-359
Gaze directions, 562, 562f
Gender
and blood pressure, 522
communication patterns, 252-253
cultural belief variations regarding,
116-117, 117t
as determinant of health, 5, 9-10
as fluid, electrolyte, and acid-base
imbalance risk factor, 947b
and heart disease, 900b
identity search during adolescence, 355,
359
issues in families, 274
physical exams, 546-547
- Gender (*Continued*)
roles in young adults, 362
sensory deficit variables, 1303
statistics in nursing workforce, 16b
as *Strategies for Population Health Report*
determinant, 5
trends in nursing profession, 34, 37
Gender identity, 416-421, 417f, 418b
Gender roles
and family structure, 279-281, 279f,
282f, 362-363
General adaptation syndrome (GAS), 473,
474f
General anaesthesia, 1356
Generativity
during middle-age years, 369
versus self-absorption and stagnation,
318t, 321t, 398b
and self-esteem, 400
Genetically modified foods, 1052
Genetics
as determinant of health, 5, 8
growth and development influenced by,
311t
and increased health risks, 117t, 118
as *Strategies for Population Health* health
determinant, 5
Genital herpes, 365, 420
Genital self-examination (GSE)
female, 599, 600b
male, 602b
Genitourinary system
accident risks increasing with aging,
793b
changes with aging, 381-382, 381t
postoperative functional assessment,
1362, 1364t-1365t, 1366-1367
Genitourinary tract
changes and infections in older adults,
624-627, 626b, 628t
Genograms, 281, 281f
Geriatric assessment tools, 543, 544b
Geriatrics; *See also* older adults
definition of, 375
Gerontic nursing
definition of, 375
Gerontological nursing
definition of, 375
informational web site, 378-387
standards of practice, 378-387
Gerontology
definition of, 375
Gerotranscendence theory, 376-377
Gerson therapy, 753t-755t
Gesell's Theory of Maturation
Development, 312
Gestures, 247
Gilligan's Theory, 315
Ginger, 764t-765t
Gingivitis, 827, 833, 837t
Ginkgo biloba, 764t-765t
Glands, 540, 540t
Glasgow Coma scale, 610, 610t
Glass thermometers, 502, 502b-503b
Glaucoma, 560b, 1303, 1304b, 1308, 1315
Global aphasia, 258, 259b
Global citizen, 108-109
Global citizenship, 108-109
Global health
definitions and concepts of, 107-109
and health equity, 108
versus international and public health,
108t
Globalization
and cultural safety, 113-114, 113b
and emergence of modern nursing,
33-34, 107-109
Glomerulus, 1113, 1113f
Glottis, 1160, 1161f
Gloves, 103, 641b-643b, 641t, 644-645, 649,
652-659, 655b-657b
Gluconeogenesis, 1055
Glucosamine, 764t-765t
Glucose
and glycemic index, 1052
measurement and normal values,
1081-1082, 1082b-1087b, 1337t,
1388t-1389t, 1396t-1399t
self-monitoring of, 1081-1082,
1082b-1087b
urinalysis to measure, 1128t,
1396t-1398t
Glycemic index, 1052
Glycogenesis, 1055
Glycogenolysis, 1055
Goal setting
during planning process, 175-178,
175f-176f, 176t-177t
role of client in, 176, 176t
- Goals
associated with death and grief,
459-460, 459b-460b
of client education, 291, 291b-292b, 299,
300b, 306
client-centred, 175-178, 176f, 176t
combining with outcome statements,
177, 177t
communication, 253
guidelines for writing, 177-178, 183b
identifying/clarifying during
evaluation process, 193-196, 194f,
196t, 198t
and interventions, 178-182, 179b, 183b
revising following evaluation, 198-199
for self-esteem improvement, 408-410,
408b-409b, 410f
short-term versus long-term, 176
types of, 177-178
Goniometers, 606-607, 608f
Gonorrhea, 365, 420
"Good Samaritan" laws, 101
Gowns, 641b-643b, 641t, 644-645, 649,
652b-657b, 659, 983-985
Grains, 1056-1058, 1057f, 1058t
Grand theory, 56, 57t
Grandparents
increasing family roles for, 275, 275b,
369
Granulation tissue, 1261-1262
Gravity
centre of, 772-773, 778, 778f, 1209f
and friction, 1196
Grey Nuns, 16b, 17, 31, 42-43, 434
Grief
anticipatory grief, 450
bereavement, 449, 451b
complicated grief, 450
definition of, 449-451
factors influencing, 451-453, 452b, 455,
456t
family support, 452-453, 465-466, 466b
grief process theories
Bowlby's Four Phases of Mourning,
449-450, 449t
Kubler-Ross's Five Stages of Grief,
449, 449t
Worden's Four Tasks of Mourning,
449t, 450
knowledge base and critical thinking,
451-453, 453f, 459f, 470f
normal, 450, 454b
nurses coping with, 469, 469f
nursing process application to death
and
assessment, 453-458, 456t, 458b-460b
evaluation, 469-470, 470f
implementation and interventions,
461-469, 464t
nursing diagnosis, 458, 458b-460b
planning, 458-461, 459b-460b, 459f
types, stages and reactions to, 454-455,
454f
Grieving process
adapting client education around,
305-306, 305t, 466b
Gross motor skills
development in school-age children,
347, 347t
Grounded theory, 76-77, 76b
Group activities
fostering self-esteem, 397f
Growth and development; *See also*
development theories
benefits of exercise for, 311t, 312-313,
775-777, 784b
and factors influencing, 310, 311t
sleep patterns, 311t, 312-313, 1000-1001
stages and communication, 251b-252b,
252
Guided imagery, 484-485, 1036-1037
Guilt
versus initiative, 318t, 398b
when faced with death, 449-450, 449t
Gums, 568-570, 568t, 827, 833, 837t,
854-861, 856b-858b
Gunn, Jean L., 36b
Gunshot wounds, 97
Gustatory impairments
adjusting to, 1317-1319
causes of, 1306
and nutritional deficits, 1302
- H
Habit retraining
and prompted voiding, 1155
Habits
bowel elimination, 1165, 1176
exercise, 5, 8-9

- Habits (Continued)**
 formation of
 during middle adulthood, 370–372
 during young adult years, 364–365
 hygiene (See hygiene)
 middle adulthood, 370–372, 371b
 retraining urination, 1155, 1156b
 urination, 1119, 1121, 1134–1135
- Hair**
 characteristics and physical assessment
 of, 553–555, 556t, 557b
 common problems of, 834t
 hygiene, 557b, 827, 827f, 861–863, 862b
 loss
 implications and interventions, 834t
 during middle-age, 368, 369t
 preparation for surgery, 1351
 shampooing patient's, 861–863, 862b
 shaving, 863, 863f
- Halitosis**, 833
- Hall, Dr. Linda McGillis**, 131
- Hall Commission Report**, 17
- Hand**
 range of motion, 607f
- Hand rails for toilets and showers**,
 810–820, 810f, 811t
- Hand rolls**, 1221, 1221f
- Handwashing**
 hand hygiene procedures, 635–639,
 636b–639b, 652b–655b
 surgical asepsis, 646–659, 648b,
 648f–650f, 652b–655b, 1326
- Hand-wrist splints**, 1221, 1222f
- Hannah, K. J.**, 229–231, 234t
- Hard palate**, 570, 570f
- Hardiness of families**, 276
- Harm reduction nursing**, 49, 50b
- Hartmann's pouch procedure**, 1186f
- Havighurst's Developmental tasks**,
 320–321, 321t
- Hazards**
 home, electrical and fire, 797b
 materials, 794, 795f
 physical, 791–792, 797–798, 797b
 for sensory altered patients, 1309–1310
- Head; See also neck**
 changes with aging, 380, 381t
 physical assessment/examination of,
 557–559, 559f, 594, 951t–952t
- Head lice**, 554–555, 557b, 834t, 861
- Healing process**, 1264, 1265f
- Health**
 as actualization and stability, 2–3
 definitions and qualities of, 2–3, 2f, 263
 determinants
 Epp Report, 4, 5f
 Lalonde Report, 3–4, 6f
 overview of, 6–10
 social determinants of, 6
 Strategies for population health, 5
 strategies to influence, 10–11
 disparities, 6, 108, 108t
 goals within metaparadigm concepts,
 56–58, 57f
 historical approaches to, 3–6
 older adults coping with loss of, 377,
 377b
 relationship with illness and disease, 2f
- Health assessment and physical
 examination; See also assessments;
 physical assessments and
 examinations**
 holistic process and components of, 538
 purposes of, 538–539
 social and cultural considerations, 538
- Health Canada**
 on disinfection and sterilization,
 633–634, 633b, 634t
 on handwashing/hand hygiene,
 635–639, 636b–639b
 isolation guidelines, 640–644, 641t, 643b
 routine practices, 621t, 640–644,
 641b–643b, 641t
- Health care**
 highlights in world history, 30
 inequities
 affecting Aboriginal people, 47–49,
 119–120, 123
 definition of global, 108, 108t
 strategies to narrow, 6
 levels of care
 diagnosis and treatment, 25
 disease and injury prevention, 25
 health promotion, 25
 rehabilitation care, 25–26
 supportive care, 12, 26
 rights to, 6, 20–21
- Health care assistants (HCAs)**, 129–130
- Health care delivery system**
 challenges to, 26–27
 nursing management role in, 126–130
 rights within, 20–21
 settings
 community sector settings, 24–25
 institutional sector settings, 23–24
 parish nursing, 25
 spending statistics, 19
 trends and reforms in Canada's, 19–20
- Health care proxy**, 455
- Health care surrogates**, 104
- Health care team; See teamwork**
- Health care-associated infections (HAI)**,
 624–626, 625b–626b, 646, 1326
- Health determinants; See determinants of
 health**
- Health disparities**
 in Aboriginal people, 47–49, 119–121,
 123
 strategies to narrow, 6
- Health education; See health promotion**
- Health equity**, 108, 108t
- Health field concept**, 3–4
- Health habits**
 formation
 during middle adulthood, 370–372
 during young adult years, 364–365
 hygiene (See hygiene)
 middle adulthood, 370–372, 371b
- Health histories**
 procedures for taking, 156, 157b–158b,
 160
 sexual, 425
- Health identity**
 during adolescence, 356
- Health inequities**
 in Aboriginal people, 47–49, 119–121,
 123
 definition of, 108, 108t
 strategies to narrow, 6
- Health information; See also electronic
 health records (EHRs)**
 nursing informatics, 228–241
 *Personal Information Protection and
 Electronic Documents Act (PIPEDA)*,
 203, 236, 237b
- Health Information: Nursing Components
 (HINC)**, 233, 234t
- Health literacy**, 304–305
- Health professionals**
 professional organizations, 35–37, 37f
 self-regulation of, 19
- Health Professions Act**, 1382
- Health promotion**
 *Achieving Health for All: A Framework for
 Health Promotion*, 4, 5f
 defining process of, 10–11
 in family nursing, 276, 276b
 guiding principles and strategies of,
 11–12
 of hygiene, 841, 841b–842b
 level of care, 25
 nursing diagnosis, 166
 Ottawa Charter for Health Promotion, 4,
 5f, 10–12, 21–22
 population health approach, 5, 12f
 during pregnancy, 328, 329b
 recommended preventative screenings,
 545t–546t
 for school-age children, 349–351, 351t
 self-concept, 396, 403–412, 406f, 408f,
 410f, 411b, 412f
 sexual health, 422–423, 426–431,
 429b–430b
 tips regarding vital signs, 533, 533b
- Health Protection Branch (HPB)**, 665
- Health research**
 legislation regarding, 18, 18t
 nursing (See nursing research)
- Health services**
 as determinant of health, 5, 9
- Health status**
 growth and development influenced by,
 311t, 312–313
- Health threat response**
 in community health nursing, 51
- Healthy child development**
 as determinant of health, 5, 9
- Healthy living**
 as pillar of primary health care (PHC),
 22b
- Healthy practice environment**, 126, 128b
- Hearing**
 assessment of, 378, 1307–1311, 1309t
 characteristics of normal, 1302–1305,
 1302t
 deficits (See hearing loss)
- Hearing (Continued)**
 functions, 1302t
 sense of, 1301
- Hearing acuity**
 and anatomy of ears, 563–565,
 564f–565f, 564t
 deficits with aging, 380–382, 381t, 835,
 1305–1306, 1305b
 tuning fork tests, 565, 566t–567t
- Hearing aids**
 assessing need for, 545t–546t, 564t, 565
 malfunction troubleshooting, 1317b
 older adults' views concerning, 1310,
 1310b, 1317
 and presbycusis in older adults, 378,
 380, 381t
 and safety, 835, 835b, 865, 865f, 866b
 as stigma of dependency, 1310b, 1317
- Hearing Handicap Inventory for the
 Elderly (HHIE-S)**, 1307
- Hearing loss**
 accidents due to, 793–794
 adjusting to, 1317, 1319
 with aging, 380–382, 381t, 835,
 1305–1306, 1305b
 causes of, 1303–1305, 1304b
 communication methods, 258, 259b,
 1319–1320, 1319b
 with noise pollution/excess, 792, 793f,
 1305–1306, 1315–1316
 patient admitting to, 1308, 1310, 1310b,
 1317
 prevention of, 1316
 recommended screenings according to
 age, 545t–546t, 1315, 1315b
 social isolation due to, 1306
 and socialization, 1321–1322, 1321b
 statistics in Canada, 1303
 teaching methods, 305
- Hearing screening**
 types of tests, 1307, 1308f, 1309t, 1315,
 1315b
- Heart; See also cardiovascular system**
 acute coronary syndrome (ACS),
 886–887
 anatomical landmark sites, 580,
 580f–581f
 anatomical position of, 579f
 angina pectoris, 886
 auscultation, 581–582, 581f
 cardiac cycle, 578–579, 580f
 cardiac function diagnostic test, 895t
 cardiovascular physiology, 878–887, 878f
 blood flow regulation, 879
 conduction system, 879–880, 879f
 coronary arteries, 878, 878b, 878f
 electrocardiogram (ECG), 880, 880f
 myocardial blood flow, 878, 878f
 structure and function, 878–879, 878f
 systemic circulation, 879
 changes with aging, 380, 381t, 534b, 892t
 failure, 781f, 884
 myocardial infarction (MI), 879
 physical assessment/examination of,
 578–582, 579f–581f, 579t, 582b
 preoperative assessment of, 1336
 sinus node as "pacemaker",
 879–880
 sounds, 507b–511b, 512–513, 512f, 534b,
 541, 580–582
- Heart and Stroke Foundation**, 889–890,
 1068
- Heart diseases**
 acute coronary syndrome (ACS),
 886–887
 angina pectoris, 886
 cardiac dysrhythmias, 884, 885t–886t
 ethnicity and gender variables in, 900b
 factors affecting, 582b
 failure, 781f, 884
 lifestyle risk factors for, 888–889, 888b
 myocardial infarction (MI), 879
 in older adults, 380, 387–388
 patient teaching, 900b
 valvular, 884–886
 and wellness activities during middle
 adulthood, 370–372, 371b
- Heart murmurs**, 582
- Heart rate; See also pulse**
 and blood flow regulation, 879
 physiology and measurement of,
 506–513
 ranges of, 511t
 sounds, 507b–511b, 512–513, 512f, 534b,
 541, 580–582
- Heart rhythm**, 513
- Heart sounds**, 507b–511b, 512–513, 512f,
 534b, 541, 580–582
- Heat exhaustion**, 494
- Heat loss**, 492, 533b–534b
- Heat production**, 491, 534b
- Heatstroke**, 494, 505, 533, 533b–534b, 791
- Hébert, Marie Rollet**, 30–31
- Height**
 loss with osteoporosis, 604, 605t
 physical assessment/examination of,
 548–550, 549f–550f, 549t
- Helping process theory**, 59b, 61
- Helping relationships**, 248–250, 249b
- Hematemesis**, 891
- Hematocrit**
 measurement and normal values, 1337t,
 1393t
 and viscosity, 515b–517b, 521
- Hematology tests**, 1393t
- Hematuria**, 1117, 1121t
- Hemiparesis**, 778, 1197–1198, 1242
- Hemiplegia**, 1197–1198, 1242
- Hemodialysis**, 1115–1116, 1116b
- Hemoglobin**
 blood transfusions, 985–987, 986b–987b,
 986f, 986t, 988t
 and iron, 1053
 measurement and normal values, 1337t,
 1393t, 1396t–1398t
 respiration influenced by, 514b–517b,
 517, 882–884
- Hemoglobin-oxyhemoglobin system**, 941
- Hemolysis**, 986–987, 988t
- Hemoptysis**, 891
- Hemorrhages**
 postoperative, 1360–1361, 1364t–1365t,
 1365–1366
 pulse rates influenced by, 512t
- Hemorrhoids**, 603, 1175, 1179
- Hemostasis**, 1265
- Hemothorax**, 920
- Henderson, Virginia**, 59b, 60
- Hendrich II Fall Risk Model**, 798, 798t
- Heparin lock**, 741, 741f, 742b–747b, 743f
- Hepatic disease**
 diagnostic tests, 1337t, 1388t–1389t,
 1396t–1398t
- Hepatitis B virus (HBV)**, 596b, 619, 620t,
 792
- Herbal therapy**
 considerations with surgery, 1333t
 description and history of, 752, 753b,
 753t–755t, 763–764, 764t–765t
 early Aboriginal use of, 30
 natural health products (NHPs),
 763–766, 764t–766t, 767b
 self-medication for pain relief, 1038
- Heredity**
 as determinant of health, 5, 8
 genetics (See genetics)
 growth and development influenced by,
 311t
- Hernias**, 595
- Hertzman, Clyde**, 322–323
- Hesitancy in voiding**, 1121t
- Heterosexuality**, 416
- Hierarchy of evidence**, 67–68, 68f
- High altitude**, 882t
- High-density lipoprotein (HDL)**
 cholesterol, 582b, 1388t–1389t
- High-flow devices**, 925–928, 927t
- High-risk behaviours**
 sexual, 419
 stigmatizing, 47, 49, 50b
 substance abuse, 3–4, 6f
- Hinduism**, 442t, 753t–755t, 1065t
- Hips**
 fractures in older adults, 794 (See also
 falls)
 joint movements and ligaments, 771f,
 1204t–1208t, 1241
- Hirsutism**, 554
- Histamines**, 1169t
- History**
 of Aboriginal peoples
 early health care practices/conditions,
 30–32, 34, 119–120
 of Canadian nursing (See nursing
 history)
 of health care, 30
 of health-related Canadian legislation,
 16–19, 18t
 of infectious diseases in Canada, 30–33
 and pioneers of community health
 nursing, 42–43, 43b
 of practical nursing in Canada,
 1371–1375, 1373t
 of surgical nursing, 1326–1327
- HIV/AIDS; See human immunodeficiency
 virus/acquired immunodeficiency
 syndrome (HIV/AIDS)**
- H1N1 virus**, 24

- Holism
and spirituality, 435-436
Holistic health; *See also* complementary and alternative medicine (CAM)
philosophy and history of, 751-752, 757b
Holistic medicine
Aboriginal, 121-122, 310b, 312f, 753b and human act of caring, 243, 264, 265t for menopause symptoms, 372b pain management techniques
acupuncture, 753t-755t, 762, 762f, 1037
biofeedback, 1037
cognitive-behavioural, 1036
cold and heat applications, 1038
cutaneous stimulation, 1037-1038
distractions, 1037
health promotion techniques, 1036-1039
massage therapy, 752f, 753b, 753t-755t, 1037-1038, 1037f, 1038b
music therapy, 1037
Reiki, 1037
relaxation/imagery therapy, 484-485, 757-759, 758b, 1036-1037, 1036b
therapeutic touch, 753b, 753t-755t, 755b, 761, 761f, 1037-1038
transcutaneous electrical nerve stimulation (TENS), 1037-1038
philosophy and history of, 751-752, 757b
Holistic nursing model
caring as basis for, 264
and complementary and alternative medicine (CAM), 752-760, 757b
Homans' sign, 1343b-1348b
Home health care
home hazard assessment, 797-798, 797b, 799b, 799f
intravenous (IV) therapy, 741-747, 987, 989b
oxygen therapy, 928-929, 929b-932b, 929f, 929t, 931f
recovery following surgery, 1368, 1369b
wound care, 1274b
Home health care nursing
community health nursing practice, 45-46, 51-52
components of, 45
description and trends in, 24-25
documentation and reporting in, 220, 220b
providing care to older adults, 379b
scope of, 45-46
Home oxygen therapy, 928-929, 929b-932b, 929f, 929t, 931f
Homelessness
Cathy Crowe's advocacy regarding, 11-12, 11b
as vulnerable population, 45, 47-49, 48b, 48f
Homeopathic medicines, 753b, 753t-755t
Homeostasis
body fluid, 938-940
and sleep, 993-995
stress altering, 473, 473f
Homosexuality, 416
Honesty
and ethics, 82-86
and truthful documentation, 98b, 99
and values, 81-82, 81b
when adverse events occur, 90-91
Honey, 1288
Hope
caregiver, 76b
importance of sharing, 254
spiritual questions, 438-441, 439b
strategies to promote, 437b, 452-453, 456t, 462
Hormones
and body temperature, 493
regulating body fluids, 940
Hospice care, 25, 377-378, 463, 466-467, 1046
Hospitals
immobility hazards for older adults in, 1203b
as institutional sector setting, 23
providing care to older adults, 379b
sensory alterations in, 1306
sensory stimuli in, 1320-1321
Hot flashes, 493
Hôtel-Dieu, 31, 32b
Huff coughing, 932, 1343b-1348b
"Human act of caring" theory, 265, 266t
Human becoming theory, 59b, 62
Human ecological model, 45-46
Human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS)
in Aboriginal people, 121, 122b
and access to care, 22b
among young adults, 365
chain of infection knowledge, 619, 620t
description and statistics, 420
due to injection drug use, 49
as fluid, electrolyte, and acid-base imbalance risk factor, 947b-948b, 950
and harm reduction nursing, 49, 50b
legal issues with, 97, 103
lymph nodes, 571-572
mentorship case study, 122b
respiratory infections, 891
Human needs theory, 59b, 60
Human papillomavirus (HPV), 365, 420
Human resources
floating, 101
statistics and shortages, 27
Humidification, 901
Humidity, 791, 808-809
Humour, 254-255
Hutterites, 442t
Hybridization, 1374
Hydration
for cardiopulmonary rehabilitation, 886
fluid intake and thirst, 940f, 944t
of immobilized patients, 1220
as skin impairment risk factor, 831b
withdrawal in futile situations, 90
Hydrocephalus, 558-559
Hydrocolloid dressings, 1286t, 1287
Hydrogel dressings, 1286t, 1287-1288
Hydrogen ions, 941-942
Hydrostatic pressure, 938, 939f
Hygiene
assisting patients with, 835-836, 836f, 841-873, 842b-850b, 852b-860b, 853f
bathing a patient, 841-854, 843b-850b
body image and, 828
cultural variables, 828, 828b, 836
factors influencing, 827-829, 836
feet, 826-827
hair, 557b, 827, 827f
hands, 826-827
health risks due to, 837t
history of, 30
nails, 559b, 826-827, 827f
nursing process application to
assessment, 547, 829-837, 829f
evaluation, 873-875, 875f
implementation, 841-873, 841b-842b
nursing diagnosis, 837-838, 838b
planning, 838-841, 838f-839f, 839b-840b
oral cavity, 827, 827f
skin, 825-827, 826t, 829-831, 831b
skin risk factors for impairment, 831b
sleep, 997, 998b, 1002, 1005
socioeconomic factors influencing, 828
surgery patient, 1351
and urinary tract infections, 1119-1120, 1123, 1126f, 1135
Hyperbilirubinemia, 332
Hypercalcemia, 942, 943t-944t, 951t-952t
Hypercapnia, 883, 1109t
Hyperchloremia, 942
Hypercoagulation disorders, 843b-850b
Hyperemia, 1251-1252, 1252f, 1258f
Hyperesthesia, 112
Hyperextension, 1203, 1204t-1208t
Hyperglycemia, 1109t
Hyperkalemia, 942, 943t-944t, 949, 951t-952t
Hypermagnesemia, 942, 943t-944t, 951t-952t
Hyponatremia, 942, 943t-944t, 947b, 954b
Hyperopia, 560b
Hyperosmolar imbalances, 944t
Hyperpigmentation, 831b
Hyperpnea, 517t
Hypersomnolence, 996, 997b
Hypertension
antihypertensive medications, 522t
benefits of exercise for, 522, 774b, 787
changes with aging, 380, 381t, 388
description and classification of, 522-523, 522t
indicators and patient teaching, 585t, 586b
management in older adults, 388
Hypothermia, 494, 502, 504b, 533, 533b-534b
Hypertonic dressings, 1288
Hypertonic solutions, 971-972, 971t
Hypertonicity, 607
Hyperventilation, 517t, 887, 945, 946t, 949
Hypervitaminosis, 1053
Hypnotherapy, 753t-755t
Hypnotics, 1001, 1001b
Hypocalcemia, 942, 943t-944t, 951t-952t
Hypochloremia, 942
Hypodermoclysis, 747
Hypoglycemia, 1109t
Hypokalemia, 942, 943t-944t, 951t-952t
Hypomagnesemia, 942, 943t-944t, 951t-952t
Hyponatremia, 942, 943t-944t, 947b, 954b
Hypostatic pneumonia, 1199
Hypotension, 523
Hypothalamic-pituitary-adrenal (HPA) axis, 473-475, 474f
Hypothalamus, 474f, 475, 491, 493-494, 493f
Hypothermia, 494, 494t, 502, 505, 791
Hypothesis, 73, 73t
Hypothetical questions, 285t
Hypotonic solutions, 971-972, 971t
Hypotonicity, 607
Hypovolemia, 517t, 887, 946t
Hypovolemia, 883, 939-940
Hypovolemic shock, 1360-1361, 1364t-1365t, 1365-1366
Hypoxemia, 513, 1360, 1363-1365, 1364t-1365t
Hypoxia, 887, 929-932
I
Id, 316-317
Ideal body weight (IBW), 1068
Ideal self, 400
Identification
with role models, 400
Identification bracelets, 668f, 682f, 1354
Identification-situation-background-assessment-recommendation-repeat back (I-SBAR-R) technique, 223-226, 224b
Identity; *See also* self-concept
assessment questions regarding, 406t
confusion, 402
versus role confusion, 318t, 398b, 402
self-concept influenced by, 398
stressors, 401f, 402
Idiopathic pain, 1022
Idiosyncratic reactions, 667
Ileal loop diversion, 1119, 1119f
Ileum, 1161-1162
Illiteracy, 5, 7, 304
Illness
cultural assessment of, 117t, 118
definition of, 2-3, 263
and disease prevention, 10-11
historical evolution of treating, 3-6, 30
relationship with health and disease, 2f
spirituality aiding coping with, 433-438, 438f
Illness narratives, 286
Imagery, 484-485, 753t-755t, 757-759, 758b, 1036-1037, 1036b
Imaging, 896b, 1128f, 1129t-1130t, 1170t, 1172b
Imitation, 400
Immanent justice, 341
Immigration
challenges in Canadian health care, 26, 116, 117t, 118
ethnohistory, 116, 117t
statistics in Canada, 109-110, 109f
Immobilization; *See* mobility and immobility
Immune response, 622-624
Immune senescence, 626b, 627
Immune system
and infection control, 627-628, 627b
lymph nodes, 571-572, 571t, 572f, 589, 589f
serology-immunology tests, 1395t-1396t
Immunizations, 104, 296b, 337-338, 338t, 388, 632b, 792
Immunocompromised clients, 619, 620t-621t, 622-624, 627, 627b, 1332
Immunology tests, 1395t-1396t
Impaction
fecal, 1172-1174, 1181b, 1185b
Impaired gas exchange, 520-521
Impaired mobility
due to pain, 1032-1033
as risk factor for pressure ulcers, 1254, 1260t-1261t, 1275t
Impaired physical ability
diagnosis of, 174
affecting learning capabilities, 174
Impaired sensory perception
as risk factor for pressure ulcers, 1253, 1260t-1261t, 1275t
Impaired verbal communication, 253
Implantation, 327
Implementation
communication skills needed during, 244b, 253-258
critical thinking in, 185, 186f
definition of nursing process, 153-154, 154f
of interventions to improve self-concept, 411-412
of nursing care, 185-189
Incentive spirometry, 920, 920f, 1343b-1348b, 1345f
Incident pain, 1022
Incident reports
regarding accidents, 794
documenting, 225-226
legal issues with, 105
regarding medication errors, 678
Incisions
splinting, 1343b-1348b, 1346f
Income status
and access to health care, 26
addressed in *Achieving Health for All*, 4, 5f
as determinant of health, 5, 7
Epp Report on, 4, 5f
poverty (*See* poverty)
as *Strategies for Population Health* health determinant, 5
vulnerable populations due to, 45, 47-49, 48b
Incontinence
description and common causes of, 1121t
causing falls, 807b
fecal, 1174, 1175b, 1351
in older adults, 379-380, 381t, 382
skin breakdown with urinary, 1118b
types of urinary, 1117-1118
urinary tract infections causing, 1117
Independence
autonomy stress in (*See* autonomy)
desires and sensory assistive devices, 1310, 1310b
fostering self-esteem in older adults, 317-319, 319f
older adults coping with loss of, 377, 377b
sensory function affecting, 1302
Independent nursing interventions, 178
Indian Act, 18-19, 119
Indigenous peoples, 110, 119-123, 122b;
See also Aboriginal peoples
Indirect care interventions, 185, 190, 190b
Individuation, 315
Indurated skin, 552-553
Induration, 1257b
Industry
versus inferiority, 318t, 398b
In-dwelling or straight catheter
catheter care, 1146, 1147b-1148b
insertion procedures, 1137-1138, 1137b, 1143f-1145f
Inequities
affecting Aboriginal people, 47-49, 119-120, 123
addressed in *Achieving Health for All*, 4, 5f
as determinant of health, 5, 7
and emancipatory knowing, 70t, 71
Epp Report on, 4, 5f
and global citizenship, 108-109
in global health care, 108, 108t
nursing awareness of social, 91b
strategies to narrow, 6
and women's rights movement, 38-40
Infancy/infants
acceptable respiratory rates, 514t
age period defining, 327b
car seats, 801-803, 803t-804t, 805f
cognitive changes, 332-333
fluid volume deficit (FVD), 947-948
health risks/concerns
accidents, 333, 334b-335b
child maltreatment and neglect, 333, 336b
immunizations, 337-338, 338t
nutrition and breastfeeding, 335-337, 351b, 1059-1061
sleep patterns, 338-339, 339t
sudden infant death syndrome (SIDS), 333
tooth eruption and teething, 337
heart rate ranges in, 511t
immobilization effects, 1202

Infancy/infants (*Continued*)

- medication administration, 688
 - pain, 1022–1026, 1023b, 1024t, 1028b
 - pain scales, 1028–1029
 - physical changes, 332
 - psychosocial changes, 333
 - play, 333
 - separation, 333
 - safety interventions, 803–805, 803t–804t, 805f
 - safety threats, 793
 - skin and hygiene changes, 833
 - sleep patterns, 338–339, 339t, 1000
 - sucrose for pain, 1028b, 1041
 - teaching methods, 295, 295b
 - upper respiratory tract infections, 887
- Infection control**
- age as a factor in, 626b, 627–629, 628t
 - asepsis and medical asepsis, 632–659
 - bagging waste or linen, 641b–643b, 645
 - cleaning, 633, 633b
 - disinfection and sterilization, 633–634, 633b, 634t
 - handwashing/hand hygiene, 635–639, 636b–639b, 652b–655b
 - ports of entry and exit control, 634–635, 639–640
 - reservoir control/elimination, 634, 634b
 - routine practices and isolation guidelines, 640–644, 641b–643b, 641t
 - specimen collection guidelines, 645, 646b
 - transmission control, 635–639, 636b–639b
 - chain of infection, 619–626, 619f, 620t–621t
 - infectious agents, 619, 619f, 620t–621t
 - modes of transmission, 619f, 621–622, 621t
 - portal of entry, 619f, 621t, 622, 622b, 639–640
 - portal of exit, 619f, 620–621, 634–635
 - reservoir, 619–620, 619f, 620t, 634, 634b
 - susceptible hosts, 619f, 621t, 622, 622b, 627–628, 640–646, 640b
 - clinical appearance, 628–629
 - communicable disease legal issues, 103
 - defences against infection, 620t, 622–624, 623t, 627
 - body system defences, 623, 623t
 - immune response, 622–624
 - inflammatory response, 623–624, 623t
 - normal flora, 622–623
 - health care-associated infections (HAI), 624–626, 625b–626b, 646
 - for hospital and surgical personnel, 641t, 646–659, 648b, 650f
 - immunizations, 632b
 - infection control professionals, 646
 - infectious process and course, 622, 622b
 - laboratory tests, 629, 629t (*See also* Appendix B)
 - microorganisms, 618–619, 620t–621t
 - nursing process application to assessment, 626–629
 - evaluation, 625b–626b, 630b–631b, 659–660
 - implementation, 625b–626b, 630b–634b, 632–659, 634t, 636b–643b, 641t, 646b–647b, 650b–651b
 - nursing care plan, 624, 625b–626b, 630–632, 630b–631b
 - nursing diagnosis, 625b–626b, 629–630, 629b–631b
 - nutrition as factor in, 627
 - in older adults, 626b, 627–629, 628t
 - patient teaching, 646, 647b
 - personal protective equipment, 641b–643b, 641t, 644–645, 645b, 649, 652b–657b, 659
 - during physical examinations, 541–542
 - purposes of, 619
 - surgical scrub procedures, 648b, 652, 652b–655b
 - transporting patients, 645–646
 - urinary system, 1119–1120, 1135
 - Infection control professionals, 646
- Infections**
- associated with intravenous (IV) therapy, 626b
 - characteristics indicating wound, 1257, 1257b
 - early work on prevention of surgical, 1326–1327

Infections (*Continued*)

- gastrointestinal, 1167–1168
 - health care-associated infections (HAI), 624–626, 625b–626b, 646, 1326
 - and pressure ulcers, 1257, 1257b, 1275t
 - prevention during intravenous (IV) therapy, 965f, 970–971, 970b, 974b–984b, 978–985, 978f
 - reduction of surgical wound, 1350–1351
 - risk factors, 627, 627b
 - in school-age children, 349
 - serology-immunology tests, 1395t–1396t
 - skin, 831b
 - urinary tract infections (UTIs), 1117, 1135
 - wound, 626b, 1257, 1257b, 1271, 1274b
- Infectious agents**, 619, 619f, 620t–621t, 1167–1168
- Infectious diseases**
- bowel elimination problems due to, 1167–1168
 - description and types of, 619, 620t–621t
 - history in Canada, 30–33
 - legal issues with, 103
- Infectious materials**
- Workplace Hazardous Materials Information System (WHMIS), 794, 795f
- Inferences**
- clinical, 145
 - cues *versus*, 155–156, 156f
- Inferiority**
- versus* industry, 318t, 398b
- Inferred pathology process pain**, 1022, 1022t
- Infertility**, 365, 423–424
- Infiltration scale**, 970, 970b, 970t, 985
- Inflammatory response**, 623–624, 623t, 1264–1265
- Influence**
- in families, 284
- Influenza**
- immunizations for older adults, 104, 296b, 388
- Informatics; *See* nursing informatics**
- Information**
- communicating, 255–256, 286
 - as pillar of primary health care (PHC), 22b
- Information and communications technology (ICT)**, 229
- Information systems**
- nursing process and clinical designs, 222–223
- Information technology**, 229–231, 230t–231t
- Informed consent**
- ethics and, 88–90
 - laws, 99–100
 - in research situations, 77–78, 77b
- Informed decision making**
- ethical responsibility of nurses to promote, 82b, 88–90
- Infusions**
- intravenous (IV) administration methods, 735–747
 - large-volume, 736
 - volume-controlled, 736–741
 - Inguinal lymph nodes, 589, 589f
 - Inguinal ring and canal, 602
 - Inhalation medication administration, 664t, 670t, 671, 705–711, 708b–711b, 709f
- Inhibition**, 399
- Initiative**
- in client interpersonal communication, 243
 - versus* guilt, 318t, 398b
- Injection drug use**
- HIV/AIDS due to, 49
 - signs of, 552, 552t
- Injections; *See also* medication administration**
- adding medications to IV fluid containers, 727b–730b, 728f
 - administering procedure, 722b–727b, 724f–726f
 - disposable units, 713f
 - intramuscular, 731–732, 731f, 732b, 733f
 - intramuscular (IM), 664t, 670, 670t
 - preparation procedures, 711–713, 712f, 714b–719b, 735b
 - preparing from ampule, 713, 713f–714f, 714b–719b
 - preparing from vials, 714b–719b, 719f
 - route of medication administration, 664t, 670–671, 670t
 - solutions and measurements, 672, 672t
 - subcutaneous, 721–731

Injuries

- in infancy, 333, 334b–335b
 - in preschoolers, 344–345
 - prevention in toddlers and preschoolers, 340–341, 342t–343t
 - risks and safety, 791–792
 - in school-age children, 350t
 - in toddlers, 340–341, 342t–343t
- Inpatient hospital care**
- history of coverage for, 17
- Input and output regulation**, 938–940, 939t, 940f
- Insensible water loss**, 939
- Insomnia**, 996–997, 997b, 1004b
- Inspection; *See also* individual body systems**
- of cardiopulmonary status, 892–893, 893t
 - procedures and principles of, 539, 540t
- Inspiration**, 513–514, 514f, 881
- InspireNet**, 238b
- Instillation**
- nasal, 697, 699b–700b
- Institute of Deaconesses**, 30, 32
- Institute of Medicine**
- on medical errors, 672
- Institutional care plans**, 182
- Institutional sector settings**
- hospitals, 23
 - long-term care (LTC) facilities, 23
 - psychiatric facilities, 24
 - rehabilitation centres, 24
- Instrumental activities of daily living (IADLs)**, 189, 282, 1196–1198, 1231
- Insulin**
- effects during surgery, 1333t
 - laboratory values and possible etiologies, 1388t–1389t
 - preparation and injection, 719–720, 720b–727b, 720t
 - safe administration and storage of, 687b
 - types and classification of, 719–720, 720t
- Insured residents**
- defining in *Canadian Health Act* of 1984, 17–18, 18t
- Integrative medical programs**, 752, 757b
- Integrative medicine**, 752
- Integrity**
- versus* despair, 318t, 321t, 398b
 - and honesty in ethics, 81–86, 81b
- Integumentary system**
- changes
 - with aging, 380, 381t
 - with immobility, 1201, 1201b, 1210t, 1211, 1220
 - and higher surgical risks in older adults, 1331t–1332t
 - physical assessment/examination of, 550–557 (*See also* hair; integumentary system; nails; skin)
 - preoperative assessment of, 1336
- Intellectual capacity**, 294
- Intentional torts**, 97–98
- Intentionality**, 254, 256b
- Interactionist theories**
- Evelyn Adam's helping process theory, 59b, 61
 - Hildegard Peplau's theory, 59b, 61
 - Joyce Travelbee's theory, 59b, 61
- Intergenerational trauma**
- among First Nations people, 121b
- Intermittent pneumatic compression (IPC)**, 1217–1219
- Intermittent venous access**, 741, 741f, 742b–747b, 743f
- International Classification for Nursing Practice (ICNP)**, 233–235, 234f–235f, 235t
- International Council of Nurses (ICN)**
- Code of Ethics, 83b
 - defining nursing, 29
 - developing International Classification for Nursing Practice (ICNP), 233–235, 234f–235f, 235t
 - history and functions of, 36
- International health**
- versus* global and public, 108t
- International Health Terminology Standards Development Organization (IHTSDO)**, 234
- International Medical Informatics Association (IMIA)**, 240
- International Medical Informatics Association-Nursing Informatics (IMIA-NI)**, 230t–231t
- International Medical Informatics Association-Special Interest Group in Nursing Informatics (IMIA-SIGNI)**, 239, 239b

- International Society for Quality in Health Care (ISQua)**, 27
- Interpersonal communication**, 245, 245f, 251b
- Interpersonal relationships and skills**, 188–189, 243, 245, 245f, 251b
- Interpersonal variables**, 245f, 246, 246b, 251b
- Interpretation**
 - of evaluation findings, 197–198, 198t
 - interpreters, 259b, 379
- Interprofessional teams**, 129–130
- Interstitial fluid**, 937
- Interventions**
 - associated with nursing activities, 179–182, 179b, 183b
 - based on learning needs, 293–294, 293b, 297t, 301, 302b
 - client education
 - based on learning needs, 293–294, 293b, 297t, 301, 302b
 - teaching, 300b, 301
 - in death and dying situations, 459b–460b
 - definition of, 185
 - direct *versus* indirect care, 185, 189–190, 190b
 - evaluation of, 199–200
 - family, 284–287, 285t
 - HI:NC definition of, 233, 234t
 - on nursing care plans (*See* individual chapter care plans)
 - Nursing Interventions Classification (NIC), 178–182, 180t–181t, 183b, 300b
 - for physical comfort, 179b, 183b
 - prioritizing, 174f, 175, 176f
 - relationship with goals, expected outcomes, and diagnosis, 175–178, 176f
 - six factors for selecting, 178–182, 179b, 183b
 - standard
 - clinical practice guidelines and protocols, 185
 - medical directives or standing orders, 185–186
 - teaching, 300b, 301
 - types of, 178
- Interviews**
 - Calgary Family Assessment Model (CFAM), 278–284, 279f
 - data collection, 158–160, 159b
 - family, 277–278, 278b, 287
 - nurse-patient communication tips, 250–251
 - assertiveness, 251
 - autonomy and responsibility, 251
 - courtesy, 250
 - respect and dignity awareness, 250–251
 - self-introduction and use of names, 250
 - trustworthiness, 250–251
 - physical examination, 543
 - spirituality, 438–441, 439b
 - stress assessment, 479–480, 480f, 480t
- Intimacy**
 - versus* isolation, 318t, 321t, 398b
- Intonation**, 246, 250
- Intra-arterial medication administration**, 664t, 670t, 671
- Intra-articular medications**, 671
- Intracardiac medications**, 671
- Intracellular fluids (ICFs)**, 937–945, 939f
- Intradermal (ID) medications**, 664t, 670, 670t, 722b–727b, 734
- Intramuscular (IM) injections**, 664t, 670, 670t, 722b–727b, 733–734
- Intraocular medications**, 671, 697–704, 700b–703b, 702f
- Intraosseous medications**, 671
- Intraperitoneal medications**, 664t, 670t, 671
- Intrapersonal communication**, 244–245, 251b
- Intrapleural medications**, 671
- Intraprofessional nursing teams**, 129–130
- Intrathecal medication administration**, 671
- Intrauterine device (IUD)**, 421, 422t
- Intravascular fluid**, 937
- Intravenous house protective device**, 985, 985f
- Intravenous (IV) therapy**
 - adding medications to fluid containers, 727b–730b, 728f
 - administration methods, 735–747
 - arm board and positioning for, 973–977, 977f
 - aseptic techniques and infection prevention, 965f, 970–971, 970b, 974b–984b, 978–985, 978f

- Intravenous (IV) therapy (*Continued*)
 device and equipment options, 972, 972f
 discontinuing, 985
 dressings changes, 983, 983b-984b
 electronic infusion devices (EIDs), 973, 973b
 flow rate regulation, 973-977, 973b-977b
 fluid, electrolyte, and acid-base imbalance, 947-949, 947b, 949b, 959-971, 959b-970b, 959f, 970t-971t
 in home setting, 741-747, 987, 989b
 house protective device, 985, 985f
 infections associated with, 626b
 infusions
 bolus, 736, 737b-741b, 738f-740f
 flow rate regulation, 973-977, 973b-977b
 intermittent venous access, 741, 741f, 742b-747b, 743f
 large-volume, 727b-730b, 736
 mini-infusion pump, 741, 742b-747b, 746f
 peak concentration levels, 668-669, 668f
 "piggyback", 677, 735-741, 736f, 742b-747b, 743f
 tandem, 741, 742b-747b, 743f
 volume-controlled, 736-741, 742b-747b, 744f-745f, 973-977
 maintenance of system, 978-985, 978b-982b
 peripheral vascular access devices (PVAD) and infusion, 959-971, 959b-970b, 959f, 970t, 983b-984b
 procedures and equipment, 971-985, 971b-977b, 971t, 972f
 protecting older adult's veins and skin, 973b
 route of medication administration, 664t, 670, 670t, 735-747, 737b-747b
 safety alerts, 971b-973b, 987b
 sites
 bathing techniques, 843b-850b, 844f
 venipuncture, 970b, 972-973, 972f, 985
 solutions, 971-972, 971t
 Intravenous pyelogram (IVP), 1129t-1130t
 Introductions, 250
 Inuit people; *See also* Aboriginal peoples
 demographics and population statistics, 119-120
 diabetes prevention promotions, 120-121
 primary health care (PHC), 18-19
 responsive and respectful health care for, 16-19, 26
 Invasion of privacy, 97-98
 Invasive procedures
 risk of infection with, 618-619
 Inversion, 1203, 1204t-1208t
 Invisible cultures, 110
 Ions, 937, 940-941, 946t
 Iron, 1169t, 1388t-1389t
 Irregular bones, 770
 Irrigation
 medication administration by, 711
 solutions and measurements, 672, 672t
 of wounds, 1277-1280, 1278b-1279b, 1289-1294, 1290f, 1291b-1293b
 Irritable bowel syndrome (IBS), 1168
 Islam, 442t, 1065t
 Isolation; *See also* social isolation
 fears of dying patients, 465
 guidelines and routine practices, 640-644, 641b-643b, 641t
 versus intimacy, 318t, 321t, 398b
 precautions, 640-644, 641b-643b, 641t
 Isometric contractions, 772, 775
 Isometric exercises
 for immobile patients, 1220
 program of, 775
 Isotonic contractions, 772, 774-775
 Isotonic exercises, 774-775
 Isotonic imbalances, 944t
 Isotonic solutions, 971-972, 971t
- J**
 Jackson-Pratt drainage device, 1269-1270, 1270f
 Jakarta Declaration, 5
 Jaundice, 551-552, 552t
 Jejunostomy tubes, 1097b-1099b
 Jejunum, 1161-1162
 Job stress, 366
 Johns, Ethel, 127b
 Johnson, Dorothy, 61
 Joint Commission on Accreditation of Healthcare Organizations (JCAHO), 207
 Joint contracture, 1200, 1201f
- Joints
 descriptive movement terms and illustration, 1203-1204, 1204f
 determining body alignment and posture, 770-771, 1196
 four types of, 770-771, 771f
 physically supporting during rehabilitation, 1240f-1241f
 and physiology of movement, 770-771, 771f
 range of motion (ROM), 604-607, 606t, 607f-608f, 778-779, 1203-1204, 1204f, 1204t-1208t
 Journal writing, 148-149, 485
 Journals
 Canadian Journal of Nursing Informatics, 239, 239b
 Canadian Journal of Nursing Research, 71, 72b
 evolution of Canadian practical nursing, 1372, 1373t, 1384
 Judaism, 442t, 1065t
 Jugular veins, 584, 585f
 Justice
 defining, 85
 ethical responsibility of nurses to safeguard, 82b
- K**
 Kardex system, 182, 213-219
 Kataoka-Yahiro and Saylor critical thinking models, 142-148, 143f
 Kava, 766t
 Keating, Daniel P., 322-323
 Keating-Hertzman's population health approach, 322-323
 Kegel exercises, 1154-1156, 1155b
 Keratosis, 832t
 Ketones, 1055, 1128t, 1396t-1398t
 Ketouria, 1128t
 Kidney stones, 1114
 Kidney transplants, 1116
 Kidneys
 anatomy and physiology, 1113-1119, 1113f-1114f
 assessment of, 1120f, 1122-1123
 diseases causing urination problems, 1115-1116, 1116b
 and fluid, electrolyte, and acid-base balance, 947-950, 947b-948b, 951t-952t
 renal scan, 1129t-1130t
 tenderness, 596-597
 Kilocalories (kcal)
 definition of, 1051
 and nutrient density, 1052
 Kinesthetic sense, 1301, 1304b, 1309t
 Kirby Report, 20, 20b
 Knee joint, 1204t-1208t, 1241
 Knock-knee, 1197t
 Knowledge
 in clinical decision-making process, 141-142, 142t, 143b, 143f, 145-147, 163f
 in critical thinking, 143-144, 143b, 143f, 155, 155f
 cultural, 112, 112f
 development patterns
 emancipatory knowing, 70t, 71
 empirics, 70, 70t
 ethics and dilemmas, 70t, 71
 personal knowledge, 70, 70t
 from evidence-based nursing research, 66-70
 and implementation, 186f
 metaparadigm concepts, 56-58, 57f
 for nursing diagnosis, 163-164, 163f, 166
 of patient exhibiting caring, 269-270
 and philosophy of nursing science, 58
 in planning process, 175-178, 175f
 seeking contextual, 244
 of treatment options and error prevention, 178, 178t, 183b
 used in evaluation process, 194-195, 195f
 "ways of knowing", 58
 Kock continent ileostomy, 1185
 Kohlberg's Theory of Moral Development, 315, 316t
 Koilonychia, 558b
 Korotkoff sounds, 524b-528b, 529-530, 529t, 530f
 Krieger, Dr. Dolores, 761
 Kübler-Ross's Five Stages of Grief, 449, 449t
 Kuhn, Thomas S., 58
 Kussmaul's respiration, 517t, 894t
 Kypholordosis, 1197t
 Kyphosis, 604, 606f, 1197t
- L**
 Labia majora, 599, 599f
 Labonte, R.
 on multidimensional conceptualization of health, 2-5, 2f-3f, 44
 Venn diagram for health and wellness, 2-4, 3f, 44
 Laboratory tests; *See also* Appendix B
 for acid-base imbalance, 942-945, 946t, 950-952, 954b, 1388t-1389t
 Canadian Système Internationale d'Unités (SI units) (*See* Appendix B)
 during cardiopulmonary assessment, 515b-517b, 517, 893, 894t-895t, 896b
 cerebrospinal fluid analysis, 1399t
 data, 160-161
 for electrolyte imbalances, 942, 943t-944t, 950-952, 954b (*See also* Appendix B)
 fecal analysis tests, 1398t
 for fluid disturbances, 942, 944t, 950-952, 953f, 954b
 gastric analysis, 1398t
 hematology tests, 1393t
 for infection detection, 629, 629t, 1395t-1396t
 for nutritional assessment, 1068-1069 (*See also* Appendix B)
 pre-surgery diagnostic screening, 1337t
 serology-immunology tests, 1395t-1396t
 serum, plasma and whole blood chemistry values, 1388t-1389t
 urine chemistry tests, 1396t-1398t
 Labyrinth meditation, 753t-755t, 755
 Lacerations
 versus abrasions, 1268
 Lacrimal apparatus, 561, 561f
 Lactation, 1063
 Lacto vegetarian diets, 1065-1067
 Lactose intolerance, 1066b, 1164
 Laddering, 1376
 Lalonde, Marc
 on primary health care model, 21-22
 Lalonde Report, 3-4, 6f
 Land pollution, 792
 Landmarks
 anatomical chest wall, 573f
 Language
 Aboriginal, 121
 cultural assessment of, 117t, 118, 246, 251b
 French-speaking population, 109-110, 1316b
 interpreters, 246, 259b
 as learning barrier, 304-305
 mental status indicated by, 611
 non-English speaking patients, 246, 251b, 259, 259b, 274
 religious and cultural sensitivity, 434b
 skill development
 first sounds in infancy, 333
 in preschoolers, 341-344
 in school-age children, 348
 in toddlers, 340
 Lanugo, 328
 Laparoscopy, 1327
 Large bore tubing, 1100-1107, 1104b-1106b
 Large intestine
 and bowel elimination, 1160f, 1162, 1162f
 Large-volume infusions, 727b-730b, 736
 Latex sensitivity, 1333, 1352, 1354b
 Latin American medicine practices, 753b
 Laws; *See* legal issues
 Lawsuits, 96, 96b
 Laxatives, 1064t, 1179, 1179b, 1180t
 Lead poisoning, 792
 Leadership and management, 125-139
 best practice guidelines for, 130, 130b, 135
 clinical care coordination, 133-135
 collaborative practice, 126-133, 128b, 130b, 132f, 135
 competencies needed in, 126b, 130-135, 131f, 131t
 conceptual model for developing and sustaining, 127f
 decision making, 130-133, 130b, 131t, 132b
 defining nursing mission and values, 128b
 definitions of, 125-126
 Ethel Johns, 127b
 five rights of delegation, 133-135, 134b
 management structures, 130-133, 131t
 models of care, 126-130
 nursing student skill development in, 136-137, 136f
- Leadership and management (*Continued*)
 in primary health care, 128b
 quality care and patient safety goals of, 135-136, 136b
 roles for nurses, 126-135
 staff mix decision making, 132b
 and teamwork, 126-130, 126b, 128b
 Leadership skills
 competencies, 126b, 130-135, 131f, 131t
 needed in community health nursing, 50, 133-135
 of practical nurses, 1380, 1381f
 Learning; *See also* client education
 abilities and disabilities, 297t, 298, 304-305
 continuous environment, 133
 domains, 293-294, 293b, 305-306, 305t
 environment, 133, 294
 and experience as basis for critical thinking, 140-141, 143-144, 143b, 143f
 motivation, 296-298, 297t
 needs, 297, 297t
 objectives, 297, 299
 principles, 294-297, 295b
 sensory deficits impairing, 1303, 1304b
 social learning theory, 296
 styles and preferences, 295-296
 teaching methods and processes, 292-293, 293b, 295b, 295f, 297, 299, 301-302, 301b-302b
 topics for, 291, 292b
 Learning disabilities, 297t, 298, 304-305, 1303, 1304b
 Learning environment, 133, 294
 Left-sided heart failure, 884
 Leg ulcers, 1266, 1266f-1267f
 Legal issues, 94-106
 abortion, 102
 advance directives, 104
 child abuse laws, 104-105
 communicable diseases, 103
 contracts and employment agreements, 102
 with death and dying, 103-104
 documentation and reporting guidelines, 204, 205t
 with drug administration, 102-103
 floating and competence issues, 101
 lawsuits, 96, 96b
 legislation and regulatory bodies, 1382-1383
 Liability issues for nurses
 assault, 97
 battery, 97
 confidentiality breaches, 97-98
 criminal liability, 99
 false imprisonment, 98
 informed consent, 99-100
 intentional torts, 97-98
 invasion of privacy, 97-98
 medication errors, 98-99, 98b
 negligence, 96, 98-99, 98b
 torts, 97
 unintentional torts, 98-99
 malpractice insurance, 101
 mental health issues, 104
 nurse practitioner regulations, 95
 nursing fiduciary responsibilities, 94-97
 for nursing students, 100-101
 organ donations, 104
 phone advice, 102
 physicians' orders, 102
 professional regulations, 95, 1382-1383
 public health laws, 104-105
 and risk management, 105
 short staffing problems, 101-102
 sources of law, 95
 standards of care, 95-97
 Legislation; *See also* legal issues
 history of health-related Canadian, 16-19, 18t, 1373t
 regarding practical nursing in Canada, 1382
 Leininger, Madeleine M.
 culture care theory, 114-116, 115f
 Sunrise Model, 114-116, 115f
 on transcultural nursing, 112, 115f, 264
 Lesbians, 274, 275b, 280, 349, 351t, 352-355, 353t-354t, 357-359
 Leukocytosis, 624
 Leukoplakia, 569
 Level of consciousness
 as risk factor for pressure ulcers, 1253, 1275t
 sensory impairments, 1253, 1275t
 Levels of health care
 diagnosis and treatment, 25
 disease and injury prevention, 25

- Levels of health care (*Continued*)
 health promotion, 25
 rehabilitation care, 25–26
 supportive care, 12, 26
- Levin sump tube, 1100–1107, 1104b, 1181–1184, 1185t
- Liability issues
 assault, 97
 battery, 97
 confidentiality breaches, 97–98
 criminal liability, 99
 false imprisonment, 98
 informed consent, 99–100
 intentional torts, 97–98
 invasion of privacy, 97–98
 medication errors, 98–99, 98b
 negligence, 96, 98–99, 98b
 torts, 97
 unintentional torts, 98–99
- Libido, 315–317, 417, 418b, 429, 429f
- Lice, 554–555, 557b, 834t, 861
- Licensed practical nurses (LPNs); *See also* practical nursing in Canada
 versus registered practical nurses (RPNs), 1373–1374, 1373t, 1383
 registration laws, 1373–1374, 1383
 statistics by province, 1378t
 statistics by specialty area, 1377t
 United States naming of, 1372
 workforce statistics and facts, 15–16, 16b, 1372
- Licensure
 evolution of Canadian practical nursing, 1372, 1373t
 registered nurse (RN), 95
- Life cycle stages
 affecting communication, 251b–252b, 252
 and family nursing, 282
- Life expectancy
 Canadian ranking in, 19
 statistics, 374–375
- Life support, 89–90, 89f, 103
- Life-saving measures, 189
- Lifespan
 evolution of self-concept, 397
 exercise recommendations, 784b
 and family nursing, 282
- Lifestyle
 as behavioural risk factor, 3–4, 6f
 and cardiopulmonary functioning and oxygenation, 887–889, 888b, 900–901
 as determinant of health, 5, 8–9
 and diabetes in Aboriginal peoples, 120–121
 and fluid, electrolyte, and acid-base imbalances, 947b–948b, 949, 951t–952t
 health history assessment of, 157b–158b
 and heart health, 582b
 and hypertension, 521–523
 middle age improvement efforts, 369
 of older adults, 375, 387b, 388–391
 as pillar of primary health care (PHC), 22b
 sensory losses and maintaining, 1321–1322
 and sleep, 1001–1002
 spirituality positively benefiting, 434–435
 and urinary incontinence, 1154–1155
 of vulnerable populations, 47–49, 48b
 during young adult years, 364–365
- Lifestyle behaviours
 Canada's ranking in, 19
 as risk factor, 3–4, 6f
- Lifting
 body position for, 783–785, 786b, 786f, 786t
 devices, 795b, 1230, 1232f, 1239f
 of patients, 1196, 1230b, 1232f, 1233b–1240b, 1233c, 1242f
- Ligaments
 determining body alignment and posture, 1196
 and physiology of movement, 771, 771f–772f
- Lighting
 aid vision-impaired, 1318–1319
 call lights, 796, 811t
 safe and adequate, 791, 809
- Limbic system, 475
- Linear questions, 284–285
- Linens, 868b–874b, 868f–869f, 871f, 873, 873f
- Lipid emulsions, 1107
- Lipids, 1052–1053, 1388t–1389t
- Lips, 568, 568f, 568t
- Liquid dosages
 measuring, 688, 693b–697b, 695f
- Listening
 active, 254, 256b
 caring shown through, 269, 269f
 as communication skill, 243
 to family, 277–278, 278b
 importance during delegation process, 135
 and silence, 255, 256b
- Listeriosis, 1079t
- Literacy, 5, 7, 304
- Literature
 data collection from, 158
- Lithotomy position, 544t, 597–599
- Liver
 anatomical location of, 595f
 diagnostic tests, 1337t, 1388t–1389t, 1396t–1398t
 palpation, 540t
 skin colour with diseased, 552t
- Living wills, 104
- Local anaesthesia, 1042, 1356–1357
- Localized infections, 622, 628–629, 632
- Logroll, 1223b–1229b, 1229f
- Loneliness
 in older adults, 385, 437b
- Lone-parent families, 274–275, 275b, 366
- Long bones, 770
- Long-term care (LTC)
 description of services/facilities, 377–378, 378b–379b
 documentation and reporting in, 220, 220b
 housing and environment, 23, 378b
 infections in older adults, 624–627, 626b, 628t
 as institutional sector setting, 23
 provisions in provincial and territorial plans, 19
- Loop colostomy, 1185, 1186f
- Lordosis, 604, 606f, 1197t
- Losses; *See also* death and dying; grief associated with aging, 377, 377b
 types of, 447–451, 448t, 456t
- Low-density lipoprotein (LDL) cholesterol, 582b, 1388t–1389t
- Lower extremity blood pressure cuff, 531, 531f
- Lower gastrointestinal barium enema, 1172b
- Lower urinary tract
 anatomy and physiology, 1113f–1114f, 1114–1115
- Low-flow devices, 925–928, 927t
- Lungs
 anatomical diagrams and landmarks, 573f–574f
 changes with aging, 380, 381t, 892t
 inspiration and expiration, 881
 normal sounds of, 577t
 physical assessment of, 573–578, 573f–576f, 575t, 577t–578t, 579b
 preoperative assessment of, 1336
 promotion and maintenance of expansion, 913–924
 respiration (*See* respiration)
 respiratory tests and methods, 895t
 sounds, 893, 893t
 ventilation, 513–521, 515b–517b, 880–882
 volumes and capacities, 881
- Lunula, 826–827, 827f
- Lying down
 correct body alignment while, 778, 1204–1208, 1208f
- Lymph fluid, 937
- Lymph nodes
 axillary and clavicular, 592–594, 592f
 inguinal, 589, 589f
 palpation of, 540, 540t
 physical assessment/examination of, 571–572, 571t, 572f, 589, 589f
- Lymphatic system
 examination of, 589, 589f
 laboratory values concerning, 629t, 1388t–1389t, 1393t, 1395t–1396t
 lymph fluid, 937
 lymph nodes (*See* lymph nodes)
- Lymphocytes, 624, 629t, 1393t
- M
 Maceration, 826t
 Macrobiotic diet, 753t–755t
 Macrodrrip, 974b–977b
 Macrominerals, 1053
 Macrosystems, 322, 322b
 Macular degeneration, 560b, 1304b
 Macules, 553, 554b
- Magnesium
 imbalances, 937t, 942, 943t–944t, 951t–952t
 laboratory values and possible etiologies, 1388t–1389t
 regulation, 940–941
- Magnetic resonance imaging (MRI)
 gastrointestinal, 1172b
- Male reproductive tract and genitals
 anatomical diagram of, 600f
 bathing procedures, 843b–850b, 847f
 changes during middle adulthood, 368, 369t
 changes in older adulthood, 381, 381t
 perineum, 1123
 physical assessment/examination of, 600–602, 600b, 600f–601f, 601t, 602b
 prostate gland, 1114f
 sexual response cycle, 418–419
 straight or in-dwelling catheter insertion, 1139b–1146b, 1140f–1142f, 1144f–1145f
- Male urinals, 1134, 1134f
- Malignant hyperthermia, 494, 502, 504b, 1360–1361
- Malignant wounds, 1268, 1268f
- Malnutrition
 in acute care setting, 392, 1063b
 assessment methods, 1067–1072, 1067f–1068f, 1070t–1071t
- Malpractice insurance, 101
- Management; *See* leadership and management
- Mance, Jeanne, 31, 32b
- Manipulative and body-based therapies, 752f, 753b, 753t–755t
- Manometers, 524–529, 524b–528b, 525f–526f, 528f, 529t, 531f
- Marriage, 363, 370
- Masked grief, 450
- Masked hypertension, 522–523, 523b
- Masks
 oxygen masks, 924–929, 925b–927b, 925f–926f, 927t, 928f–929f, 929b–932b, 929t
 protective, 103, 641b–643b, 641t, 644–645, 645b, 649, 652b–657b, 659
 1037–1038, 1037f, 1038b
- Mastication, 827, 1160–1162, 1161f, 1167, 1167t
- Material Safety Data Sheets (MSDSs), 794, 795f
- Matrix organizational structure, 131t
- Maturation, 317–319
- Maturation development, 312
- Maturation losses, 448, 448t
- Maturation stress, 478
- Maxillary sinuses, 567–568, 567f
- McEwan, Bruce, 473
- McGill Model, 59b–60b, 60
- McGill Model of Nursing, 3
- McGill University, 71, 72b, 73
- McMullen Art Gallery, 755, 756f
- Meals on Wheels, 385
- Measurements
 abbreviations in *Système Internationale d'Unités* (SI units) (*See* Appendix B)
 medication, 671–673, 672t, 673b
 Mechanical lifts, 1232t, 1233b–1240b, 1233t, 1239f
- Mechanisms of development, 310
- Mechanistic tradition, 321
- Mediastinal chest tube, 921b–924b
- Medical approach to health, 3
- Medical asepsis, 632–659
 bagging waste or linen, 641b–643b, 645
 cleaning, 633, 633b
 disinfection and sterilization, 633–634, 633b, 634t
 handwashing/hand hygiene, 635–639, 636b–639b, 652b–655b
 ports of entry and exit control, 634–635, 639–640
 reservoir control/elimination, 634, 634b
 routine practices and isolation guidelines, 640–644, 641b–643b, 641t
 specimen collection guidelines, 645, 646b
 transmission control, 635–639, 636b–639b
- Medical diagnosis
 definition of, 162–163
 versus nursing diagnosis, 162–163, 167
- Medical directives, 185–186
- Medical errors
 adverse events, 90, 96, 98–99, 98b, 105, 169–170, 170b, 225–226, 794
- Medical errors (*Continued*)
 Canadian ranking in, 19
 with medications (*See* medication errors)
 and negligence, 96, 98–99, 98b, 105
 prevention procedures, 795, 796b
 surgical, 1352–1354, 1353f
- Medical futility, 89–90, 89f
- Medical jargon, 246
- Medical misadventure, 19
- Medical records; *See also* documentation and reporting
 data collection from, 158
 electronic health records (EHRs)
 for care plans, 182
 challenges and advances in, 26, 229, 231
 documentation and reporting, 204, 220–223
 jurisdictional progress chart, 232f
 six core components of, 231
 handling and disposal of, 222–223
- Personal Information Protection and Electronic Documents Act (PIPEDA), 203, 236, 237b
- MedicAlert bracelets, 668f
- Medicare, 16
- Medication administration
 abbreviations, 669t
 age group considerations, 688–690
 charting guidelines, 207t, 210t
 child dosages, 674–675, 674f
 clinical calculations, 672–679
 critical thinking applied to, 679–684
 distractions and errors, 672, 673b, 680t
 dose calculations, 673–675, 673b, 674f
 errors, 672, 673b, 680t
 goals and expected outcomes, 692t
 legal issues, 102–103
 metric and household measurement systems, 671–673, 672t, 673b
 nursing process application to, 684–691
 assessment, 684–686, 684b–685b
 implementation, 686–690, 687b–688b
 nursing diagnosis, 686
 planning, 686, 692t
 patient rights (ten) regarding, 681–684, 682f
- polypharmacy, 390–391, 690b, 691f
- routes of administration
 body cavity route, 664t, 670–671, 670t, 704–705, 704b–707b, 704f
 buccal route, 664t, 669, 669f, 670t, 693b–697b
 epidural route, 670–671, 670t, 671f
 inhalation route, 664t, 670t, 671, 705–711, 708b–711b
 injections, 664t, 670–671, 670t, 711–713, 712f, 714b–719b, 722b–727b, 724f–725f, 735b
 intra-arterial, 664t, 670t, 671
 intra-articular, 671
 intracardiac, 671
 intradermal (ID), 664t, 670, 670t, 722b–727b, 734
 intra-ear, 671, 704–705, 704b, 704f
 intramuscular (IM), 664t, 670, 670t, 722b–727b, 731–732, 731f, 732b, 733f–734f
 intraocular, 671, 697–704, 700b–703b
 intraosseous route, 671
 intraperitoneal route, 664t, 670t, 671
 intrapleural route, 671
 intrathecal, 671
 intravenous (*See* intravenous (IV) therapy)
 metered-dose or dry powder, 664t, 670t, 671, 705–711, 708b–711b, 709f
 mucous membrane route, 664t, 670t, 671
 nasal instillation, 697, 699b–700b, 699f
 oral route, 664t, 669, 669f, 670t, 691–747, 692b–697b
 parenteral route, 664t, 670–671, 670t, 711–720, 711b, 711f–715f, 714b–719b
 rectal, 664t, 705, 707b, 707f
 subcutaneous, 664t, 670, 670t, 721–731, 722b–727b, 730f–731f
 sublingual, 664t, 669, 669f, 670t, 693b–697b
 topical route, 664t, 670t, 671, 692–705
 transdermal, 664t, 670t, 671
 vaginal, 664t, 705, 705b–706b, 706f
 subcutaneous butterfly catheters, 747, 748b–749b, 748f
- ten patient rights regarding, 681–684, 682f

- Medication administration record (MAR)
components and example of, 688b, 689f
errors, 680t
nurse reconciliation with, 694f
- Medication allergy, 667, 667t
- Medication errors
abbreviations, symbols and dose
designations errors, 676, 676t
distraction and, 673b
dosage or measurement errors, 673-675
error-prone conditions, 680t
ethics of admitting, 90
legal actions due to, 98-99, 98b
medication reconciliation process, 679,
681b, 694f
recommendations for reducing, 675b,
679b, 680t
safety interventions, 807b, 807f
ten rights to prevent, 679b, 681-684
- Medication interactions, 668
- Medication orders
components of, 688b
- Medications
actions and interactions, 667-668, 667t
adding to IV fluid containers,
727b-730b, 728f
adverse effects, 667
allergic reactions, 667, 667t
blood pressure influenced by, 522
causing bowel elimination problems,
1169, 1169t
Canadian drug legislation, 664
classification, 663
concentration levels, 668-669, 668f, 669t
control and regulation responsibilities,
665
and cultural health beliefs, 685b
definition and functions of, 662-672
dispensing systems, 677-678, 678f
dose calculations, 673-675, 673b
dose responses and schedules, 668-669,
668f, 669t
drug compliance, 687b
drug names, 663
drug standards, 664-665
errors, 672, 673b, 675b, 676t, 678-679,
679b, 680t, 681-684
causing fluid, electrolyte, and acid-base
imbalances, 947b, 949, 949b, 987
forms and routes of, 663-664, 663f, 664t
history during cardiopulmonary
assessment, 891-892, 892b
idiosyncratic reactions, 667
insulin preparation and injection,
719-720, 720b-727b, 720t
legal issues, 102-103
measuring liquid dosages, 688,
693b-697b, 695f
MediAlert bracelets, 668f
nutrient-drug interactions, 1064t
older adult issues, 390-391, 690b, 691f
order types, 669t, 675b, 676-677
pharmacokinetics
absorption, 666
distribution, 666
excretion, 667
metabolism, 666-667
polypharmacy, 390-391
prescriber's role, 675-677, 675b
pulse rates influenced by, 512t
reconciliation process, 679, 681b, 694f
review during health history
assessment, 157b-158b
side effects, 667
affecting sleep, 996-998, 997b, 1001,
1001b
teaching information regarding, 302,
302f
therapeutic effects, 667
toxic effects, 667
for urinary incontinence, 1136, 1137t
urination influenced by, 1116
- Medicine wheel, 121-122, 310b, 312f
- Meditation, 444b, 753t-755t, 757-759,
758b-759b
- Mediterranean diet, 753t-755t
- Medulla oblongata, 475, 882b, 883
- Megavitamin therapy, 753b, 753t-755t
- Melanoma, 550, 550b, 553, 555b
- Memory
assessment of, 609t, 611
changes with aging, 381t, 382-384
deficits in older adults, 379
loss with Alzheimer's disease, 383-384
- Men; *See also* male reproductive tract and
genitals
physical assessment/examination of,
600-602, 600b, 600f-601f, 601t,
602b
- Men (*Continued*)
prostate gland
anatomic location of, 1114f
sexual response cycle, 418-419
- Menarche, 354, 354t, 397
- Menière's disease, 1304b
- Menopause, 368, 369t, 372b, 493, 591b
- Mental health/ mental illness
adolescent issues, 48-49, 397, 400, 400b,
402b
crises techniques, 189
Epp Report on, 4, 5f
facilities, 24
and false imprisonment, 98
legal issues, 98, 104
Mini-Mental State Examination
(MMSE), 609-611, 610b
nursing awareness of, 47-49
sensory alterations affecting, 1304b,
1308
sleep hampered by, 995-996, 999b, 1002,
1005
spirituality positively benefiting,
434-435
in vulnerable populations, 47-49, 48b
- Mental status
legal issues, 98, 104
in older adults, 379-380
- Mentorship
of nursing students, 136-137, 136f
Mercury spills, 503b
- Meridians, 762
- Mesosystems, 321, 322b
- Messages, 245-246, 245f
- Metabolic rate, 883
- Metabolic system
benefits of exercise for, 774b
changes with immobility, 1199, 1210,
1210t, 1216-1217
and higher surgical risks in older adults,
1331t-1332t
- Metabolism
aging effects on medication, 688-690,
690b, 691f
definition of, 1055
in pharmacokinetics, 666-667
- Metaethics, 84
- Metaparadigm concepts, 56-58, 57f
- Metastasis, 592
- Metered-dose inhalers (MDIs), 664t, 670t,
671, 705-711, 708b-711b, 709f
- Methicillin-resistant *Staphylococcus aureus*
(MRSA), 1351
- Metis; *See also* Aboriginal peoples
demographics and population statistics,
119-120
Eating Well with Canada's Food Guide for,
1056, 1057f, 1058t
family and social beliefs of, 120
Metric system; *See also* Appendix A
abbreviations in *Système Internationale*
d'Unités (SI units) (*See* Appendix B)
dosage calculations, 671-673, 672t, 673b
- M-health, 26
- Microchip, 974b-977b
- Microorganisms
chain of infection, 619-626, 619f,
620t-621t
definition and types of, 618-626,
620t-621t
infection control, 618-619, 620t-621t
reservoir elements required for, 619-620
- Microsystems, 321, 322b
- Micturition
definition of, 1114
promoting regular, 1134-1135, 1134b
stimulating reflex of, 1134
- Midbrain, 475
- Middle adulthood/ middle-aged adults,
368-372
age period defining, 361-362, 368
aging parents/ caregiving
responsibilities, 370
anxiety and depression, 371
career changes, 369
family transitions, 370
obesity and physical inactivity concerns,
1062-1063
perimenopause and menopause, 368,
369t, 372b
physical changes during, 368, 369t, 775
respiratory tract infections, 888
sexuality, 369-370
teaching methods for, 295, 295b
wellness activities, 370-372, 371b,
1062-1063
- Middle childhood; *See* school-age
children
- Middle-range theory, 56, 57t
- Military time clock, 208, 208f
- Milk, 1057f, 1058t, 1060-1061
- Milk thistle, 764, 764t-765t
- Mind-body interventions
complementary and alternative
medicine (CAM), 753b, 753t-755t
traditional Aboriginal medicine, 753b
- Mind-body-spirit connection
in Aboriginal spirituality, 121-122, 753b,
753t-755t
and psycho-neuro-immunology, 435,
435b
- Minerals, 753b, 753t-755t, 1053
- Mini-infusion pumps, 741, 742b-747b, 746f
- Minimally invasive surgical techniques
(MIS), 1327
- Minimum Data Set (MDS), 1307
- Minority groups
awareness and vulnerable populations,
44-46, 48b
statistics in Canada, 109-110, 109f
- Missionary nursing, 31, 33, 33f
- Mitten restraint, 812b, 816f
- Mixed urinary incontinence
definition and treatment options, 1118,
1136b
nursing process case example to
diagnose, 1120-1156, 1131b-1133b
- Mobility; *See also* mobility and immobility
definition of, 1195-1196, 1198-1202
meaning of, 1212b
- Mobility and immobility
and activities of daily living (ADLs),
1196-1198, 1231
assessment
body alignment, 778, 778f, 1204-1209,
1209f
exercise and activity tolerance, 779,
783-785, 1209-1210, 1240b
gait, 779, 1209
range of motion (ROM), 778-779,
1203-1204, 1204f, 1204t-1208t
summary form, 1233t
assistive devices, 1241-1246, 1243f (*See*
also crutches)
bedpans, 1163-1164, 1164f
body mechanics principles and
physiology
alignment and balance, 773, 1196
gravity and friction, 772-774, 1196
crutches, 1243-1246, 1244b, 1244f-1247f
definitions of, 1195-1196, 1198-1202
developmental changes, 1202, 1212,
1221
disuse syndrome, atrophy, osteoporosis,
1200, 1211-1213
effects of, 783-785
and falls in older adults, 1196b, 1202,
1242f
instrumental activities of daily living
(IADLs), 1196-1198, 1231
moving and positioning patients in bed
bariatric patients, 1231b
logroll, 1223b-1229b, 1229f
prone position, 1222-1230,
1223b-1229b, 1227f
side-lying position, 1223b-1229b,
1228f, 1230, 1235f
Sims' position, 1223b-1229b, 1228f,
1230
supine position, 1222, 1223b-1229b,
1226f
supported Fowler's position, 1222,
1223b-1229b, 1225f
nursing process applied to
assessment, 1203-1212, 1203f, 1233t
evaluation, 1246-1247, 1247f
implementation, 1216-1246 (*See also*
procedures to treat hazards of
(below))
nursing diagnoses, 1212-1213, 1213b
planning, 1213-1216, 1213f,
1214b-1215b, 1216f
prioritizing goals and outcomes,
1213-1215
in older adults, 1196b, 1202, 1203b
osteoporosis, 1200, 1200b, 1211
pathological influences on
central nervous system damage,
1197-1198
direct trauma to musculoskeletal
system, 1198
impaired muscle development,
1196-1197
postural abnormalities, 1196, 1197t
positioning devices and techniques,
1221-1230, 1221f-1222f,
1223b-1229b
pressure ulcers, 1201, 1201b, 1211, 1220
- Mobility and immobility (*Continued*)
procedures to treat hazards of
acute care, 1216-1246
cardiac workload reduction, 1217
chest and lung expansion techniques,
1217
chest physiotherapy (CPT), 1217
continuous passive motion (CPM)
machine, 1219-1220, 1220f
enteral and parenteral feedings,
1216-1217
health promotion, 1216, 1231, 1240b
orthostatic hypotension reduction,
1217-1219
patent airway maintenance, 1217
pressure ulcer prevention, 1220
range of motion exercises, 1219-1220,
1220f, 1231-1246
thrombus and compression stockings,
1217-1219, 1218b-1219b,
1356-1357
psychosocial effects, 1202, 1211-1212,
1212b, 1220-1221
rehabilitation, 1199b
as skin impairment risk factor, 831b
systemic and physiological effects of,
1198-1201, 1199b, 1212-1213
cardiovascular changes, 1199, 1200f,
1210-1211, 1210t, 1217-1219
integumentary changes, 1201, 1201b,
1210t, 1211, 1220
metabolic changes, 1199, 1210, 1210t,
1216-1217
musculoskeletal changes, 1199-1200,
1200b, 1201f, 1210t, 1211,
1219-1220
respiratory changes, 1199, 1210, 1210t,
1217
urinary elimination changes, 1201,
1210t, 1211, 1220
transfer techniques and equipment,
1230-1231, 1230b-1231b, 1232f,
1233b-1240b
- Models for ethical decision making, 86-88,
87b
- Models for nursing
Florence Nightingale's, 55, 59b, 60,
435-436
- Models of care; *See also* Nightingale,
Florence
collaborative practice model, 129-130
continuity of care model, 128-129
emerging models, 129-130
for leadership and management,
126-130
primary nursing model, 129
team nursing, 129
traditional models of care, 129
- Modes of transmission, 619f, 621-622, 621t
- Modified autogenic relaxation, 758b
- Modular formulas, 1087-1100
- Moist wound dressings, 1281-1288,
1281b-1285b
- Molding, 330
- Monocytes, 624, 629t, 1393t
- Monounsaturated fatty acids, 1052-1053
- Montgomery ties, 1289-1290, 1290f
- Montreal Cognitive Assessment, 609-611
- Moral development theories, 313-315
Gilligan's Theory, 315
Kohlberg's Theory of Moral
Development, 315, 316t
Piaget's Theory of Moral Development,
314-315, 314t
- Moral distress, 90
- Moral integrity, 90
- Moral residue, 90
- Morals; *See* ethics
- Morals development
adolescent, 346t-347t, 348-349, 356
preschooler, 341-344
school-age children, 346t-347t, 348-349
- Mormons, 1065t
- "Morning after" pills, 421
- Mortality rates
Canadian ranking in, 19
- Morula, 327
- Moteller's formula, 674-675, 674f
- Motivation to learn, 296-298, 297t
- Motor skills
balance, 614, 614b
coordination, 613-614, 614b
- Motor vehicle accidents
adolescent, 356, 358t, 793
car seats, 801-803, 803t-804t, 805f
drunk driving accidents, 806, 806b
injuring infants, 333, 334b-335b
as leading cause of death in young
adults, 365

- Motor vehicle accidents (*Continued*)
 older adult, 793, 807b
 prevention, 340-341, 342t-343t
 trauma, 476-477, 476b
- Motorized lifts, 1232f, 1233b-1240b, 1233t, 1239f
- Mourning
 grief (*See* grief)
 nurse's role in facilitating, 462
- Mouth
 changes and infections in older adults, 624-627, 626b, 628t
 digestive role of, 1054, 1054f, 1160-1162, 1161f, 1167, 1167t
 infection defence mechanisms, 623t
 physical assessment/examination of, 568-570, 568f-571f, 568t, 569b, 1167, 1167t
 temperature measuring site, 495-500, 495b-500b
- Movement
 body mechanics, 773-774, 773b
 alignment and balance, 773, 1196, 1204-1209
 gravity and friction, 772-774, 1196
 nervous system role in, 772-773
 balance, 773
 proprioception, 773
 pathological conditions affecting, 774
 physiology of, 770-773
 joints, 770-771, 771f
 ligaments, tendons and cartilage, 771, 771f-772f
 skeletal muscles, 771-772, 772f
 skeletal system, 770-773
- Mucosal membranes
 affected by urinary incontinence, 1118b, 1122
 route of medication administration, 664t, 670t, 671
- Multiculturalism
versus assimilation, 111
 in Canada, 109-110, 109f
 statistics and legislation, 109-110, 111b
- Multidisciplinary communication, 203-204, 204f
- Multiple Sleep Latency Test (MSLT), 996
- Mummy restraint, 815b-819b, 817f
- Municipality Act of 1916, 17
- Muscle tone, 606b, 607-608, 608f, 773
- Muscles
 atrophy, 1198, 1200
 description and physiology of, 771-772
 exercise and body temperature, 493
 groups of, 772
 impaired development of, 1196-1197
 intramuscular (IM) injections, 664t, 670, 670t, 733-734, 734f
 and joint range of motion (ROM), 604-607, 606t, 607f-608f
 muscle tone, 606b, 607-608, 608f, 773
 and physiology of movement, 771, 771f-772f
 and posture, 772
 strength, 606b, 607-608, 608f, 608t
 weakness and paralysis, 1197-1198
- Muscular dystrophies, 1196-1197, 1197t
- Musculoskeletal system
 accident risks, 793b
 benefits of exercise for, 774b
 changes with aging, 381t, 382, 793b
 changes with immobility, 1199-1200, 1200b, 1201f, 1210t, 1211, 1219-1220
 general inspection of, 604
 impairments
 affecting chest wall movement and breathing, 883
 lordosis, kyphosis and scoliosis, 604, 606f, 1197t
 muscle tone and strength, 606b, 607-608, 608f, 608t
 physical assessment/examination of, 603-608
 postural abnormalities and immobility, 1196, 1197t
 posture and gait assessment, 604, 605f-606f, 605t, 606b
 range of motion (ROM), 604-607, 606t, 607f-608f
- Music therapy, 753t-755t, 758b, 1037
- Muslims
 cultural safety, 113b
- Muteness, 258, 259b
- Mutuality, 86
- Myasthenia gravis, 1077f
- Myocardial blood flow, 878, 878f
- Myocardial contractility, 879
- Myocardial infarction (MI), 879
- Myocardial ischemia, 886-887
- Myopia, 560b, 1304b
- N
- Nagele's rule, 327
- Nails
 abnormalities, 558b
 anatomical structure of, 827f
 caring for, 851-854, 852b-854b, 853f
 characteristics and assessment of, 555-557, 557t, 558b-559b, 558f, 827f, 893t
 clubbing, 587-588
 common problems of, 831-833, 832t
 hygiene, 826-827, 827f, 833-835, 851-854, 852b-854b, 853f
 ingrown and ram's horn, 832t
- NANDA; *See* North American Nursing Diagnoses Association (NANDA)
- Narcolepsy, 997b, 998, 1004b
- Narcotics
Narcotic Control Act, 102-103, 664-665, 665b
 sleep affected by, 1001, 1001b
- Narrative documentation, 208, 210b
- Narrative interactions, 249-250
- Nasal cannula, 924-929, 925b-927b, 929t
 925f-926f, 927t, 928f-929f, 929b-932b, 929t
- Nasal medication instillation, 697, 699b-700b
- Nasocentric tubes, 1088b-1096b, 1100b, 1100f
- Nasogastric intubation, 1088b, 1181-1184, 1185t
- Nasogastric suctioning, 1100-1107, 1104b-1106b
- Nasopharyngeal aspirate, 896b
- Nasopharyngeal suctioning, 905-912, 905b-911b
- Nasopharynx, 570, 570f, 1160, 1161f
- Nasotracheal suctioning, 905b-911b, 912
- National Association of PeriAnesthesia Nurses of Canada (NAPANC), 1326-1327
- National Consensus Project (NCP), 455-456
- National Pressure Ulcer Advisory Panel (NPUAP), 1261-1264, 1263b
- National Steering Committee on Patient Safety, 798-799
- Natural disasters, 476
- Natural health products (NHPs), 763-766, 764t-766t, 767b
- Naturopathic medicine, 753t-755t
- Nausea
 anorexia, 1078-1079
 postoperative, 1362, 1364t-1365t
- Nebulization, 901
- Necessary losses, 448, 448t
- Neck
 anatomical diagram of, 571f
 joint movement, 1204t-1208t, 1240
 lymph nodes, 571-572, 571t, 572f, 589, 589f
 physical assessment/examination of, 570-573, 571f, 571t
 thyroid glands, 540, 540t
- Needleless devices, 734-735, 743f
- Needles; *See also* injections; syringes
 description and types of, 711-720, 712f, 714b-719b, 716f
 with plastic guards, 734f
 "sharps" procedures, 734-735, 735b, 735f
- Needle-stick injuries
 prevention of, 735, 735b, 737b-741b
- Needs theories, 59b, 60-61
- Dorothea Orem's self-care theory, 59b, 60-61
- Virginia Henderson's human needs theory, 59b, 60
- Negative nitrogen balance, 1198
- Negative pressure wound therapy (NPWT), 1288
- Neglect
 elder abuse, 47-48, 385, 386b
 infant, 333, 336b
- Negligence
 legal actions due to, 96, 98-99, 98b
 prevention of, 98-99, 105
- Neonatal Facial Coding System (NFCS), 1028-1029
- Neonatal period/ neonates
 age period defining, 327b
 pain scales, 1028-1029
 sleep patterns, 338-339, 339t, 1000
- Nephrons, 1113, 1113f
- Nephrostomy, 1119
- Nervous system
 accident risks increasing with aging, 793b
 sensory nerve receptors, 1302-1305
- Nesting, 366, 367t
- Neuman, Betty, 61-62
- Neural regulation, 882b
- Neurological system
 behaviours, appearance and language indicators, 610-611
 changes with aging, 381t, 382
 cranial nerve function, 611, 612t
 delirium criteria, 609-610, 610b
 functions of, 608
 injuries, 514b
 and intellectual function, 611
 level of consciousness, 610, 610t
 mental and emotional status, 609-611, 609t, 610b
- Mini-Mental State Examination (MMSE), 609-611, 610b
- and motor function, 613-614, 614b
- pain experience, 1018-1021, 1018b, 1019f-1020f, 1020t, 1024
- physical assessment/examination of, 608-615 (*See also* neurological system)
- postoperative functional assessment, 1361, 1367
- preoperative assessment of, 1336
 reflexes, 614-615, 614f-615f, 615t
 sensory function, 611-613, 612f, 613t
 surgical risks, 1331t-1332t
- Neuromodulators, 1018b
- Neuromuscular diseases, 883
- Neuropathic pain, 1022, 1022t
- Neuropathy, 831, 1267-1268, 1267f
- Neurotransmitters
 and pain, 1018b, 1019f
- Neutrophils, 624, 629t
- New France
 nursing history, 30-31, 434
- Newborns
 acceptable respiratory rates in, 514t
 age period defining, 327b, 330
 cognitive development, 330
 health risks, 328-330, 329b, 334b-335b
 physical and psychosocial development, 328, 330-332, 331f
- Night crying, 339t
- Nightingale, Florence
 caring philosophy of, 263, 434
 early nursing research by, 71, 72b
 as founder of modern nursing, 32-34, 42-43, 434
 holistic approach of, 751-752
 on inequities affecting women, 55, 59b, 60
 models for nursing, 55, 59b, 60, 434-435
 on nutrition, 1051
 on pain, 1022
- Nine life-saving solutions, 796b
- Nitrogen balance, 1052
- Noiception/noiceptive pain
 description and classification, 1018, 1022, 1022t
 modulation, 1019
 perception, 1019
 transduction, 1018
 transmission, 1018, 1019f
- Nocturia, 807b, 996, 1118, 1121t
- Nocturnal polyuria, 1118
- Nodules, 553, 554b
- Noise
 controlling in acute care environment, 1320-1321
 pollution and excess, 565b, 792, 793f, 1305-1306, 1315-1316
 sensorineural hearing loss, 565b, 1304b, 1305, 1315-1316
- Nomograms, 674-675, 674f
- Nonadherent contact layer dressings, 1286t, 1287
- Non-English speaking patients, 246, 251b, 258-259, 259b
- Nonessential amino acids, 1052
- Nonmaleficence, 85
- Nonrapid eye movement (NREM), 993-994, 994b, 995f, 1000-1001
- Nonshivering thermogenesis, 491
- Nonsteroidal anti-inflammatory drugs (NSAIDs), 1039-1040, 1033t
- Nonstochastic theories, 376
- Nontherapeutic communication techniques, 257-258
- Nonverbal communication
 cultural assessment of, 117t, 118
 with families, 283
- Nonverbal communication (*Continued*)
 with touch, 268-269
 types of, 247-248
- Nonviable tissue, 1261
- Normal flora, 622-623
- Normal sinus rhythm (NSR), 880
- Normative ethics, 84, 86
- North American Nursing Diagnoses Association (NANDA), 59, 59b, 162-168, 164b, 166t-167t, 170, 196, 196t
- Northern Pain Scale, 1028, 1030f
- Norwalk virus, 1168
- Nose
 hygiene, 827, 833, 865
 nasal medication instillation, 697, 699b-700b, 699f
 and sinuses
 physical assessment/examination of, 564b, 565-568, 567f, 567t
- Nosocomial infections, 392, 624
- "Now" orders, 669t, 677
- Numbering phase, 449-450, 449t
- Numerical rating scale (NRS), 1028-1030, 1030f
- Nurse practitioners (NPs)
 regulations, 95
 workforce statistics and facts, 15-16, 16b
- NurseOne, 40, 239, 538-539
- Nurses; *See also* nursing
 Canadian workforce statistics and facts, 15-16, 16b, 1372
 defining role of, 29, 40-41
 degree programs, 40
 education and schools, 34-40, 35b
 hospital-based, 23
 nurse-patient relationships
 helping/positive communication skills, 248-250, 249b
 spiritual care facilitation by, 434, 434b, 438-441, 438f, 439b, 443-445, 443b-444b, 443f
 spirituality self-reflection, 440-441, 440b, 443b
- Nurse-sensitive client outcomes
 definition of, 177, 177t
 evaluation of, 195-196, 196b
 as measurable quality indicators of nursing care, 135, 177
 standards of care, 135, 236b
- Nursing; *See also* practical nursing in Canada
 Canadian history of, 30-33, 32b, 33f, 434
 Canadian workforce statistics and facts, 15-16, 16b, 1372
 caring as foundation of, 262-263, 265, 270-271, 434
Code of Ethics on end-of-life decision making, 455
 community health (*See* community health nursing practice)
 defining role of, 29, 40-41
 degree programs, 40
 developmental theories, 310, 323-324
 education and schools, 34-40, 35b
 evolution and history of Canadian, 16-19, 16b, 434
 future of Canadian, 27, 130, 1384-1386
 gender and diversity trends in, 34, 37
 globalization and emergence of modern, 33-34
 guiding principles of French-Canadian, 40-41, 434
 historical origins of, 30-33, 434
 leadership and management in (*See* leadership and management)
 legal issues (*See* legal issues)
 missionary nursing, 31, 33, 33f, 434
 organizations, 35-37, 37f
 parish, 25, 434
 philosophy of profession, 29-30, 40-41, 434
 quality care and patient safety goals of, 135-136, 136b
 registered and practical categories, 1372-1374
 regulatory bodies, 95, 1382-1383
 religious origins of, 30-34, 32b, 33f, 434
 remote nursing, 33-34
 role in health care policy-making, 11-12, 20, 51
 self-concept facilitation, 396, 403-412, 406f, 408f, 410f, 412f
 spirituality awareness, 434, 434b, 438-441, 438f, 439b, 443-444
 standards of care, 95-97
 statistics by specialty area, 1377t
 Nursing care plans; *See* care plans; planning

- Nursing diagnoses**
 case study examining process of, 153-172, 162f, 167f, 169f
 CNA competencies for RNs, 164-165
versus collaborative problems, 163, 165f
 communication skills needed during, 244b, 253
 components of, 154f, 163f, 166-168, 167t
 concept maps, 168-169, 169f
 critical thinking and, 162-168, 163f
 definition of, 162-163
 definition of nursing process, 153-154, 154f
 diagnostic labels, 166-167, 167t
 diagnostic reasoning, 165-168, 167f, 168t
 formulation of, 166
 health promotion, 166
 link to Nursing Outcomes Classification (NOC), 196, 196t
 NANDA International diagnoses
 examples, 164b, 165-168, 166t-167t
 from physical assessments, 539, 540t
 priority setting, 174-175, 174f, 176f
 related to spirituality, 435-436
 relationship with goals, expected outcomes and interventions, 175-178, 176f
 risk, 166
 regarding self-concept, 407-408, 407b
 theoretical foundations for, 55, 59
 wellness, 166
 Nursing fiduciary responsibilities, 94-97
 Nursing history
 baccalaureate entry-to-practice, 37-38
 during British regime, 31
 Canadian heritage of spirituality, 433-435, 438-441
 CNA School Improvement Program, 38
 cultural competence evolution, 111-114
 early highlights of Canadian, 30-33, 32b, 434, 1373t
 early nursing theory emergence, 55, 60, 434
 educational advances and reform, 34-40, 35b-36b
 Ethel Johns, 126, 127b
 Florence Nightingale, 32-34, 434
 globalization and emergence of modern, 33-34
 from Great Depression to post-World War II years, 39-40
 Grey Nuns, 31-33, 33f, 434
 Jean I. Gunn, 36b
 Jeanne Mance, 31, 32b
 Mary Agnes Snively, 35-36, 35b
 missionary nursing, 31, 33, 33f, 434
 in New France, 30-31, 434
 of practical nursing in Canada, 1371-1375, 1373t
 religious origins of, 30-34, 32b, 33f, 434
 Royal Commission on Health Services, 37-38
 The Weir Report, 37
 Nursing homes, 23-24, 377-378, 378b-379b
 Nursing informatics (NI)
 Canadian Nursing Informatics Association (NCIA), 239-240, 239b
 challenges in Canadian health system, 26
 creating positive attitudes toward, 238b
 definitions associated with, 228-229, 230t-231t, 233, 234t
 eCOP creating interest in, 238b
 E-Nursing Strategy for Canada, 237-239
 evolution in Canadian health care system, 229-231, 230t-231t
 Health Information: Nursing Components (HIN:NC), 233, 234t
 International Health Terminology Standards Development Organization (IHTSDO), 234
 and medication safety, 679b
 privacy concerns and legislation, 235-237, 237b
 standards, 231-235, 232b
 Nursing information systems, 222-223
 Nursing intensity
 HIN:NC definition of, 233, 234t
 Nursing interventions; *See* interventions
 Nursing Interventions Classification (NIC), 178-182, 180t-181t, 183b, 186, 186b, 300b
 Nursing Outcomes Classification (NOC), 196, 196t
 linkage to NANDA diagnoses, 177, 177t, 183b
 Nursing practice acts, 96
 Nursing practice councils, 132-133
- Nursing process**
 assessments (*See* assessments; physical assessments and examinations)
 communication throughout, 244b, 251
 assessment, 251-253, 251b
 implementation, 253-258
 nursing diagnosis, 253
 planning, 253
 critical thinking within framework of, 142, 143f, 147, 147f, 149-150, 149b, 150f
 definition and diagrams illustrating, 153-154, 154f-155f
 diagnosis (*See* nursing diagnosis)
 evaluation, 153-154, 154f, 193-194
 five steps of, 153-154, 154f-155f
 implementation, 185-189, 186f (*See also* implementation)
 planning, 173-178, 174f-176f, 176t-177t
 research process, 73, 73t
 theoretical foundations for, 55-56
Nursing research
 basic steps in, 73, 73t
 best practice guidelines, 66-70, 66b, 73t, 78
 on caring behaviours, 267, 267t
 case studies (*See* "Research Highlight" boxes)
 clinical and "PICO" questions, 66-70, 66b, 73t
 data obtained from patient records, 206
 definition of, 71
 designs, 74-77
 ethical principles guiding, 77-78, 77b, 91b
 and evaluation in community health nursing, 51
 evidence collection/critiquing/
 integrating, 66-70, 66b, 68b, 68f
 evidence-informed practice based on, 65-66, 66b, 70, 78
 Hierarchy of evidence, 67-68, 68f
 historical milestones, 71-73, 72b
 and hypothesis, 73, 73t
 knowledge development patterns
 emancipatory knowing, 70t, 71
 empirics, 70, 70t
 esthetics, 70, 70t
 ethics and dilemmas, 70t, 71
 personal knowledge, 70, 70t
 qualitative
 ethnography, 75-76
 grounded theory, 76-77, 76b
 phenomenology, 76
 quality assurance and improvement studies, 77, 77f
 quantitative, 74-75
 data analysis, 75
 descriptive survey designs, 75
 experimental research, 73t, 74-75
 exploratory descriptive designs, 75
 quasi-experimental research design, 73t, 75
 scientific literature databases, 67-68, 68b
 scientific method, 73-74, 73t
 study components, 68-69
 training and doctoral programs, 71-73, 72b
Nursing Research, 59b, 71, 72b
 Nursing Research Fund, 69, 72b, 73
 Nursing schools; *See* education
Nursing science
 philosophy of, 55, 58
Nursing students; See also education
 career planning and mentorship, 136-137, 136f
 Donner-Wheeler Career Planning and Development Model, 136-137, 136f
 leadership and management skill development, 136-137, 136f
 legal issues for, 100-101
Nursing theory; See also theoretical foundations
 definition of, 54, 56t
 early emergence of, 55
 regarding spirituality, 435-436, 438f
Nurturing; See also caring
 geriatric nursing, 375
 Nutrient density, 1052
Nutrients
 definition of, 1051-1059
Eating Well with Canada's Food Guide, 1056-1058, 1057f, 1058t
 metabolism and storage, 1055
Nutrition
 adolescent, 346t-347t, 351-352, 351b, 351t, 1061-1062
 assessment methods, 1067-1072, 1067f-1068f, 1070t-1071t
Nutrition (Continued)
 as basic human need, 791, 808-810
 breastfeeding, 335-337, 351b, 1059-1060
 Canadian food-providing programs, 1078b
 Canadian obesity statistics, 1051
 affecting cardiopulmonary functioning, 888, 888b
 cultural variances regarding, 1066b
 as determinant of health, 5, 8-9
 dietary guidelines, 1056-1059, 1057f, 1058t
Eating Well with Canada's Food Guide, 1056-1058, 1057f, 1058t
 enteral (*See* enteral nutrition)
 evaluation, 1081, 1081f
 and growth and development, 311t, 312-313, 1059-1067
 health promotion and illness prevention, 1077-1078
 immobility affecting, 1198
 implementation, 1077-1081, 1079b-1080b, 1079t
 infant, 335-337, 351b, 1059-1061
 infection control and, 627, 628t
 as medicine in complementary and alternative medicine, 753t-755t, 762-766
 myasthenia gravis concept map, 1077f
 nursing diagnosis, 1072-1074, 1074b-1076b
 nutrient-drug interactions, 1064t
 obtaining dietary history (Acronym: FASTCHECK), 1069, 1070t
 older adult, 389, 1063-1065, 1063b, 1064t
 parenteral (*See* parenteral nutrition)
 planning, 1069b, 1074-1077, 1075b-1076b, 1077f
 poverty and other barriers to good, 1077-1078, 1078b
 pregnancy, 328, 329b
 preschooler, 344-345, 1060
 and pressure ulcers, 1256-1257, 1256t, 1260t-1261t, 1275t
 religion-based dietary restrictions, 1065t
 school-age children, 346t-347t, 351-352, 351b, 351t, 1061
 screening, 1068, 1068f
 and skin impairments, 831b
 support with fluid, electrolyte, and acid-base imbalances, 987
 as surgical risk factor, 1330
 toddler, 341, 1060-1061
 withdrawal in futile situations, 90
Nutrition for Health: An Agenda for Action, 1059
 Nutritional assessment, 1067f-1068f, 1068, 1070t-1071t
 Nutritional labels, 1058-1059, 1059f
 Nutritional screening, 1068, 1068f
 Nystagmus, 562
O
Obese patients
 higher surgery risks in, 1330-1332
 moving and positioning, 1231b
Obesity
 in Aboriginal population, 120-121, 1051
 adolescent, 357, 776, 1061-1062, 1062b
 as behavioural risk factor, 3-4, 6f
 Canadian ranking in, 19
 Canadian statistics, 19, 1051
 and cardiopulmonary functioning, 888, 888b
 affecting chest wall movement and breathing, 883
 classification of, 548, 549f
 and diabetes in Aboriginal people, 120-121, 1051
 exercise promotion in schools, 776
 and hypertension, 521-523
 middle adulthood, 370-372
 mobilizing bariatric patients, 1231b
 overfeeding of infants, 337
 in school-age children, 351t, 352, 776
 screenings according to age, 545t-546t
 sleep problems due to, 996b-997b
 and urinary incontinence, 1154-1155
 Obesity-hypoventilation syndrome, 883
 Object permanence, 340
Objective data
 guidelines for charting, 207-208, 207t
versus subjective data, 156
Observation of behaviours
 during communication, 254
 as data collection method, 160
 during physical exam process, 546-548
Obstructive sleep apnea (OSA), 996b-997b, 997-998
- Occlusion**, 583, 584f
Occupational health, 25, 365
Odour
 body, 541, 542t
 feces, 1171t
 foot, 832t
 fungating wound, 1268-1269, 1268f
 halitosis, 833, 854
 olfactory sense assessment, 1308, 1309t
 urine, 1123-1124
 wound infection, 1257, 1257b
Official Languages Act, 111b
Ojibway (Anishinabe), 442t
Older adults
 abuse (*See* elder abuse)
 acute care, 392-393
 age period defining, 374-375
 aging theories, 376-377
 "aging well" and quality of life, 377, 377f, 380-382
 Alzheimer's disease, 383-384
 autonomy stress in (*See* autonomy)
 behavioural signs of sensory deficits in, 1308, 1309t
 body temperature, 492-493, 534b
 bowel elimination, 1167, 1167t
 breast changes in, 591b
 cardiopulmonary issues, 888, 888b, 892-893, 892t
 caregivers for, 275-276, 276b, 370
 challenges and functionality issues, 375, 381t, 382
 characteristics of, 276b
 cognitive changes in, 382-384, 383b, 383t
 communicating respectfully with, 250, 252, 252b
 community-based and institutional settings for, 377-378, 378b-379b
 constipation, 1172, 1173f, 1174b
 death (*See* death and dying)
 dehydration in, 379-380, 392, 948b
 delirium, 382-383, 383b, 383t
 dementia, 383-384, 383t
 depression, 383t, 384
 developmental tasks for, 377, 377b
 elder abuse, 47-48, 385, 386b, 547b-548b, 548
 "elderspeak", 243, 250-252
 exercise benefits and recommendations, 388-389, 390f, 775, 775b, 784b
 falls (*See* falls)
 family support for, 275-276, 276b, 370
 functional changes in, 375, 381t, 382
 affecting health care costs, 19, 26
 as health determinant, 5, 8
 health promotion programs/techniques for, 387b, 388-392
 arthritis, 389-390
 body image interventions, 392
 cognitive stimulation, 392
 exercise, 388-389, 390f, 784b
 fall prevention, 390, 393b
 medication use and polypharmacy, 390-391, 690
 pain, 390
 therapeutic communication, 391
 touch, 391, 391b
 hearing loss, 380-382, 381t, 835, 1305-1306, 1305b
 housing and environment, 23, 377-378, 378b-379b, 386-387
 hygiene assistance, 835-836, 836f, 841-873, 842b-850b, 852b-860b, 853f
 immobilization effects on, 1196b, 1202, 1203b
 incontinence (*See* fecal incontinence; urinary incontinence)
 independence
 coping with loss of, 377, 377b
 desires and sensory assistive devices, 1310, 1310b
 fostering self-esteem, 317-319, 319f
 sensory function affecting, 1302
 infection control issues for, 626b, 627-629, 628t
 kidney and bladder function changes in, 1120
 learning needs of, 376, 376b
 lighting importance for, 791, 809
 loneliness, 385, 437b
 long-term care (LTC) facilities for, 23
 medication issues, 390-391, 688-690, 690b, 691f, 1064t
 middle adulthood caregiver responsibilities, 370
 myths and stereotypes, 257, 375-376
 needs assessment, 276b, 378-387, 379b

- Older adults (*Continued*)
 nutrient-drug interactions, 1064t
 nutritional needs and issues, 389, 1051, 1063–1065, 1063b, 1064t
 osteoporosis
 with aging, 380, 381t
 description and assessment of, 604, 605t, 606b
 exercise benefits, 774–775
 immobility and, 1200, 1200b, 1211
 pathological fractures with, 770
 pain, 1022–1026, 1023b, 1025t
 physical examination of, 543, 544b
 physiological changes with aging, 380–382, 381t, 388–391, 775
 polypharmacy, 390–391, 688–690, 690b, 691f
Prevention of Falls and Fall Injuries in the Older Adult, 796
 protecting veins and skin during IV therapy, 973b
 psychosocial changes and support
 needs of, 384–387, 391–392
 quality of life, 377, 377f, 380–382
 respect and dignity awareness, 250–252, 252b, 376
 restorative care, 393–394
 retirement, 377f, 384–385
 safety threats and interventions, 793–794, 806–807, 807b, 807f
 self-care hygiene assistance, 835–836, 836f, 841–873, 842b–850b, 852b–860b, 853f
 self-concept, 397, 403, 404b, 405f
 self-esteem, 317–319, 319f
 sensory function changes, 1305–1306, 1305b, 1321b
 sexuality, 385–386, 417–418, 418f
 skin issues, 833, 1251b
 sleep problems, 1001, 1010b
 social isolation, 385, 437b
 social safety net for, 16
 socialization with hearing loss, 1321–1322, 1321b
 spending statistics, 19, 26
 spirituality in, 434–438, 437b
 statistics in Canada, 374–375, 396
 stereotyping, 257, 375–376
 stressors unique to, 475b, 477–478, 478b
 supporting through education, 291b
 surgery risk factors for, 1330, 1331t–1332t
 tai chi to improve balance in, 756b, 784b, 787b
 teaching methods for, 295, 295b, 383b, 385
 terminology, 375
 touch therapy benefiting, 753t–755t, 755b
 urinary elimination issues for, 1120, 1121b, 1136b, 1154b
 urinary incontinence conservative therapies, 1154b
 vision changes in, 380, 381t, 1305–1306, 1305b
 vital sign changes in, 492–493, 534b
 wellness programs for, 387b, 388–391
 Olfactory sense/olfaction; *See also* odour
 aging and, 1305–1306
 definition of, 1301
 loss adjustment, 1317–1319
 skills needed in physical assessments, 541, 542t
 Oliguria, 1115, 1121t
 One-Day-At-A-Time medicine organizer, 806, 807f
 One-time orders, 669t, 677
 Ontario Training Centre in Health Services and Policy Research, 73
 Open gloving, 652–659, 657b–659b
 Open-ended questions, 159, 159b, 543
 Operating Room Nurses Association of Canada (ORNAC), 1326–1327
 Operating room nursing
 history of, 1326–1327
 Operating rooms (ORs)
 admission to, 1355
 temperature control, 1360–1361
 transport to, 1355
 Operational definition
 defining in scientific theorizing, 54, 56t
 Ophthalmic medications, 671, 697–704, 700b–703b
 Ophthalmoscope, 542, 562, 562f
 Opioids, 1039–1040, 1044, 1046b, 1169t, 1177b–1178b
 Oral hygiene; *See also* dental health
 in children, 348, 351t
 early childhood tooth decay (ECTD), 1060
 Oral hygiene (*Continued*)
 health risks with poor, 837t
 mouth assessment, 568–570, 568t, 571t
 problems associated with bad, 827, 827f, 833
 procedures and goals, 827, 827f, 835, 854–861, 855b–860b
 and tooth anatomy, 827f
 in young and middle-aged adults, 1062–1063
 Oral medications, 664t, 669, 669f, 670t, 688, 690b, 691–747, 693b–697b
 Oral mucosa, 568–570, 568t, 569f
 Oral tubes
 for enteral feeding, 1088b–1092b
 Orem, Dorothea, 59b, 60–61
 Organ donations, 104
 Organicism, 311–315
 Organogenesis, 327–328
 Organs
 of abdomen, 595f, 596
 digestive system, 1053–1056, 1054f, 1160–1162, 1160f–1161f
 palpation of, 540, 540t
 Orgasm, 418–419, 424, 424t
 Orlando, Ida, 59b
 Orogastic suctioning, 1100–1107, 1104b–1106b
 Oropharyngeal suctioning, 905–912, 905b–911b
 Orotracheal suctioning, 905b–911b, 912
 Orthopnea, 890
 Orthostatic hypotension, 523, 1199, 1217–1219
 Osmolality, 939–940, 940f
 Osmolar imbalances, 944t
 Osmolarity, 971–972, 971t
 Osmoreceptors, 939–940
 Osmosis, 938, 938f
 Osmotic pressure, 938
 Osteoporosis
 with aging, 380, 381t
 description and assessment of, 604, 605t, 606b
 exercise benefits, 774–775
 immobility and, 1200, 1200b, 1211
 pathological fractures with, 770
 Ostomies
 Hartmann's pouch procedure, 1186f
 irrigation and care of, 1186–1187, 1187f, 1189b–1192b
 nutritional considerations with, 1188
 pouch products, 1187–1188, 1188f, 1189b–1192b, 1190f–1191f
 pouching, 1187–1188, 1188f, 1189b–1192b, 1190f
 psychological and body image issues with, 1186
 sample teaching record, 1187f
 types of, 1184–1185, 1186f
 urinary diversions, 1119, 1119f
 Otitis media, 1304b
 Otolaryngologists, 1305
 Otosclerosis, 1304b
 Otoloscope, 542, 565
 Ototoxicity, 565, 1310
 Ottawa Charter for Health Promotion, 4, 5f, 10–13, 21–22
 Outcomes
 classification of nursing, 177, 177t, 183b
 communication, 253
 definition of, 195–196
 evaluating expected, 193–198, 194f, 196t, 198t
 HI:NC definition of, 233, 234t
 nurse-sensitive, 135, 195–196, 196b
 Nursing Outcomes Classification (NOC), 196, 196t
 planning expected, 175–178, 175f–176f, 176t–177t, 195–198, 196t, 198t
 revising, 198–199
 transformational leadership practices, 126, 127f
 Outpatients
 ambulatory surgery
 description of, 1327, 1335b
 Postanesthesia Recovery Score for Ambulatory Patients (PARSAP), 1359, 1359t
 postoperative instructions, 1359–1369, 1360b
 settings of care for, 23–24
 Outreach
 in community health nursing, 51
 Ovarian cancer, 545t–546t, 598, 598t, 600b
 Overactive bladder syndrome, 1118, 1136b
 Overflow incontinence, 1118, 1136b, 1137t
 Ovo-lacto vegetarian diets, 1065–1067
 Ovulation, 354t
 Oximeter probe, 520f
 Oxygen
 basic requirement for, 791, 808–810
 and cardiopulmonary system, 877–935
 respiration, 513–521
 respiratory gas exchange, 881–882
 supply and delivery of, 924–929, 925b–927b, 925f–926f, 927t, 928f–929f, 929b–932b, 929t
 therapy and combustion risks, 925b
 Oxygen masks, 924–929, 925b–927b, 925f–926f, 927t, 928f–929f, 929b–932b, 929t
 Oxygen saturation, 515b–520b, 517, 520f, 944–945; *See also* Appendix B
 Oxygen transport, 882
 Oxygenation; *See also* Appendix B
 aging and, 892t
 and chest wall movement, 883–884
 factors affecting, 882–884
 maintenance and promotion of, 924–929
 oxygen supply and delivery, 924–929, 925b–927b, 925f–926f, 927t, 928f–929f, 929b–932b, 929t
 physiological processes affecting, 882–884, 882t
 physiological processes of, 882–884, 882b
 tests, 896b, 1388t–1389t
 as vital sign, 515b–520b, 517, 520f
 P
 "Pacemaker"
 sinoatrial (SA) node as heart's, 879–880
 Pain, 1017–1049; *See also* pain management
 activities of daily living (ADLs) influenced by, 1032, 1032b
 behavioural responses to, 1020–1021, 1028–1029, 1031b
 biases and misconceptions regarding, 1022–1026, 1023b, 1024t–1025t
 causing bowel elimination problems, 1168
 characteristics of, 1027–1032, 1029t
 chest, 890
 and compassion, 439, 1018, 1022–1026, 1042–1043
 components of, 1018–1022
 definition of, 1017
 and delirium, 383b
 in dying patients, 463–465
 ethical responsibilities regarding, 1018, 1022–1026
 expressions of, 1027
 factors influencing
 anxiety, 1025
 cultural factors, 1025–1026, 1026b
 physiological factors, 1023–1024, 1023b, 1024t–1025t
 psychological factors, 1025
 social factors, 1024
 spiritual factors, 1024
 gate-control theory of, 1019–1020
 infant, 1022–1026, 1023b, 1024t
 inflammation causing, 624
 intensity scales and tools, 1028–1030, 1029t, 1030f
 nature and perceptions of, 1018–1022
 nociceptive
 description and classification, 1018, 1022, 1022t
 modulation, 1019
 perception, 1019
 transduction, 1018
 transmission, 1018, 1019f
 nursing ethical responsibilities regarding, 1018, 1022–1026
 nursing process applications to
 assessment, classification, and rating, 1026–1032, 1027b–1028b, 1027f, 1029t, 1030f, 1031b
 evaluation, 1046–1047, 1046f, 1047b
 implementation and interventions (*See* pain management)
 nursing diagnosis, 1032–1033, 1032b
 planning pain management, 1033, 1033f, 1034b–1035b, 1035f
 in older adults
 biases and misconceptions regarding, 1022–1026, 1023b, 1025t
 management, 390
 physical manifestations of, 1021
 physiological responses to, 1020, 1020t
 physiology and neurophysiology of, 1018–1021, 1018b, 1019f–1020f, 1020t
 postoperative assessment of, 1362, 1364t–1365t, 1366
 protective reflex response, 1019, 1020f
 Pain (*Continued*)
 pulse rates influenced by, 512t, 513
 relief as human right, 1018
 respiration influenced by, 514b, 520
 sexual disorders, 424, 424t, 1032
 spinothalamic pathway, 1018, 1019f
 spiritual care aiding, 445–446, 445b
 surgery, 1362, 1364t–1365t, 1366
 types of, 1021–1022
 acute pain, 1021
 breakthrough pain, 1022, 1045b
 cancer pain, 1021–1022, 1043–1045, 1044b–1045b, 1044f
 centrally generated pain, 1022, 1022t
 chronic pain, 1021
 cutaneous or superficial, 1029t
 idiopathic pain, 1022
 incident pain, 1022
 by inferred pathology process, 1022, 1022t
 neuropathic pain, 1022, 1022t
 nociceptive pain, 1022, 1022t
 peripherally generated pain, 1022, 1022t
 referred pain, 1021–1022, 1029t
 somatic pain, 1022, 1022t
 visceral pain, 1022, 1022t, 1029t
 Pain management; *See also* pain
 acute pain management
 adjuvants, 1040
 analgesics, 1024, 1039–1043, 1039b–1041b, 1041f
 coanalgesics, 1040
 epidural analgesia, 1042–1043, 1042f, 1043t, 1356
 local and regional analgesics and anaesthetics, 1042, 1356–1357
 nonsteroidal anti-inflammatory drugs (NSAIDs), 1039–1040, 1333t
 nursing support during, 1042–1043
 older adults, 390, 1022–1026, 1023b, 1025t
 opioids, 1039–1040, 1044, 1046b
 pain clinics, palliative and hospice care, 1046
 patient-controlled analgesia (PCA), 1023b, 1040, 1040b–1041b
 reducing pain perception and environment, 1038–1039, 1039b
 regional anaesthesia, 1042
 sucrose for infants, 1028b, 1041
 topical analgesics and anaesthetics, 1041
 WHO's pain relief ladder, 1043–1045, 1044f
 barriers to effective, 1045–1046, 1045b
 chordotomy and dorsal rhizotomy, 1043
 disease/procedure-related, 1043–1046
 for dying patients, 463–465
 establishing a collaborative team approach to, 1047b
 holistic and nonpharmacological techniques
 acupuncture, 753t–755t, 762, 762f, 1037
 biofeedback, 1037
 cognitive-behavioural, 1036
 cold and heat applications, 1038
 cutaneous stimulation, 1037–1038
 distractions, 1037
 health promotion techniques, 1036–1039
 massage therapy, 752f, 753b, 753t–755t, 1037–1038, 1037f, 1038b
 music therapy, 1037
 Reiki, 1037
 relaxation/imagery therapy, 484–485, 757–759, 758b, 1036–1037, 1036b
 therapeutic touch, 753b, 753t–755t, 755b, 761, 761f, 1037–1038
 transcutaneous electrical nerve stimulation (TENS), 1037–1038
 invasive interventions, 1043
 Pain threshold, 1019–1020
 Pain tolerance, 1020–1021
 Palate, 570, 570f, 1160, 1161f
 Palliative care
 coverage of, 19–20
 hospice, 25–26, 462–469
 pain management, 1046
 purpose and goals of, 462–469
 Palpation; *See also* individual body systems
 abdomen, 540, 597, 597f
 blood pressure, 530–531, 530b
 breasts, 589–594, 590b–591b, 591t, 592f–594f, 593b

- Palpation (*Continued*)
 during cardiopulmonary assessment, 893, 893t
 carotid artery, 583-584, 583f
 heart, 580-581, 580f-581f
 maxillary sinuses, 567-568, 567f
 procedures and characteristics measured by, 540, 540t, 541f
- Pancreas, 1054f, 1160f, 1161
- Pancreatitis, 597
- Pandemic planning, 24
- Papanicolaou (Pap) smears, 599, 600b
- Papules, 553, 554b
- Papyrus Ebers, 30
- Paradigms, 58-59, 73
- Paralytic ileus, 596, 596b, 1168, 1362, 1364t-1365t
- Paraphrasing, 256
- Paraplegia, 1197-1198
- Parasomnias, 996, 997b, 998-999
- Parasympathetic pain stimulation, 1020, 1020t
- Parenteral nutrition
 complications, 1108-1109, 1109t
 feedings for immobile patients, 1216-1217
 indications and initiation of, 1107-1109, 1107b
 medications, 664t, 670-671, 670t, 711-720, 711b
 peripherally inserted central catheter (PICC) insertion, 1107-1109, 1108f
 route of medication administration, 664t, 670-671, 670t, 711-720, 711b, 711f-715f, 714b-719b
- Parenthood
 child-bearing cycle, 363, 363b
 preparation for, 363-364, 363b
 and sexual activity, 363
- Parents
 adolescent relationships with, 346t-347t, 348-349
 promoting exercise and physical activity, 777
 school-age child's relationship with, 346t-347t, 348-349
- Parish nursing, 25
- Paronychia, 558b, 832t
- Parse, Rosemarie, 59b, 62
- Partial bed bath, 841-854, 843b-850b
- Partial pressure of carbon dioxide (PaCO₂), 942-945, 946t
- Partial pressure of oxygen (PaO₂), 942-945, 946t
- Partial thickness wound repair, 1262t-1263t, 1264-1266
- Passive or aggressive responses, 258
- Passive relaxation, 757, 758b
- Pastoral care, 441b
- Patellar tendon reflex, 614-615, 614f-615f, 615t
- Patency of IV needle, 973
- Patent airway maintenance
 in immobile patients, 1217
- Pathogenicity, 622
- Pathogens
 chain of infection, 619-626, 619f, 620t-621t
 definition and types of, 618-619, 620t
 safety measures to contain, 792
- Pathological fractures
 causing immobility, 1198
 with osteoporosis, 770
- Patient behaviour
 guidelines for charting, 207t
- Patient care
 philosophies of, 126-136, 128b
- Patient care attendants (PCAs), 129
- Patient care flow sheets, 208, 210, 211f-212f, 213, 213b, 218f
- Patient charts; *See* charting
- Patient education; *See* client education
- Patient identification bracelets, 668f, 682f, 1354
- Patient information
Personal Information Protection and Electronic Documents Act (PIPEDA), 203, 236, 237b
- Patient outcomes
 HINC definition of, 233, 234t
- Patient safety; *See* safety
- Patient status
 HINC definition of, 233, 234t
- Patient teaching; *See also* client education;
 teaching
 guidelines for charting, 207t
 infection control, 646, 647b
 regarding vital signs, 533, 533b, 586b
- Patient transport
 preventing falls during, 811t
- Patient-centred care
 caring as foundation of, 262-272
- Patient-controlled analgesia (PCA), 1040, 1040b-1041b
- Patients; *See also* clients
versus clients, 57
 hygiene assistance, 835-836, 836f, 841-873, 843b-850b, 852b-854b, 856b-860b, 862b, 863f
 lifting, 783-785, 786b, 786f, 786t
 within metaparadigm concepts, 56-58, 57f
- Patients' rights
 regarding medication administration, 679b, 681-684
- Peak concentration, 668-669, 668f
- Pediculosis capitis, 834t
- Pediculosis corporis, 834t
- Pediculosis pubis, 834t
- Peer groups, 311t, 312-313
- Peer navigators, 364, 364b, 364f
- Peers
 and adolescent identity search, 355, 356f
 adolescent relationship with, 346t-347t, 348-349
 groups during growth and development, 311t, 312-313
 school-age, 346t-347t, 348-349
- Pelvic floor muscle exercises (PFMEs), 1154-1156, 1155b
- Pelvic floor trauma, 1168
- Penis
 physical examination of, 600f-601f, 601
 straight or in-dwelling catheter insertion, 1139b-1146b, 1140f-1142f, 1144f-1145f
- Peplau, Hildegard, 59b, 61
- Perceived losses, 448, 448t
- Perceptions
 of caring in nurses, 267, 267t
 sensory, 243, 1302-1305, 1304b, 1310
- Perceptual biases, 243
- Perceptual effects
 of sensory deprivation, 1304b
- Percussion
 during cardiopulmonary assessment, 893, 893t
 procedures, 540
- Perfringens enteritis, 1079t
- Perfusion, 513-521, 880-881
- Perimenopause, 368, 369t, 372b
- Perineal care
 bathing procedure for, 843b-850b, 850
 catheter hygiene, 1139b-1146b, 1146
- Perineum, 1123
- Periodontal disease, 827, 837t, 1062
- Perioperative nursing, 1325-1326, 1335, 1335b
- Peripheral arteries
 brachial, radial, and ulnar, 585-586, 586f
 femoral, popliteal, dorsalis pedis and posterior tibial, 585-588, 587f-588f
 pulse measurements, 584-589, 586f-588f, 588t
- Peripheral nerves
 neuropathy, 831, 1267-1268, 1267f
 older adult, 624-627, 626b, 628t
 pain, 1022, 1022t
- Peripheral resistance, 521
- Peripheral vascular access device (PVAD), 959-971, 959b-970b, 959f, 970t, 983b-984b
- Peripheral veins, 588-589
- Peripherally generated pain, 1022, 1022t
- Peristalsis, 1054-1055, 1162, 1164-1165
- Peristaltic contractions, 1054, 1160, 1161f, 1167
- Peritoneal dialysis, 1115-1116, 1116b
- Peritonitis, 596, 596b
- PERRLA notation, 561-562
- Person
 within metaparadigm concepts, 56-58, 57f
- Personal appearance; *See* appearance
- Personal care home, 377-378
- Personal digital assistants (PDAs), 220, 222
- Personal Information Protection and Electronic Documents Act (PIPEDA)*, 203, 236, 237b
- Personal knowledge, 70, 70t
- Personal protective equipment, 641b-643b, 641t, 644-645, 645b, 649, 652b-657b, 659
- Personal questions/ opinions, 257-258
- Personal space, 247-248, 248b
- Personality
 aging theories, 376-377
 Sigmund Freud's psychoanalytic model of personality development, 315-317, 317t
- Perspiration
 and fever affecting urination, 1116
 as fluid, electrolyte, and acid-base imbalance risk factor, 947-949, 947b
 foot odour, 832t
 and skin hygiene, 826t
- Pesco-vegetarian diets, 1066
- Petechiae, 553
- PH levels
 and acid-base balance, 942-945, 946t
 definition of, 941-942, 941f
 gastrointestinal aspirate to test, 1101b-1102b
 laboratory values and possible etiologies, 1388t-1389t, 1396t-1398t
 needs of microorganisms, 620
 urinalysis to determine, 1128t, 1396t-1398t
- Phagocytosis, 624
- Pharmacists, 677
- Pharmacology; *See* medication administration; medications
- Pharynx
 physical assessment/examination of, 568-570, 568f-571f, 568t, 569b
 swallowing, 1054, 1054f, 1160, 1161f
- Phenomenology, 76
- Phenomenon
 defining in scientific theorizing, 54, 56t
- Philosophy of science, 55
- Phlebitis, 588-589, 985
- Phlebotomy scale, 970, 970b, 970t
- Phone advice
 legal issues with dispensing, 102
- Phosphate, 937t, 941
- Physical abuse
 child abuse, 47-48, 104-105, 423-424, 423b
 elder abuse, 385, 386b
 of infants, 336, 336b
 laws and reporting, 104-105
 nursing responsibilities and awareness of, 47-48, 423-424, 423b
 red flags during physical exam, 547b-548b, 548
- Physical activity; *See* exercise and physical activity
- Physical assessments and examinations;
See also health histories
 age group sensitivity, 543, 544b
 components of comprehensive, 538-539
 culturally competent, 538
 environment for, 541-543, 542f, 543b, 544t
 equipment and supplies, 542, 542f, 543b
 five skills of
 auscultation, 540-541
 inspection skills, 539, 540t
 olfaction, 541, 542t
 palpation, 540, 540t, 541f
 percussion, 540
 infection control, 541-542
 organization and body systems
 abdomen, 594-597, 595f, 595t, 596b, 597f
 abuse and substance abuse red flags, 547b-548b
 breasts, 589-594, 590b-591b, 591t, 592f-594f, 593b
 ears, 563-565, 564b, 564f-565f, 564t, 566t-567t
 eyes, 559-573, 559f, 560b, 560t, 561f-562f, 563b
 female reproductive tract and genitals, 597-599, 598t, 599f, 600b
 general appearance and behaviour assessment, 546-548
 head and neck, 557-559, 559f, 559t-560t
 heart, 578-582, 579f-581f, 579t, 582b
 (See also cardiovascular system)
 height and weight and body mass index (BMI), 548-550, 549f-550f, 549t
 integumentary system, 550-557 (See also hair; integumentary system; nails; skin)
 lymph nodes, 571-572, 571t, 572f, 589, 589f
 male genitalia, 600-602, 600b, 600f-601f, 601t, 602b
 mouth and pharynx, 568-570, 568f-571f, 568t, 569b
- Physical assessments and examinations
 (*Continued*)
 musculoskeletal system, 603-608 (See also musculoskeletal system)
 neck, 570-573, 571f, 571t
 neurological system, 608-615 (See also neurological system)
 nose and sinuses, 564b, 565-568, 567f, 567t
 recommended screenings, 545t-546t, 572b, 572f-573f
 rectum and anus, 603, 603t, 604b
 thorax and lungs (See lungs; thorax)
 vascular system (See vascular system)
 vital signs (See vital signs)
 positioning of patients, 543, 544t
 preoperative, 1336
 purposes of, 538-539
- Physical development/changes
 adolescent, 345-348, 352-354, 353t-354t
 with aging, 380-382, 381t, 388-391
 infant, 332
 middle adulthood, 368, 369t
 newborns, 328, 330-332, 331f
 preschooler, 341
 school-age children, 345-348
 toddler, 339-340
 young adulthood, 362
- Physical environments
 as determinant of health, 5, 8
 hazardous, 48, 791-792, 797-798, 797b
 as *Strategies for Population Health* health determinant, 5
- Physical examinations, 160-161
- Physical hazards, 791-792
- Physical illness
 affecting ability to learn, 294
 hampering sleep, 995-996, 999b, 1002, 1005
- Physical inactivity
 as behavioural risk factor, 3-4, 6f
 as determinant of health, 5, 8-9
- Physical manifestations
 associated with normal grief, 454b
- Physical restraints, 812-819, 812b-813b, 813f, 815b-819b
- Physician orders, 24
- Physicians' orders
 computerized physician order entry (CPOE), 223
 legal issues with, 98b, 102
- Physiological changes
 adolescent, 345-348, 352-354, 353t-354t
 with aging, 380-382, 381t, 388-391
 infant, 332
 middle adulthood, 368, 369t
 newborns, 328, 330-332, 331f
 preschooler, 341
 school-age children, 345-348
 toddler, 339-340
 young adulthood, 362
- Physiological factors
 health history assessment, 157b-158b
 influencing pain, 1023-1024, 1023b, 1024t-1025t
 risk, 3, 6f
- Phytochemicals, 763
- Piaget's Theory of Cognitive Development, 313, 314t, 315f
- Piaget's Theory of Moral Development, 314-315, 314t
- "PICO" questions, 66-70, 66b, 73t
- Pigeon-toes, 1197t
- "Piggyback", 677, 735-741, 736f, 742b-747b, 743f
- Pigmentation
 assessment of, 551-552, 551t-552t, 831b
 dark-skinned patients, 551, 831b
 as pressure ulcer warning sign, 1252, 1253b-1255b, 1253f
- Pill-crushing device and safety, 674f, 682b, 693b-697b, 695f
- Pitting edema, 553, 589f
- Pituitary gland, 475
- Pituitary-adrenal axis, 473, 474f
- Placebos, 1045-1046
- Placenta, 327
- Plains Cree people, 122b
- Planning
 client self-concept improvements, 408-411, 408b-409b, 408f
 communication skills needed during, 244b, 253
 in community health nursing, 51
 concept map, 187-188, 188f
 critical thinking during, 175-178, 175f-176f, 176t-177t
 definition of, 173-174

- Planning (Continued)**
 example of nursing care plan, 183b
 expected outcomes, 175-178, 175f-176f, 176t-177t
 of nursing care plan, 182-184, 183b
 priority setting, 133, 174-175, 174f
 stage of nursing process, 153-154, 154f, 173-178, 174f-176f, 176t-177t
 team consultations while, 184-185
Plantar flexion, 1203, 1204t-1208t, 1343b-1348b, 1347f
Plantar warts, 832t
Plasma laboratory tests, 1388t-1389t
Platelet aggregate inhibitors, 1064t, 1393t
Play
 in infancy, 333
 preschooler, 344
Pleadings, 96b
Pleural friction rub, 577, 578t
"PLISSIT" model, 429
Pneumonia
 postoperative, 1360, 1363-1365, 1364t-1365t
 risks in obese surgical patients, 1330-1332
Pneumothorax, 920, 1109t
Point of maximal impulse (PMI), 507b-511b, 509f-510f, 578
Point-of-care information systems, 220, 222
Poisoning
 accidental, 805b
 description and types of, 792, 797b
 during infancy, 333, 334b-335b
 prevention interventions for children and adolescents, 803t-804t, 805b
 toddlers prone to, 340-341, 342t-343t
Poisons
 definition and severity of, 792
Workplace Hazardous Materials Information System (WHMIS), 794, 795f
Policy
 nursing and health care, 11-12, 20, 51
Pollutants, 792
Pollution, 792, 820
Polymeric formulas, 1087-1100
Polyparmacy, 390-391, 688-690, 807b, 807f
Polyps
 nasal, 566-567
Polysomnograms, 996
Polyunsaturated fatty acids, 1052-1053
Polyuria, 1116, 1121t
Pons, 475
Pontine micturition centre, 1115
Popliteal artery
 for blood pressure measurement, 524b-528b, 525f
 and pulse, 507t, 586, 587f-588f
Population health
 and community group health nursing, 44-45
 vulnerable populations (See vulnerable populations)
Population health approach, 5, 12f
Population health promotion approach, 45
Population health promotion model, 5, 12-13, 12f
Population statistics
 Aboriginal groups, 109-110, 119-123
 in Canada, 109-110, 109f
 First Nations people, 119-120
 French-speaking population, 109-110
 affecting health care costs, 26
 Inuit people, 119-120
 Métis people, 119-120
 as *Strategies for Population Health Report* determinant, 5
Portability
 as principle of *Canadian Health Act of 1984*, 17-18, 18t
Portable work stations, 208
Portal of entry, 619f, 621t, 622, 622b, 639-640
Portal of exit, 619f, 620-621, 634-635
Possey Bed Enclosure, 814, 814f
Possey quick-release tie, 815b-819b, 818f
Position sense
 behavioural signs of deficits in, 1308, 1309t
 kinesthetic sense, 1301, 1304b, 1309t
Positioning
 bariatric patients, 1231b
 for cardiopulmonary patients, 913-920
 devices and techniques, 1221-1230, 1221f-1222f, 1223b-1229b
 interventions to reduce pressure ulcers, 1275-1276, 1275b, 1276t
Positioning (Continued)
 nurse safety during patient, 783-785, 786b, 786f, 786t
 for physical examinations, 543, 544t
 postural drainage, 902, 903t-904t
 of surgical patients, 1357
 techniques
 logroll, 1223b-1229b, 1229f
 prone position, 1222-1230, 1223b-1229b, 1227f
 side-lying position, 1223b-1229b, 1228f, 1230, 1235f
 Sims' position, 1223b-1229b, 1228f, 1230
 supine position, 1222, 1223b-1229b, 1226f
 supported Fowler's position, 1222, 1223b-1229b, 1225f
 thrombus prevention, 1218, 1220f
 turning procedures for surgical patients, 1343b-1348b, 1346f
Positive expiratory pressure (PEP), 1343b-1348b, 1345f
Postanaesthesia care unit (PACU), 1351, 1357-1359, 1358f
Postanesthesia Recovery Score for Ambulatory Patients (PARSAP), 1359
Postanesthesia Recovery Score (PARS), 1358-1359, 1358t
Posterior thorax, 574-577, 575f-576f
Posterior tibial artery and pulse, 507t, 586, 587f-588f
Post-European contact, 119-120
Postgraduate certification, 1376
Postmortem care, 467-469, 468b
Postoperative surgical phase
 nursing process, 1359-1369
 postanesthesia care unit (PACU), 1357-1359, 1358f
Postpartum depression, 368t, 403
Postpartum women, 424-425
Post-traumatic growth, 476
Post-traumatic stress disorder (PTSD), 477, 483f
Postural drainage, 902, 903t-904t
Postural hypotension, 523
Posture
 abnormalities causing immobility, 1196, 1197t
 assessment of, 604, 605f-606f, 605t, 606b, 777-778, 778f
 and body mechanics, 773-774
 alignment and balance, 773, 1196, 1204-1209
 gravity and friction, 772-774, 778, 778f, 1196
 muscles associated with, 772
 nonverbal communication with, 247
 physical exam observation of, 547
 and proprioception, 773
 pulse rates and respiration influenced by, 512t, 514b
 in toddlers, 775
Potassium
 imbalances, 937t, 942, 943t-944t, 951t-952t
 measurement and normal values, 1337t, 1388t-1389t, 1396t-1398t
 regulation, 940
 replacement drugs, 1064t
 supplements causing fluid, electrolyte, and acid-base imbalance, 949b
Potassium chloride
 dangers of intravenous, 971b
Pouching
 ostomies, 1187-1188, 1188f, 1189b-1192b, 1190f-1191f
Poverty
 and access to care, 22b, 26
 addressed in *Achieving Health for All*, 4, 5f
 Cathy Crowe's advocacy regarding, 11-12, 11b
 as determinant of health, 5, 7
 Epp Report on, 4, 5f
 nutrition and, 1051, 1077-1078, 1078b
 school-age children living in, 349
 as *Strategies for Population Health* health determinant, 5
 vulnerable populations, 45, 47-49, 48b
Practical nursing in Canada
 Canadian Nurses Association (CNA) on
 value of, 1372
 competencies, 1379-1380, 1381f, 1386
 credentialling, 1375, 1383
 demand for, 1372-1375
 ecological and sociological factors, 1374-1375
Practical nursing in Canada (Continued)
 education requirement evolution, 1372, 1373t
 ethics, 1378
 evolution of, 1372, 1373t
 future of, 1384-1386
 history of, 1371-1375, 1373t
 legislation, 1382
 professional organizations, 1384
 professional requirement evolution, 1372, 1373t
 registered practical nurse (RPN) title, 1372-1375
 regulatory bodies, 1382-1383
 scope of practice, 1379-1381, 1379t, 1380f, 1386
 standards of practice, 1378-1381
 statistics by specialty area, 1377t
 titles, 1372-1375, 1383
 trends and issues, 1375-1378
 continuing education, ladder, and
 postgraduate issues, 1376
 educational requirements and
 programs, 1375-1376
 entry-to-practice requirements, 1376
 statistics by specialty and by
 province, 1377, 1377t-1378t
 workplace and workforce issues, 1377
Practice-based theories, 59b, 60
Dr. Moyra Allen's McGill Model, 59b-60b, 60
Florence Nightingale, 55, 60
Praxis, 63
Prayer, 436, 440, 442t, 444b, 752, 753b, 753t-755t
"Precharting", 205t
Pre-European contact, 119-120
Pregnancy
 affecting chest wall movement and
 breathing, 883
 contraception, 421, 422t
 health promotion during, 328, 329b
 nutrition, 1062-1063
 physical activity tolerance, 779b
 physiologic and psychosocial changes
 during, 364, 367t
 prenatal care, 366, 367b
 sexuality, 424-425
 surgery during, 1332
 teenage, 275-276, 358, 365
 unplanned, 365
 young adult, 365-367, 367b, 368t
Prejudice, 110-111
Preload, 879
Prematurity, 330
Premoral stage, 314-315
Prenatal care, 366, 367b
Prenatal period, 327b
Preoperational period, 311t
Preoperational stage of cognitive development, 340
Preoperative teaching plan, 1338-1339, 1339b-1341b, 1339f, 1341-1350, 1342f
Prerequisites for health
 in *Ottawa Charter for Health Promotion*, 4, 5f
Presbycusis, 380, 1304b, 1305
Presbyopia, 560b, 1304b
Preschoolers
 acceptable respiratory rates in, 514t
 age period defining, 327b, 341
 cognitive changes, 341-344
 health risks/concerns, 344-345
 nutrition, 344-345, 1060-1061
 sleep, 345
 vision screening, 345
 heart rate ranges in, 511t
 immobilization effects on, 1202
 language development, 341-344
 moral development, 341-344
 physical changes, 341
 play, 344
 psychosocial changes, 344
 safety interventions, 803-805, 803t-804t, 805f
 sleep patterns, 345, 1000
 teaching methods for, 295, 295b
Prescriptions
 order types, 675-677, 675b
 sample medication, 677, 677f
Prescriptive theory, 56, 57t
Presence
 illustrating caring, 265t, 268
Pressure ulcers; See also skin integrity; wounds
 bony prominences, 1251, 1252f
Braden Scale, 1259-1261, 1260t-1261t, 1274
Pressure ulcers (Continued)
 classification and staging guidelines, 1261-1264, 1262t-1263t, 1263b
 common sites of, 1251, 1252f
 debridement, 1277-1280
 definitions and alternate names for, 1251, 1262t-1263t
 dressings, 1274b, 1280-1290, 1281b-1285b, 1284f, 1286t, 1290f
 as full-thickness wounds, 1264-1266
 heel and ischial tuberosity images of, 1258f
 home care recommendations, 1274b
 in immobile patients, 1201, 1201b, 1211, 1220
 pathogenesis of, 1251-1253, 1252f, 1253b
 positioning interventions to reduce, 1275-1276, 1275b, 1276t
 precautions and prevention of, 831b, 851b, 1253-1257, 1254b-1255b, 1260t-1261t
 prevention quick guide, 1275t
 psychosocial impact of, 1257, 1274b
 risk factors for, 1253-1257, 1254b-1255b, 1259-1261, 1260t-1261t
 age, 1251, 1251b, 1257, 1275t
 friction, 1256, 1256f, 1260t-1261t, 1275t
 impaired mobility, 1254, 1260t-1261t, 1275t
 impaired sensory perception, 1253, 1260t-1261t, 1275t
 infections, 1257, 1257b, 1275t
 level of consciousness deficits, 1253, 1275t
 moisture, 1256, 1260t-1261t, 1275t
 nutrition, 1256-1257, 1256t, 1260t-1261t, 1275t
 pain, 1257
 shear, 1253-1255, 1256f, 1260t-1261t, 1275t
 tissue perfusion, 1257
 support surfaces, 1276-1277, 1276b, 1276t
 terminology and RAO guidelines, 1251, 1257, 1300
 treatment of, 1277-1280, 1278b-1280b
Preterm labour, 328, 329b
Prevention
 addressed in *Achieving Health for All*, 4, 5f
 Epp Report on, 4, 5f
 level of care, 25
 levels of disease, 11
 as pillar of primary health care (PHC), 22b
 recommended screenings, 545t-546t, 1313-1316, 1315b
Prevention of Falls and Fall Injuries in the Older Adult, 796
 Preventive nursing actions, 190
 Primary appraisal, 473
Primary care (PC)
 description of, 25
 versus primary health care (PHC), 21-22
Primary health
 focus in family nursing, 276, 276b
Primary health care (PHC)
 barriers to, 21-22
 case study, 23b
 as foundation of Canada's health care system, 21-22, 21f
 four pillars of, 22b
 future of, 22-23
 goals of, 21-22, 21f
 for Inuit and First Nations people, 18-19
 nursing leadership and management roles in, 128b
 versus primary care (PC), 21-22
 programs for middle-aged adults, 371-372
 Primary intention, 1264, 1264t, 1265f, 1269t
Primary nurse identifier
 HINC definition of, 233, 234t
Primary nursing care
 focus of, 44
 model, 129
 spiritual care, 443-444, 443f
 trends in, 46
Primary prevention, 11
Priority setting
 in clinical care coordination, 133
 model for, 174-175, 174f
 in teaching plans, 299
 when communicating with patients, 253
Privacy
 ethical responsibility of nurses to respect, 82b

- Privacy (*Continued*)
and nursing informatics legislation, 235-237, 237b
Personal Information Protection and Electronic Documents Act (PIPEDA), 203, 236, 237b
toileting, 1117, 1120, 1136, 1159
Private law, 95
Privatization of services, 27
Probiotics, 753t-755t
Problem solving
critical thinking in, 145
in families, 284
priority setting, 133, 174-175, 174f
Problem-intervention-evaluation (PIE), 209, 209b
Problem-oriented medical records, 208-209
Professional organizations, 20-21, 35-37, 37f, 1384
Professional regulations, 95
Professional shared governance councils, 132-133
Progress notes, 209, 209b-210b, 210t
Progressive relaxation, 757, 758b
Prompted voiding, 1155, 1156b
Pronation, 1203, 1204t-1208t
Prone position, 1222-1230, 1223b-1229b, 1227f
Propositions
defining in scientific theorizing, 54, 56t
Proprioception
changes with aging, 381-382, 381t, 1306
Prostaglandins, 1018b
Prostate cancer, 545t-546t, 1388t-1389t
Prostate gland, 545t-546t, 600f, 1112, 1114f, 1388t-1389t
Prostate-specific antigen (PSA), 545t-546t, 1388t-1389t
Prostatic hypertrophy, 1117
Prostheses, 1351
Protective gear, 103; *See also* personal protective equipment
Protective processes, 323
Protective touch, 268-269
Proteins
dietary, 1052, 1056-1058, 1057f, 1058t
laboratory values and possible etiologies, 1388t-1389t, 1396t-1399t
role in wound healing, 1256-1257, 1256t
urinalysis to measure, 1128t, 1396t-1398t
in vegetarian diets, 1066-1067
Proteinuria, 1113
Protocols, 185
Proton pump inhibitors, 1169t
Protozoans, 618-619, 620t, 1167-1168
Provinces
health care responsibilities of, 19
history of practical nursing in selected, 1373t
licensed practical nurse workforce statistics, 1378t
nursing registration in, 37
rehabilitation care provisions, 19
Pruritus, 667t
Pseudosaddition, 1021, 1046b
Psoriasis, 830t
Psychiatric advance directives, 104
Psychiatric facilities, 24
Psychoanalytic and psychosocial theories
Bowlby's attachment and separation theory, 319, 319b
Dynamic Maturational Model of Attachment, 320, 320b
Erikson's Theory of Eight Stages of Life, 317-319, 319f, 321t
Havighurst's Developmental tasks, 320-321, 321t
Sigmund Freud's psychoanalytic model of personality development, 315-317, 317t
Psychological health
benefits of exercise for, 774, 784b
health history assessment of, 157b-158b
isolation precautions affecting, 640-644, 643b
pain influenced by, 1025
and physical activity tolerance, 779b
sleep deprivation affecting, 999, 999b
affecting urination, 1117
Psychomotor skills
during implementation process, 188f, 189
learning, 293b, 294, 302b
Psycho-neuro-immunology
connection with spirituality, 435
Psychosexual development stages, 316, 317t
Psychosocial considerations
with immobility, 1202, 1211-1212, 1212b, 1220-1221
risk factors, 4-5, 6f
with urinary elimination, 1120
when coping with grief and loss, 451
Psychosocial development
infants, 333
play, 333
separation, 333
newborns, 330-332, 331f
older adult, 384-387, 391-392
preschooler, 344
school-age children, 346t-347t, 348-349
toddlers, 340
young adulthood, 362-364
Psychosocial risk factors
description of Labonte's, 4-5, 6f
Psychosocial stress
as determinant of health, 5, 7
when coping with grief and loss, 451
Psychotherapy, 753t-755t
Psyllium, 1179, 1180t
Ptosis, 560-562
Puberty, 345, 352, 397, 416-417, 591b
Public administration
as principle of *Canadian Health Act of 1984*, 17-18, 18t
Public communication, 245
Public health
framework for, 46f
versus global and international health, 108t
laws, 104-105
nursing, 39, 44-45, 46f
nutrition/food programs, 1078b
Public Health Nurses' Act, 39
services, 24
Public Health Nurses' Act, 39
Public health nursing
education, 39
focus and principles of, 44-45, 46f
research on high risk groups, 146b
Public law, 95
Public policy
nursing role health care, 11-12, 20, 51
Puerperium, 366-367, 368t
Pulmonary diseases
diagnostic tests, 1337t
pulse rates influenced by, 512t
Pulmonary embolism, 1199, 1200f, 1211, 1360, 1363-1365, 1364t-1365t
Pulmonary function tests, 896b
Pulmonary system
changes and infections in older adults, 624-627, 626b, 628t
and higher surgical risks in older adults, 1331t-1332t
respiratory physiology, 880-882, 880f-881f
Pulse, 506-513
acceptable adult ranges, 490b-491b, 491f
apical pulse rate, 506-511, 507b-511b, 509f
bradycardia and tachycardia, 512
cardiac output, 506
dysrhythmia, 513
factors influencing, 512t
health promotion tips regarding, 533, 533b-534b
heart rate ranges, 511t
in older adults, 534b
pattern and rate tests, 894t
peripheral measurements of, 584-589, 586f-588f, 588t
physiology and regulation, 506-513
pulse deficit, 512-513
pulse oxygen saturation (SpO_2), 515b-520b, 517, 520f
radial artery pulse and rhythm, 506, 507b-511b, 507t, 508f, 585
rhythm, 513
sites for assessing, 506-511, 507b-511b, 507t
stethoscope to measure, 506-511, 507b-511b, 511f-512f
strength and equality, 513
stroke volume, 506
Pulse deficit, 512-513, 581-582
Pulse oximeter, 896b
Pulse oximetry, 515b-520b, 517, 520f, 896b
Pulse oxygen saturation (SpO_2), 515b-520b, 517, 520f
Pulse pressure, 521
Pulse rates
exercise benefits for, 512t, 513, 786-787
ranges, 511t
Punctuality
cultural beliefs regarding, 118b
Pupils, 561-562, 561f-562f, 1317-1318
Pursed-lip breathing, 933
Purulent exudate, 624, 1257b, 1262-1264, 1269, 1269t
Pustules, 553, 554b
Pyelonephritis, 1117
Pyrexia, 493-494, 493f, 505, 505b
Pyrogens, 493-494
Q
Qi, 762
Qigong, 753b, 753t-755t
Quad cough, 932
Quadruplegia, 1197-1198, 1216f
Qualitative research
esthetics, 70, 70t
ethnography, 75-76
grounded theory, 76-77, 76b
phenomenology, 76
Quality
best practice guidelines, 66-70, 67b, 73t, 78, 135
consumer demands for, 26
definition of, 135
documentation and reporting, 206-208, 207t
and equality challenges in Canadian health care, 26-27
improvements, 135, 199-200
International Society for Quality in Health Care (ISQua), 27
patient safety goals, 126-136
philosophies of patient care, 126-136, 128b
research to improve, 77, 77f
working environments, 27, 126, 128b
Quality assurance and improvement studies, 77, 77f
Quality improvement (QI)
definition of, 135
Quality indicators
Canadian Institute for Health Information (CIHI), 19
Quality of life
and "aging well", 377, 377f, 380-382
and lifestyle choices for older adults, 387b, 388-391
Quality Worklife-Quality Healthcare Collaborative (QWQHC), 135-136
Quantitative research, 74-75
data analysis, 75
descriptive survey designs, 75
experimental research, 73t, 74-75
exploratory descriptive designs, 75
quasi-experimental research design, 73t, 75
Quasi-experimental research design, 73t, 75
Questioning
beyond the surface, 243
Calgary Family Assessment Model (CFAM), 278-284, 279f
circular family, 283, 285t
regarding client learning needs, 297, 297t, 298b
of families, 277-284, 278b, 279f, 287
linear, 284-285
one's own spirituality, 440-441, 440b
open and closed-ended, 159, 159b
regarding physical activity and exercise, 780b
during physical examination, 543
"PICO" format, 67-69
relevant communication, 256
self-concept, 406t
spirituality, 438-441, 439b
Quickening, 328
R
Race
defining *versus* ethnicity, 110-111
questioning family regarding, 280-281
sensory deficit variables, 1303
stereotyping, 111, 122, 243
RACE mnemonic
for fire procedures, 807b
Racism, 111, 122, 243
Radial artery
pulse and rhythm, 506, 507b-511b, 507t, 508f, 585-586, 586f
Radiation
heat, 492
Radiation exposure, 820
Randomized controlled trials (RCTs), 67-68, 68f
Range of motion (ROM)
assessing joint, 604-607, 606t, 607f-608f, 778-779
Range of motion (ROM) (*Continued*)
descriptive movement terms and illustration, 770-771, 1203-1204, 1204f
exercises, 1204t-1208t, 1219-1220, 1220f, 1231-1246
thrombus prevention, 1218-1219
types and illustrations, 1203-1204, 1204f, 1204t-1208t
Rapid eye movement (REM), 993-994, 994b, 995f, 1000-1001
Rashes, 667t, 830t
Reactions
anaphylactic, 667, 988t
sensory, 1302-1305
Receiver, 245, 245f
Reception
sensory, 1302-1305
Receptive aphasia, 258, 259b
Reciprocity, 287, 441
Recommended dietary allowances (RDAs), 1056, 1057f, 1058t
Record-keeping; *See also* documentation and reporting
forms, 211f-212f, 213-220, 214f-218f, 220b, 221f
medication documentation, 683, 688, 689f
Records; *See also* documentation and reporting
auditing-monitoring, 206
error prevention, 206-208
handling and disposal of, 222-223
information contained in patient, 203-204
legal guidelines for, 204, 205t
purposes of, 204-206
Rectal cancer, 545t-546t
Rectal thermometers, 495-500, 495b-500b
Rectum
bowel elimination, 1160f, 1162, 1162f, 1167, 1167t
medication administration, 664t, 705, 707b, 707f
physical assessment/examination of, 603, 603t, 604b, 1167, 1167t
temperature measuring site, 495-500, 495b-500b
Recumbent position, 778
Red blood cells (RBCs)
blood transfusions, 985-987, 986b-987b, 986f, 986t, 988t
complete blood cell count (CBC), 1337t, 1388t-1389t, 1393t
count during respiration assessment, 515b-517b, 517
hematology tests, 1393t
hemoglobin-oxyhemoglobin system within, 941
and kidney function, 1113
measurement and normal values, 1337t, 1399t
serum, plasma and whole blood chemistry tests, 1388t-1389t
and viscosity, 521
Red Cross, 16b, 17, 34, 34f, 39
Refeeding syndrome, 1108
Referent, 245, 245f
Referrals
in community health nursing, 51
documenting, 204, 204f
Referred pain, 1021-1022, 1029t
Reflection process, 148
Reflective journal writing, 148-149
Reflex incontinence, 1118, 1136b
Reflexes
accidents due to older adult changes in, 793-794
micturition, 1134
newborn development of, 330, 331f
types and assessment of, 614-615, 614f-615f, 615t
Reflexivity, 244
Refugees, 116
Regional anaesthesia, 1042, 1356
Regional analgesics, 1042, 1356-1357
Regional health authorities
restructuring responsibilities of, 19-20
Registered Nurses' Association of Ontario (RNAO)
best practice guidelines, 67b
bowel incontinence, 1175
caring attitudes and behaviours, 265b
conceptual model for developing and sustaining leadership, 126, 127f, 135-136
continuous learning environment, 133
critical thinking and nursing knowledge, 144

- Registered Nurses' Association of Ontario (RNAO) (Continued)
evidence-informed practice, 66-70, 66b, 73t, 78
fall prevention, 144, 393, 393b
leadership and management, 130, 130b, 135
listings of, 67b
nurse management of, 130, 130b, 135
pain relief ethics, 1018
pressure ulcers, 1251, 1257, 1274, 1275t
Prevention of Falls and Fall Injuries in the Older Adult publication, 393b, 796
web site information, 144
conceptual model for developing and sustaining leadership, 126, 127f, 135-136
on family nursing, 273-274
- Registered nurses (RNs)
education programs, 1372
examinations for licensure, 95
regulations and legal issues for, 95
scope of practice *versus* LPNs, 1379-1381, 1379t, 1380f
workforce statistics and facts, 15-16, 16b, 1372
- Registered practical nurses (RPN)
registration laws, 1373-1374, 1373t, 1383
- Registered psychiatric nurses
workforce statistics and facts, 15-16, 16b
- Registration
educational requirements, 95
evolution of Canadian practical nursing, 1372, 1373t, 1383
laws for registered practical nurses, 1373-1374, 1373t, 1383
- Regulated Health Professions Act, 1382
- Regulations/ regulatory bodies
legal issues and legislation, 1382-1383
nurse practitioner (NP), 95
for practical nursing in Canada, 1382-1383
professional, 95, 1382-1383
registered nurse (RN), 95
- Rehabilitation care
description of, 25-26
provisions in provincial and territorial plans, 19
to restore mobility, 1199b, 1216-1246, 1240b
- Rehabilitation centres
as institutional sector setting, 24
- Reiki therapy, 753t-755t, 1037
- Reimbursements
provisions in provincial and territorial plans, 19
- Reinforcement, 302
- Reinforcement-extinction, 399
- Related factors, 167, 168f, 168t
- Relational communication, 243
- Relational ethics theory, 86, 90
- Relational inquiry approach, 277-278, 278b
- Relational practice, 123, 252, 277-278, 278b
- Relative humidity, 791
- Relaxation therapy, 484-485, 757-759, 758b, 1036-1037, 1036b
- Religieuses hospitalières, 33
- Religion
in Aboriginal culture, 121-122
atheists and agnostics, 436
beliefs
death and dying, 117t, 118, 452, 452b, 456t
health, 442t
pain, 1024
postmortem care, 467-469, 468b
Buddhism, 442t
Christianity, 434-435, 442t, 1065t
cultural assessment of, 117t, 118, 434b
definition of, 436
dietary restrictions based on, 1065t
and faith
self-concept influenced by, 398, 434-435, 439b
versus spirituality, 436-438
family questions regarding, 281
Hinduism, 442t, 753t-755t, 1065t
Islam, 442t, 1065t
Judaism, 442t, 1065t
listing of different, 442t
Mormons, 1065t
and origins of nursing, 30-34, 32b, 33f, 434
Seventh-day Adventists, 1065t
Sikhism, 441, 442t
versus spirituality, 436, 442t
- Reminiscence, 392
- Remodeling, 1266
- Remote monitoring, 26
- Remote nursing, 33-34
- Renal calculus, 1114, 1201
- Renal colic, 1114
- Renal disease
as fluid, electrolyte, and acid-base imbalance risk factor, 947-950, 947b-948b, 951t-952t
renal failure, 1115, 1116b
Renal failure, 1115, 1116b
- Renal nephron
anatomy and physiology, 1113, 1113f
- Renal pelvis, 1114, 1114f
- Renal replacement therapies, 1115-1116
- Renal scan, 1129t-1130t
- Renal system
anatomy and physiology, 1113-1119, 1113f-1114f
surgery in older adults, 1331t-1332t
- Renal ultrasonography, 1129t-1130t
- Renin, 1113-1114, 1114f
- Renin-angiotensin mechanism, 1113-1114, 1114f
- Reorganization phase, 449-450, 449t
- Reporting, 223-226; *See also*
documentation and reporting
of adverse events, 90-91, 98b
change-of-shift reports, 223-225, 224t
identification-situation-background-assessment-recommendation-repeat back (I-SBAR-R) technique, 223-226, 224b
incident reports, 225-226
situation-background-assessment-recommendation (SBAR) technique, 223-226, 224b
telephone orders (TOs) or reports, 225, 225b
transfer of accountability (TOA) guidelines, 223-224
transfer reports, 225
verbal orders (VOs), 225, 225b
- Reports
versus charts or records, 203-204
- Reproductive systems; *See* female reproductive tract and genitals; male reproductive tract and genitals
- Research; *See* nursing research
- Research process, 73, 73t
- Reservoirs
control/elimination for sepsis, 634, 634b
description of, 619-620, 619f, 620t, 634, 634b
- Residents
of assisted-living facilities, 377-378
in long-term care, 220, 220b
- Residual urine, 1117, 1135
- Resilience, 323, 324b
- Resiliency, 276
- Resistance stage
in general adaptation syndrome, 473, 474f
- Resistive exercises, 775, 783
- Resource management
in community health nursing, 51
- Respect
and concept of caring, 262-263
and dignity awareness during communication, 243, 250-252, 252b
in nursing code of ethics, 82b-83b, 83-84
of patient's religion and faith, 440-441
relational ethics theory, 86
- Respiration
acceptable adult ranges, 490b-491b, 491f
arterial oxygen saturation, 515b-520b, 517
assessment of, 514-517, 515b-517b, 516f
benefits of exercise for, 514b, 787
breathing pattern alterations, 514-517, 517t
changes in older adults, 534b
diffusion, 513-521
factors influencing, 514b
health promotion tips regarding, 533, 533b-534b
mechanics of breathing, 513-514, 514f
pattern and rate tests, 894t
perfusion, 513-521
postoperative assessment of, 1360, 1363-1365, 1364t-1365t
pulse oximetry, 515b-520b, 517, 520f
pulse oxygen saturation (SpO₂), 515b-520b, 517, 520f
respiratory rate, 513-514, 514f, 514t, 515b-517b
- Respiration (Continued)
respiratory tests and methods, 895t
ventilation, 513-521, 515b-517b
ventilatory depth and rhythm, 517, 517t
- Respiratory gas exchange, 881-882
- Respiratory infections
assessing history of, 891
- Respiratory rate, 513-514, 514f, 514t, 515b-517b
- Respiratory system
aging and, 380, 381t
as fluid, electrolyte, and acid-base imbalance risk factor, 947b-948b, 949, 951t-952t
hyperventilation, 887
hypoventilation, 887
hypoxia, 887
immobility affecting, 1199, 1210, 1210t, 1217
physiology, 880-882, 880f-881f
respiratory gas exchange, 881-882
structure and function, 880-881, 880f-881f
- Respiratory tract
defence mechanisms in, 623t
health care-associated infections, 624-626, 625b-626b
infections, 626b
- Respite care, 25-26, 287
- Responsibility
accountability, 82b-83b, 83
regarding adverse events, 90-91
communication of, 251
competency of nurse management, 131f, 132
professional nursing standards of care, 95-97, 148
reliability and dependability, 82-83, 82b-83b
and scope of practice, 133-135, 134b
- Rest
influencing growth and development, 311t, 312-313
post-surgery, 1351
and sleep, 999-1002
- Resting energy expenditure (REE), 1051-1059
- Restless leg syndrome, 996, 997b
- Restraints, 812-819, 812b-813b, 813f, 815b-819b
- Reticular activating system (RAS), 993, 994f
- Reticular formation, 475
- Retinal detachment, 1304b, 1312f
- Retinopathy, 560b
- Retirement, 377f, 384-385
- Retracted penis pouch external urinary device, 1154f
- Retrograde pyelogram, 1129t-1130t
- Retrograde urethrogram (RUG), 1129t-1130t
- Return demonstrations, 293b, 303t, 304
- Rhabdosphincter, 1115
- Rhinitis, 667t
- Rhonda, 577, 578t
- Rhythmic breathing, 757-759, 758b
- RICE treatment for injuries, 786b
- Right to refuse
"do not resuscitate" (DNR) orders, 102
medications, 683
- Rights
to health care, 20-21
ten medication administration, 679b, 681-684
- Right-to-die heart failure, 884
- Right-to-die legislation, 103-104
- Rinne test, 566t-567t
- Risk behaviours
in adolescents, 48-49, 397, 400, 400b, 402b
stigmatizing, 47, 49, 50b
- Risk factors
behavioural, 3-4, 6f
consideration during diagnostic process, 166-168
hygiene, 837t
physiological disease, 3, 6f
psychosocial, 4-5, 6f
socioenvironmental, 4-5, 6f
- Risk management
anticipating and preventing complications, 187-188, 188f
to prevent legal problems, 105
work by public health nurses, 146b
- Risks
individual safety, 794
patient safety, 794-796
workplace safety, 794, 795f
- Rituals; *See also* religion
spiritual questions, 436-441, 434t
Roach's caring theory, 265, 266
Rogers, Martha, 59b, 62
Role ambiguity, 403
Role centred informatics, 230t-251t
Role conflict, 403
Role confusion
versus identity, 318t, 398b, 399-400
Role models
identification with, 400
Role overload, 403
Role performance
assessment questions regarding, 406t
and self-concept, 399-400
stressors, 402-403
Role playing, 304
Role strain, 403
Roleplay, 293b
Roles
within families, 274-275, 275b, 284
performance influencing self-concept, 399-400
during pregnancy, 367, 368t
Romanow Commission, 20-21, 20b, 1384-1385
Romans
role in clean water and sanitation, 30
Rotation, 1204, 1204t-1208t
Rotavirus, 1167-1168
Routes of administration; *See* medication administration
Routine practices
and isolation guidelines, 640-644, 641b-643b, 641t
Roy, Sister Callista, 59b, 62
Royal Commission on Health Services (RCHS), 17, 37-38
Rural communities
adolescents in, 358-359
Russell, Edith Kathleen, 43b
- S
Saccharides, 1052
Safe practice
competencies, 135-136, 136b
Safe sex practices, 365, 420-421, 422t
Safety
adverse events, 90, 96, 98-99, 98b, 105, 169-170, 170b, 225-226, 794
competencies, 126-136, 136b
concerns
adolescents, 793, 803t-804t, 806, 806b
infants, 333, 334b-335b, 793, 803-805, 803t-804t, 805f
preschoolers, 344-345, 803-805, 803t-804t, 805f
school-age children, 350t-351t, 351
toddlers, 340-341, 342t-343t
critical thinking model, 796, 796f, 820f
cultural considerations, 802b
defining as basis need, 790-791
definition and competencies for, 126-136, 136b
environmental, 790-793, 797-798, 797b, 808-810, 820, 1318-1319
ethical responsibility of nurses to provide, 82b, 90-91, 187, 188f
falls (*See* falls)
fire prevention measures, 807-810, 807b, 808f
hand rails for toilets and showers, 810-820, 810f, 811t, 843b-850b, 848f
in health care settings, 794-796, 798, 843b-850b, 848f
Hendrich II Fall Risk Model, 798, 798t
home hazard assessment, 797-798, 797b, 799b, 799f
importance of client, 187, 188f
individual risk factors, 794, 798t
International Society for Quality in Health Care (ISQua), 27
legal issues with patient (*See* legal issues)
measures for sensory deprivations, 1321
medical errors, 90, 96, 98-99, 98b, 105, 169-170, 170b, 225-226, 794-795, 796b, 798-799
medication errors, 807b, 807f
nine life-saving solutions for patient, 796b
and nursing process
assessment, 796-799, 796f, 798t, 800b-801b
evaluation, 820-823, 820f
implementation and concept map, 801-820, 802b, 802f, 803t-804t
nursing diagnoses, 799, 799b-801b
planning, 799-801, 799f, 800b-801b

Safety (Continued)

- older adults, 791-794, 793b, 796-798, 798t, 1318-1319
- pathogens, 792, 808-810
- physical hazards, 791-792, 797-798, 797b
- physical restraints, 812-819, 812b, 813f, 815b-819b
- poisoning, 792, 797b
- pollution, 792
- Prevention of Falls and Fall Injuries in the Older Adult*, 796
- procedure-related accidents, 795, 796b, 798-799
- and quality patient care goals, 126-136, 136b
- radiation exposure, 820
- restraints, 812-819, 812b-813b, 813f, 815b-819b
- risks at developmental stages, 793-794
- seizure precautions, 794-795, 820, 821b-822b
- for sensory alteration patients, 1318-1319
- temperature needs, 791
- terrorism, 793
- Safety bars for toilets and showers, 810-820, 810f, 811t, 1322
- Salem sump tube, 1100-1107, 1104b, 1181-1184, 1185t
- Saline lock, 741, 741f, 742b-747b, 743f
- Salivary glands
 - digestive role of, 1054, 1054f, 1160-1162, 1161f, 1167, 1167t
- Salmonellosis, 1079t
- Same-day surgery, 1327, 1335b, 1351
- Postanesthesia Recovery Score for Ambulatory Patients (PARSAP), 1359, 1359t
- Same-sex couples, 274, 362
- Sandwich generation, 368-370
- Sanguineous exudate, 624, 1269, 1269t
- SASH method, 737b-741b
- Saskatchewan
 - Patient First Review*, 20-21
 - taking lead in health care insurance, 17
- Saturated fats, 1052-1053
- Saw palmetto, 764t-765t
- Scalp, 553-555, 556t, 557b, 834t, 861-863
- Schistosomiasis, 891
- School-age children
 - acceptable respiratory rates in, 514t
 - age period defining, 327b
 - cognitive changes in, 346t-347t, 348
 - coping patterns, 346t-347t, 348-349
 - developmental behaviours of, 346t-347t
 - diversional activities, 345, 346t-347t
 - fears, 328-329, 346t-347t, 348-349
 - health education, 349-351, 351t
 - injury prevention, 350t
 - language development in, 348
 - morals development, 346t-347t, 348-349
 - nutrition issues in, 346t-347t, 351-352, 351b, 351t, 1061
 - oral hygiene, 351t
 - physical changes in, 345-348, 775
 - psychosocial changes in, 346t-347t, 348-349
 - puberty, 345
 - relationship with parents, siblings and peers, 346t-347t, 348-349
 - safety, 350t-351t, 351
 - self-concept, 328-329, 346t-347t, 348-349
 - sexuality and sexual identity in, 349-351, 351t
 - substance abuse, 351, 351t
 - teaching methods for, 295, 295b
- School-aged children
 - exercise recommendations for, 784b
 - heart rate ranges in, 511t
 - respiratory tract infections in, 887-888
 - safety interventions for, 803t-804t, 805-806, 805f
- Schools
 - exercise promotion in, 776
 - nursing, 34-40, 35b
- Scientific literature databases, 67-68, 68b
- Scientific method, 73-74, 73t, 144-145
- Scientific rationale for interventions, 179b, 183b, 187
- Scientific revolutions, 58
- Scientific theorizing, 54, 56t
- Sclerae, 561
- Scoliosis, 604, 606f, 1197t
- Scope of practice
 - and delegation, 133-135, 134b
 - of practical nursing in Canada, 1379-1381, 1379t, 1380f, 1386

Screening

- in community health nursing, 51
- hearing, 1307, 1308f, 1309t, 1315, 1315b
- nutritional, 1068, 1068f
- vision, 1307, 1308f, 1309t, 1313-1316, 1315b
- Screening tests
 - for newborns, 332
 - pre-surgery diagnostic, 1337t
 - in young adulthood, 365-366, 366f
- Screenings
 - colon cancer, 545t-546t, 1169, 1171b
 - recommended for physical assessments, 545t-546t, 572b, 572f-573f
- Scrotum, 600f-601f, 601-602
- Scrub nurses, 1326, 1355
- Secondary appraisal, 473
- Secondary care, 22-23
 - description of, 25
- Secondary intention, 1264, 1264t, 1265f, 1269t
- Secondary prevention, 11
- Second-hand smoke, 889-891
- Sedentary lifestyle
 - in adolescents, 357
 - as behavioural risk factor, 3-4, 6f
 - as determinant of health, 5, 8-9
 - and diabetes in Aboriginal peoples, 120-121
 - and growth and development, 311t, 312-313
- Seeking contextual knowledge, 244
- Seizure precautions, 794-795, 820, 821b-822b
- Self-absorption
 - versus generativity, 318t, 321t, 398b
- Self-care
 - assistance with hygiene-associated, 835-836, 836f, 841-873, 843b-850b, 852b-854b, 856b-860b, 862b, 863f
 - development in school-age children, 347, 347t
 - and empowerment, 3-4, 5f
 - Epp Report* on, 4, 5f
 - goals of, 26
 - influenced by poor self-concept, 397
 - personal hygiene, 825-829, 826t
 - as pillar of primary health care (PHC), 22b
 - in public and home health nursing, 45, 46f
 - sensory function affecting, 1302-1305, 1308, 1311, 1322
 - and spiritual care, 440-441
 - teaching client, 189, 191
- Self-care theory
 - Dorothea Orem's, 59b, 60-61
- Self-concept, 396-414
 - in acute and restorative care, 411-412, 412b
 - in adolescents, 328-329, 346t-347t, 348-349, 355-356, 397, 397f, 402, 402b
 - affected by illness and health, 397
 - behaviours suggestive of altered, 406b
 - bullying affecting, 403, 404b
 - changes during middle adulthood, 368
 - components of
 - body image, 399, 399f, 402
 - ethnic and cultural identity, 398, 399b
 - identity, 398
 - religion and faith, 398
 - role performance, 399-400
 - self-esteem, 400
 - sexuality, 398
 - critical thinking model, 402, 406f
 - definition of, 396-403
 - development of, 397-403, 398b
 - Erikson's developmental tasks, 397-403, 398b
 - family's effect on, 403-405
 - with immobility, 1202, 1211-1212, 1212b, 1220-1221
 - lifespan evolution of, 397
 - nurse facilitation of, 396, 403-412, 406f, 408f, 410f, 412f
 - and nursing process
 - assessment, 405-407, 406f, 406t, 407b
 - evaluation, 412, 412f
 - implementation, 411-412
 - nursing diagnoses, 407-408, 407b
 - planning, 408-411, 408b-409b, 408f
 - of older adults, 397, 403, 404b, 405f
 - and play in infants, 333
 - postoperative assessment of, 1368
 - religion, spirituality and faith
 - influencing, 398, 434-435, 439b
 - school-age children, 328-329, 346t-347t, 348-349

Self-concept (Continued)

- stressors, 400-403, 401f
- body image stressors, 401f, 402
- identity stressors, 401f, 402
- role performance stressors, 402-403
- self-esteem stressors, 403
- and urinary elimination, 1120
- Self-disclosure communication technique, 256-257
- Self-efficacy, 296
- Self-esteem
 - in adolescents, 328-329, 346t-347t, 348-349, 355-356, 400, 400b
 - assessment questions regarding, 406t
 - behaviours suggestive of altered, 406b
 - and caring in end-of-life care, 264, 463, 465
 - defining *versus* self-concept, 398
 - definition of, 403
 - and independence in older adults, 317-319, 319f
 - influencing self-concept, 400
 - in older adults, 397, 403, 404b, 405f
 - stressors, 403
- Self-evaluation
 - of cultural awareness, 114-116, 114b-115b
 - of family values and beliefs, 277
 - of values and ethics, 81-82, 81b
- Self-monitoring of blood glucose (SMBG), 1081-1082, 1082b-1087b, 1083f
- Selye, Hans, 473, 474f, 476
- Semi-Fowler bed position, 867t
- Sender, 245, 245f
- Senile keratosis, 553
- Sense of self
 - sensory function affecting, 1302-1305
- Senses
 - sensory deficits
 - causes of, 1304b
 - descriptions of, 1304b
 - sensory deprivation
 - cognitive, affective and perceptual effects of, 1304b
 - three types of, 1303-1305
 - sensory overload, 1305
 - visual (sight), 1301
- Sensible water loss, 939
- Sensorimotor period, 311t, 315f, 332
- Sensorineural hearing loss, 1304b
- Sensory aids, 835, 835b
- Sensory alterations
 - cognitive effects of, 1304b, 1308
 - hazards, 1309-1310, 1311b
 - mental status affected by, 1304b, 1308
 - nursing process application to
 - assessment and critical thinking, 1307-1311, 1307f, 1309t, 1310b-1311b
 - evaluation, 1322-1323, 1322f
 - implementation, 1312-1322, 1313b-1319b, 1321b
 - nursing diagnosis, 1311, 1311b
 - planning, 1311-1312, 1312f-1313f, 1313b-1315b
- Sensory deficits
 - in acute care setting, 392
 - assessment of, 1308, 1309t
 - assistive devices, 1310, 1310b
 - balance deficits, 1303-1305, 1304b, 1309t
 - behavioural signs of, 1308, 1309t
 - causes of, 1303-1305, 1304b
 - hearing deficits, 1303-1305, 1304b, 1309t
 - affecting learning, 305
 - patient admitting to, 1308, 1310, 1310b, 1317
 - taste deficits, 1303-1305, 1304b, 1309t
 - vision deficits, 1303-1305, 1304b, 1309t
- Sensory deprivation
 - cognitive, affective and perceptual effects of, 1304b
 - three types of, 1303-1305
- Sensory impairments
 - and life satisfaction research study, 1316b
- Sensory nerve receptors, 1302-1305
- Sensory overload, 1305
- Sensory pacing relaxation technique, 758b
- Sensory perception, 1302-1305
 - as risk factor for pressure ulcers, 1253, 1260t-1261t, 1275t
- Sensory stimuli
 - components of, 1302-1305
 - controlling in acute care environment, 1320-1321
 - environmental, 1306
 - promoting meaningful, 1317-1318
 - quantity and quality of, 1306
 - sensory deficits, 1303, 1304b

Sensory stimuli (Continued)

- sensory deprivation, 1303, 1304b
- sensory overload, 1305
- Sensory systems
 - accident risks increasing with aging, 793b
 - assessing in older adults, 378
 - changes with aging, 381-382, 381t
 - newborn development of, 330
- Separation
 - versus* dependency and attachment, 315, 319
 - and divorce, 370
 - during infancy, 333
- Sepsis
 - blood transfusion reaction, 988t
 - catheter, 1108, 1109t
- Sequential compression devices (SCDs), 1217-1219, 1218b, 1356-1357
- Serology-immunology tests, 1395t-1396t
- Serosanguineous exudate, 624, 1269, 1269t
- Serotonin
 - and pain, 1018b
- Serous exudate, 624, 1269, 1269t
- Serum creatinine, 1337t
- Serum electrolytes
 - measurement and normal values, 1337t, 1388t-1389t
 - tests during cardiopulmonary blood studies, 895t
- Serum half-life, 668-669, 668f
- Serum laboratory tests, 1388t-1389t
- Setting priorities
 - in death and grief situations, 460-461
 - in medication administration, 686
 - in self-concept work, 408b-409b, 408f, 410
 - in sexuality issues, 429
- 7-Axis Model of ICNP, 233-235, 234f, 235t
- Seventh-day Adventists, 1065t
- Severe acute respiratory syndrome (SARS), 24, 103, 619, 620t
- Sexual abuse
 - of Aboriginal women, 121
 - of infants and children, 336, 336b, 423-424, 423b
 - nursing responsibilities and awareness of, 47-48, 423-424, 423b, 426-427
 - red flags during physical exam, 547b-548b, 548
- Sexual behaviours
 - common male and female, 419
 - risky, 48-49, 357-358, 397, 400, 400b, 402b, 419-421
- Sexual desire, 417-419, 418b, 424t
- Sexual dysfunction
 - causes and types of, 424, 424t
 - in men, 424, 424t
 - in women, 424, 424t
- Sexual experimentation
 - during adolescence, 48-49, 357-358, 397, 400, 400b, 402b, 417
- Sexual health
 - alterations in, 423-424
 - dysfunction, 424, 424t
 - nursing health promotion regarding, 422-423, 426-431, 429b-430b
- Sexual identity
 - adolescent, 352-355, 353t-354t, 357-359
 - defining, 416-421, 417f
 - in school-age children, 349-351, 351t
 - stress, 402
- Sexual maturity, 352-355, 353t-354t, 357-358, 601
- Sexual orientation, 274, 275b, 280, 349, 351t, 352-355, 353t-354t, 357-359, 416
- Sexual response cycle, 418-419
- Sexuality, 415-432
 - and abortion, 421
 - adolescent, 352-355, 353t-354t, 357-359, 416-417
 - bisexuality, 416
 - in clients recovering from surgery, 425
 - community resources for information, 429b-430b, 430
 - contraception, 421, 422t
 - critical thinking model, 425, 425f, 427f
 - defining, 415-416
 - development of, 416-419, 417f-418f, 418b
 - disabled persons, 425
 - gender identity, 416-421, 417f, 418b
 - heterosexuality, 416
 - high-risk behaviours, 48-49, 397, 400, 400b, 402b, 419
 - HIV/AIDS (*See* human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS))

- Sexuality (Continued)**
 homosexuality, 416
 maturation during adolescence, 352–355, 353t–354t, 357–358
 middle adult, 369–370, 417
 nursing process application to, 426–431
 assessment, 425f, 426
 evaluation, 431, 431f
 implementation, 430–431
 nursing diagnosis, 426–427, 427b
 planning, 427–430, 427f, 428b
 in older adults, 385–386, 417–418, 418f
 pain affecting, 424, 424t, 1032
 in pregnant or postpartum women, 367, 368t, 424–425
 puberty, 345, 352, 397, 416–417, 591b
 school-age children, 349–351, 351t, 416–417, 417f
 and self-concept, 398
 sexual behaviours, 419
 sexual desire, 417–419, 418b, 424t
 sexual identity, 416–421, 417f
 sexual orientation, 416
 sexual response cycle, 418–419
 sexually transmitted infections (STIs)
 (See sexually transmitted infections/diseases (STIs/STDs))
 Sigmund Freud's psychoanalytic model of personality development, 315–317, 317t
 sociocultural dimensions of, 422–425
 transexuality, 416
 and urinary elimination, 1120, 1121t, 1122f
 young adulthood, 363–364, 363b, 416–417
- Sexually transmitted infections/diseases (STIs/STDs)**
 in adolescents, 357–358, 358t
 community health nursing efforts to prevent, 49
 female examination procedures to detect, 598–599, 598t, 600b
 male examination procedures to detect, 600–602, 600b, 601t
 types and prevention of, 419–421
 in young adults, 365
- Shame**
versus autonomy, 318t, 398b
 "Sharps" procedures, 734–735, 735b, 735f
 Shaving, 863, 863f
 Shear, 1253–1255, 1256f, 1260t–1261t, 1275t
 Shift work sleep disorder (SWSD), 997b, 999
 Shigellosis, 1079t
 Shivering, 491, 493f, 505
 Short bones, 770
 Short staffing, 101–102
Shoulder
 joint movement, 1204t–1208t, 1240
SI units
 Système Internationale d'Unités (See Appendix B)
- Siblings**
 adolescents, 346t–347t, 348–349
 rank order, 280
 school-age child's relationship with, 346t–347t, 348–349
 visiting newborns, 330–332, 331f
 Sick roles, 403
 Side rails, 815b–819b, 819, 819f
 Side-lying position, 1223b–1229b, 1228f, 1230, 1235f
 Sight; *See* vision
 Sigmoidoscopy, 1172b
 Sigmund Freud's psychoanalytic model of personality development, 315–317, 317t
 Sign language, 258, 259b
 Sikhism, 441, 442t
 Silence
 communicating with, 255, 256b, 269
 Silver dressings, 1288
 Simple carbohydrates, 1052
 Simple touch therapy, 753t–755t, 755b
 Sims' position, 1223b–1229b, 1228f, 1230
 Simulation, 295
 Simultaneity theories, 59, 62
 Jean Watson's model, 62
 Martha Roger's model, 59b, 62
 Rosemarie Parse's theory, 59b, 62
 Single orders, 669f, 677
 Singlehood, 274–275, 275b, 279–281, 279f, 363, 370
 Single-parent families, 274–275, 275b, 364, 366, 370
 Sinoatrial (SA) node, 879–880, 879f
 Sinus bradycardia, 885t–886t
 Sinus tachycardia, 885t–886t
- Sinuses**
 nasal medication instillation, 697, 699b–700b, 699f
 physical assessment/examination of, 564b, 565–568, 567f, 567t
 Sitting, 778, 1208–1209, 1209f
 Situational crises, 473–474, 477
 Situational losses, 448, 448t
 Situational low self-esteem, 408–410, 410f
 Situation-background-assessment-recommendation (SBAR) technique, 223–226, 224b
 Skeletal muscles, 771–772, 772f
 Skeletal system
 and physiology of movement, 770–773
Skin; *See also* skin integrity; wounds
 assessment of, 550–553, 550b, 551t, 829–831, 893t, 1122
 bathing
 Alzheimer's or dementia patients, 842b
 commercial cleansing packs ("bag bath"), 850, 850f
 complete bed bath, 841–854, 843b–850b
 partial bed bath, 841–854, 843b–850b
 perineal care, 843b–850b, 850
 unexpected outcomes and interventions, 843b–850b
 and body temperature, 492
 as body's largest organ, 1250
 breakdown (See also pressure ulcers; skin integrity)
 dark pigmentation as warning sign, 1252, 1253b, 1253f
 in immobile patients, 1201, 1201b, 1220
 postoperative, 1361–1362, 1364t–1365t
 with urinary incontinence, 1118b, 1122
 changes
 developmental and hygiene, 833–835
 with immobility, 1201, 1201b, 1210t, 1211, 1220
 and infections in older adults, 624–627, 626b, 628t, 830t, 833–835
 collagen, 1251–1253, 1251b, 1256
 colour
 impacting clinical assessments, 1259b
 and pigmentation assessment, 551–552, 551t–552t
 common problems with, 830t
 cultures, 1270, 1271b
 dehiscence, 1271, 1272f
 edema, 553, 589f
 hygiene and health risks, 826t, 829–831, 831b, 837t, 841–854
 as infection defence mechanism, 623t
 intradermal (ID) medications, 664t, 670, 670t, 734
 layers and structure of, 1251–1253, 1251f
 lesions, 553, 554b
 moisture, 550b, 552
 older adult issues with, 624–627, 626b, 628t, 830t, 833–835, 1251b
 palpation of, 540, 540t
 pigmentation, 551–552, 551t–552t, 831b, 1252, 1253b, 1253f
 preoperative assessment of, 1336
 pressure ulcers (See pressure ulcers)
 risk factors for impairment, 831b
 sensory organs of, 826t
 striae, 594–595
 substance abuse signs on, 552, 552t
 temperature measuring site, 495–500, 495b–500b
 texture, turgor, and vascularity, 550b, 552–553, 553f, 893t
 tissue perfusion, 587–588, 588t
 topical medication administration, 664t, 670t, 671, 692–705
 wound dressings, 1274b, 1280–1290, 1281b–1285b, 1284f, 1286t, 1290f
- Skin cancer**
 basal and squamous cell carcinoma, 553, 555b
 melanoma, 550, 550b, 553, 555b
 prevention and "ABCD" detection, 556b
 recommended screenings according to age, 545t–546t
- Skin integrity; *See also* pressure ulcers; wounds**
 and body fluids, 1256–1257, 1256t, 1272b
 Braden Scale, 1259–1261, 1260t–1261t, 1274
 classification of, 1261–1264, 1262t–1263t, 1263b
 malignant wounds, 1268, 1268f
- Skin integrity (Continued)**
 nursing process application to
 assessment, 1258–1271, 1259b, 1260t–1264t, 1263b, 1269t
 evaluation, 1298–1299, 1298f
 implementation, 1274–1298, 1275t, 1278b–1280b, 1282b–1285b, 1286t, 1291b–1293b, 1295b–1298b
 nursing diagnoses, 1271–1272, 1280b
 planning, 1272–1274, 1273f, 1274b
 postoperative assessment of, 1361–1362, 1364t–1365t
 tissue necrosis, 1261–1264, 1261f, 1262t–1263t
 wound contamination and, 1271–1272, 1272b
 Skin tears, 1266, 1266f
 Sleep, 992–1016
 adolescent, 1000
 alcohol and substance abuse affecting, 996–998, 997b, 1001, 1001b
 behavioural characteristics of, 993b, 1003–1005, 1004b
 biological clocks, 993
 blood pressure influenced by, 522
 circadian rhythms, 493, 493f, 993, 997b
 cycles, 994–995, 995f
 definition and importance of, 992–999, 993b
 depression and anxiety affecting, 995, 1005, 1007b–1009b, 1009f
 disorders
 excessive daytime sleepiness (EDS), 997, 997b, 1000
 hypersomnolence, 996, 997b
 insomnia, 996–997, 997b
 narcolepsy, 997b, 998, 1004b
 parasomnias, 996, 997b, 998–999
 shift work sleep disorder (SWSD), 997b, 999
 sleep apnea, 996b–997b, 997–998
 sleep deprivation, 997b, 999, 999b, 1005
 dreams, 995
 factors that disrupt, 996b–997b, 999b, 1001–1002, 1001b
 functions of, 992–993, 995
 and growth and development, 311t, 312–313, 1000–1001
 hygiene, 997, 998b, 1002, 1005, 1010b
 immobility affecting, 1202, 1211–1212, 1212b, 1220–1221
 infants, 338–339, 339t, 1000
 neonates, 338–339, 339t, 1000
 nocturia, 996, 1118
 nursing process application to
 assessment, 1003–1005, 1003f, 1004b
 care planning, 1006–1010, 1007b–1009b, 1007f, 1009f
 evaluation of, 1014–1015, 1014f
 implementation of healthy, 1010–1014, 1011b, 1013f
 nursing diagnosis, 1005–1006, 1006b
 in restorative or continuing care environment, 1013–1014
 obesity affecting, 996b–997b
 older adults, 1001, 1010b
 physical and mental illness hampering, 995–996, 999b, 1002, 1005
 physiology of, 993–995
 polysomnograms to test, 996
 preschooler, 345, 1000
 regulation and brain activity, 993, 994f
 and rest, 999–1002
 sleep architecture changes, 1001
 snoring, 996b–997b, 997–998
 stages of, 993–994
 nonrapid eye movement (NREM), 993–994, 994b, 995f, 1000–1001
 rapid eye movement (REM), 993–994, 994b, 995f, 1000–1001
 toddler, 339t, 1000
 young adults, 1000
 Sleep apnea, 996b–997b, 997–998, 1004b
 Sleep architecture, 1001
 Sleep deprivation, 997b, 999, 999b, 1005
 Slough, 1261–1262, 1262t–1263t
 Small intestine, 1160f, 1161–1162
 Small-group communication, 245
 Smallpox, 30–31
 Smell
 adjusting to loss of, 1317–1319
 assessment of, 1308, 1309t
 behavioural signs of deficits in, 1308, 1309t
 changes with aging, 381–382, 381t, 835, 1305–1306
 sense of, 1301, 1317–1318
 Smoke detectors, 807–810, 807b, 808f
- Smoking**
 assessment procedures, 575t, 579b, 579t, 890
 as behavioural risk factor, 3–4, 6f
 blood pressure affected by, 522
 Canadian ranking in, 19
 and cardiopulmonary function, 888b, 889
 as determinant of health, 9
 and heart health, 582b, 889–890
 infection defence damaged by, 627
 as leading cause of cardiopulmonary diseases, 889–891, 898b–899b
 legislation regarding, 18, 18t
 leukoplakia, 569, 569b
 older adult, 388
 and respiration, 514b, 520–521, 889
 second-hand smoke, 889–891
 as surgical risk factor, 1333
 teratogens, 329b
 young adult, 364–365
 Smoking cessation teaching, 296–297
 Snellen chart, 563
 Snively, Mary Agnes, 35–36, 35b
 SNOMED CT, 233
 Snoring, 996b–997b, 997–998
 SOAP or SOAPIE charting, 209, 209b
 Social determinants of health, 6, 11–12, 11b
 Social environments
 as determinant of health, 5, 10, 11b
 as *Strategies for Population Health Report* determinant, 5
 Social factors
 influencing practical nursing in Canada, 1374–1375
 and pain response, 1024
 Social hierarchy
 cultural belief variations regarding, 116–117, 117t
 Social injustices
 Aboriginal peoples, 47–49, 119–120, 123
 Social isolation
 due to hearing loss, 1306
 due to sexual problems, 427
 fears of dying patients, 465
versus intimacy, 318t, 321t
 of older adults, 385, 437b
 Social justice
 and emancipatory knowing, 70t, 71
 ethics of, 85
 and global citizenship, 108–109
 and inequities in global health care, 108
 principles of, 44–45
 Social learning theory, 296
 Social media, 240, 349
 Social organizations
 within Aboriginal populations, 120
 of different cultural groups, 116–117, 117t
 Social safety net
 description of Canadian, 16
 Social status
 as determinant of health, 5, 7
 as *Strategies for Population Health Report* determinant, 5
 Social support networks
 as determinant of health, 5, 7
 as *Strategies for Population Health Report* determinant, 5
 Social support system
 and exercise promotion, 777
 and grieving, 456t
 during young adult years, 364
 Socialization
 with sensory losses, 1321–1322, 1321b
 Sociocultural variables
 communication, 247–248, 251b, 252
 health history assessment of, 157b–158b
 pain, 1024–1026, 1026b
 sexuality beliefs, 422–425
 stress responses, 478, 479b
 Socioeconomic status
 of Aboriginal groups, 120
 and coping with grief and loss, 451
 questions during cultural assessment, 117t, 118
 vulnerable populations due to, 45, 47–49, 48b
 Socioenvironmental approach to health, 4–6, 6f
 Socioenvironmental risk factors, 4–5, 6f, 47–49, 1374–1375
 Sodium
 imbalances, 937t, 942, 943t–944t, 947b, 954b
 measurement and normal values, 1337t, 1388t–1389t
 regulation, 940
 Sodium-potassium pump, 938, 939f

- Soft palate, 570, 570f, 1160, 1161f
 Soft silicone dressings, 1286f, 1288
 SOLER acronym for active listening, 254
 Solutes, 937
 Solutions
 intravenous (IV) therapy, 971–972, 971t
 measurement, 672, 672t
 solvents, 937
 Solvents, 937
 Somatic pain, 1022, 1022t
 Sounds
 adventitious sounds, 576–577, 578t
 auscultation to hear body, 540–541
 bowel, 596, 596b, 1167, 1173b, 1173f
 bruit, 583–584, 584f
 heart rate, 507b–511b, 512–513, 512f, 534b, 541, 580–582
 nonverbal communication with, 247
 normal breath, 577t
 stethoscope, 506–513, 507b–511b, 511f
 transmissions and hearing, 563–564
 Source records, 209–210
 Sources of law, 95
 Special needs patients
 communication with, 258, 259b
 vulnerable population, 45, 47–49, 48b
 Specialization, 1374
 Specialty formulas, 1087–1100
 Speciation, 1374
 Specimens
 collection guidelines, 645, 646b
 wound, 645, 646b
 Speech
 assessment during physical exam, 547
 first sounds in infancy, 333
 impairments, 258, 259b, 1321
 Spermatogenesis, 354t
 Sphygmomanometer, 524–529, 524b–528b, 525f–526f, 528f, 529t, 531f
 Spinal cord injury, 1215, 1216f, 1231
 Spinothalamic pathway, 1018, 1019f
 Spiritual care
 competencies, 438–441, 441b
 definition and attributes of, 443–444, 443f
 ethical, 440–441
 nurse's role in facilitating, 443–445, 443b–444b, 443f
 nursing, 437b, 438–441, 438f
 Spiritual care providers, 438–441, 441b
 Spiritual caring, 264, 270
 Spiritual health, 433–446; *See also* spiritual care; spirituality
 applying nursing theory to, 435–436
 coping skills aided by, 433–438, 438f
 definition of, 434–436
 mind-body connection, 435
 Spiritual inquiry, 245
 Spiritual nursing care
 critical thinking, 438–441, 438f
 mapping process and qualities of, 437b
 Spirituality
 in Aboriginal culture, 121–122
 ancient Hebrew, 30
 assessing patient's, 434, 434b, 438–441, 438f, 439b, 443–444
 Canadian heritage of, 433–435, 438–441
 and caring, 264, 270
 coping skills aided by, 433–438, 438f
 cultural assessment of, 117t, 118
 death and dying beliefs, 117t, 118
 defining, 433, 436
 derivation of the word, 433, 436
 and different religious beliefs about health, 442t
 ethical spiritual care, 440–441, 440b
 and faith, 436–438
 family questions regarding, 281
 holism, 435–436, 751–752, 757b
 mind-body connection, 435, 435b
 nurse self-reflection regarding, 440–441, 440b, 443b
 nursing diagnoses related to, 435–436
 nursing theory and, 435–436, 438f
 in older adults, 434–438, 437b
 and pain, 1024
 and postmortem care, 467–469, 468b
 psycho-neuro-immunology connection, 435
 versus religion, 436
 review during health history assessment, 157b–158b
 and self-concept, 398, 434–435
 spiritual inquiry, 245
 spiritual practices, 444b
 understanding patient's, 434, 434b, 438–441, 438f, 439b, 443–444
 Spirometry, 881, 920, 920f, 1343b–1348b, 1345f
 Spoon nail, 558b
 Spring tension oximeter probe, 520f
 Sputum, 890–891, 891b, 896b
 Squamous cell carcinoma, 553, 555b
 St. Benedict of Nursia, 30
 St. Catharines Training School, 35
 St. John's wort, 764t–765t
 Stabbing wounds, 97
 Stability concept, 2–3
 Staff mix decision making, 132b
 Stairs, 811t
 Standardized care plans, 219
 Standards
 critical thinking, 155, 155f, 163f
 development of EHR, 232–233, 232b, 240
 International Health Terminology Standards Development Organization (IHTSDO), 234
 nursing informatics (NI), 231–235, 232b
 nursing language, 233
 Standards Collaborative, 232–233, 232b, 236b, 240
 Standards of care; *See also* best practice guidelines
 Standards of practice; *See also* Canadian Nurses Association (CNA); *Code of Ethics*
 for critical thinking, 148
 defining nursing unit, 128b, 135
 evaluation and improving, 199–200, 236b
 gerontological nursing, 378–387
 guidelines to prevent legal problems, 95–97
 International Health Terminology Standards Development Organization (IHTSDO), 234
 nurse-sensitive outcomes, 135, 236b
 practical nursing in Canada, 1378–1381
 Standing
 correct body alignment while, 778, 778f, 1209, 1209f
 Standing orders, 185–186
Staphylococcus infections, 620, 620t–621t, 1079t, 1351
 Starling's law, 879
 STAT orders, 669t, 677
 Statute law, 95
 Stenosis, 583, 584f
 Step-families, 274–275, 275b
 Stereognosis sense, 1301
 Stereotyping
 ageism, 376
 CNA's *Code of Ethics* on, 111
 definition of, 111
 older adult, 257, 375–376
 racial and ethnic, 111, 122, 243
 religion or faith, 440–441
 Sterile fields, 648f–650f, 650–652, 650b–651b
 Sterile scrub nurses, 1326, 1355
 Sterilization
 categories and prioritizing, 633b
 disinfection, 633–634, 633b, 634t
 sterile procedures, 641t, 649–659, 650b–659b, 650f
 of wounds, 1289–1294
 Steroids, 947–949, 947b, 949b
 Stethoscope
 blood pressure measurement, 524–529, 524b–528b, 526f
 for examinations, 541, 575–576, 576f, 584f, 644
 parts of, 507b–511b, 511f–512f, 512–513
 pulse measurement, 506–511, 507b–511b, 511f–512f
 ultrasonic, 530
 Stigmatizing risk behaviours, 47, 49
 Stimulants, 1001, 1001b
 Stochastic theories, 376
 Stoma
 bowel elimination, 1184–1188, 1185t, 1186f–1188f, 1189b–1192b
 care of, 913b–919b, 918f
 measuring, 1189b–1192b, 1190f
 psychological and body image issues with, 1186
 urinary, 1116, 1119, 1119f
 Stomach
 and bowel elimination, 1160–1161, 1160f–1161f, 1167, 1167t
 digestive role of, 1054–1055, 1054f, 1160–1162, 1161f, 1167, 1167t
 gastric contents, 1185f
 Stomatitis, 833
 Stools
 Bristol Stool Chart, 1166, 1166f
 characteristics of, 1166, 1166f, 1169, 1171t
 specimens, 645, 646b
 Strabismus, 559, 560b
Strategies for Population Health Report, 5, 13
Streptococcus infections, 620, 620t–621t
 Stress; *See also* stress management; stress response systems
 acute stress disorder, 477
 blood pressure and, 522
 body image, 401f, 402
 body temperature affected by, 493
 cardiopulmonary function and, 889
 conceptualizations of
 physiological, 473
 psychological, 473–474
 crises, 473–474, 476–477, 476b, 486
 defining *versus* stressors or responses, 472–473
 as determinant of health, 5, 7–9
 fight-or-flight response, 473, 473f
 general adaptation syndrome, 473, 474f
 identity, 401f, 402
 and immune system, 475–477, 475b, 627
 intervention models and strategies (*See* stress management)
 job, 366
 middle adulthood illness due to, 370, 371b
 nursing process application to
 assessment, 479–480, 480f, 480t, 484b
 evaluation and continuity of care, 484, 487
 implementation and health promotion, 482b–483b, 484–487
 nursing diagnosis, 480–481, 481b
 planning desirable outcomes, 481–484, 481f, 482b–484b
 nursing theories related to
 Neuman's systems model, 477–478
 Pender health promotion model, 477
 situational, maturational and sociocultural, 477–478
 post-traumatic stress disorder (PTSD), 477, 483f
 during pregnancy, 367, 368t
 relaxation therapy for, 757–759, 758b
 role performance, 402–403
 self-esteem, 403
 spirituality aiding coping with, 433–438, 438f
 stress response systems, 472–475, 475b
 toxic, 320b
 affecting urination, 1117
 Stress incontinence, 1116, 1118, 1137t
 Stress management
 benefits of exercise for, 484, 484b, 485f, 774b
 intervention models and strategies
 assertiveness training, 485
 crisis intervention, 486
 exercise, 484, 484b, 485f
 guided imagery, visualization and relaxation, 484–485
 journal writing, 485
 support systems, 484
 time management, 484
 in workplace, 485–486
 Stress response systems
 description of, 472–475, 475b
 factors influencing, 475b
 hypothalamic-pituitary-adrenal axis, 473–475, 474f
 relaxation therapy, 757–759, 758b
 sympathetic-adrenal-medullary system, 473–475
 Stressors
 characteristics influencing response, 475b
 internal and external, 472–473
 types of, 472–473, 475b, 476–477
 unique to older adults, 375, 475b, 477–478, 478b
 Stretchers
 transferring to and from, 1231, 1233b–1240b
 Stretching and flexibility exercises, 775, 783
 Striae, 594–595
 Stroke volume, 506, 879
 Strokes
 Canadian Heart and Stroke Foundation, 889–890
 and heart health, 582b
 heatstroke, 494, 505, 533, 533b–534b, 791
 Structural assessment
 in Calgary Family Assessment Model (CFAM), 279–281, 279f, 281f
 Student nurses; *See also* education
 career planning and mentorship, 136–137, 136f
 Student nurses (*Continued*)
 Donner-Wheeler Career Planning and Development Model, 136–137, 136f
 leadership and management skill development, 136–137, 136f
 legal issues for, 100–101
 medication errors, 680t
 trends and issues, 1375–1378
 clinical practice settings, 1376
 continuing education issues, 1376
 educational requirements and programs, 1375–1376
 entry-to-practice requirements, 1376
 Subcultures, 110–111
 Subcutaneous butterfly catheters, 747, 748b–749b, 748f
 Subcutaneous emphysema, 921b–924b
 Subcutaneous medications/injections, 664t, 670, 670t, 721–731, 722b–727b, 730f–731f
 Subjective data
 guidelines for charting, 207–208, 207t
 versus objective data, 156
 Subjective-objective-assessment-plan (SOAP), 209, 209b
 Subjects, 74–75
 Sublingual medications, 664t, 669, 669f, 670t, 693b–697b
 Substance abuse
 in Aboriginal peoples, 121
 adolescent, 356–357, 358t
 assessment during physical exam, 548
 as behavioural risk factor, 3–4, 6f
 CAGE substance abuse questionnaire, 548
 affecting cardiopulmonary function, 889
 as coping mechanism, 406–407
 red flags, 547b–548b
 in school-age children, 350t–351t, 351
 and self-esteem, 400, 400b
 signs on skin, 552, 552t
 sleep problems due to, 996–998, 997b, 1001, 1001b
 vulnerable populations, 45, 47–49, 48b
 young adult, 364–365
 Substance P, 1018b, 1019f
 Substitution, 399
 Sucrose
 for infant pain, 1028b, 1041
 Suctioning
 cardiopulmonary, 902–912, 905b–911b, 908f, 910f, 912f
 catheters, 902–912, 905b–911b, 908f, 912f
 nasogastric or orogastric, 1100–1107, 1104b–1106b
 nasopharyngeal, 905–912, 905b–911b
 nasotracheal, 905b–911b, 912
 oropharyngeal, 905–912, 905b–911b
 orotracheal, 905b–911b, 912
 tracheal, 905b–911b, 910f, 912
 Suctioning tracheostomy, 905b–911b, 910f, 912
 Sudden infant death syndrome (SIDS), 333
 Suffocation
 infant, 333, 334b–335b
 toddler and preschooler, 340–341, 342t–343t
 Sugar, 1052
 Suicide
 adolescent, 48, 356, 357b, 358t
 legal precautions and risks, 104
 risks in Aboriginal people, 48, 121
 in vulnerable populations, 48
 Summarizing communication technique, 256
 Sunrise Model, 114–116, 115f
 Superego, 316–317
 Superinfections, 623
 Supervision
 practical nursing, 1380
 Supination, 1203, 1204t–1208t
 Supine position, 1222, 1223b–1229b, 1226f
 Support surfaces, 1276–1277, 1276b, 1276t
 Support systems
 and coping with grief and loss, 451
 and grieving, 456t
 for grieving nurses, 469, 469f
 and stress management, 484
 Supported Fowler's position, 1222, 1223b–1229b, 1225f
 Supportive care level, 12, 26
 Supportive housing, 377–378, 378b–379b
 Suppositories, 664t, 705, 707b, 707t, 1166, 1179, 1180t
 Suprapubic catheterization, 1152
 Surface temperature, 491–494, 491b
 Surgery
 ambulatory, 1327, 1335b, 1359–1369, 1360b

- Surgery (Continued)**
- asepsis/infection control techniques, 626b, 641t, 646-659, 648b, 648f-650f, 652b-659b, 1350-1351
 - body image changes after, 1334
 - bowel elimination affected by, 1168, 1364t-1365t, 1367-1368
 - catheters (*See* catheters)
 - classification of, 1327, 1328t
 - cultural perceptions of, 1335, 1335b
 - intraoperative phase, 1355
 - medications, 1332-1333, 1333t
 - nutrition following, 1367
 - pain management, 1334, 1335b
 - physical patient preparation, 1350-1351
 - postanaesthesia care unit (PACU), 1357-1362, 1358f
 - postoperative assessment
 - abdominal gas, 1362, 1366-1367
 - circulation, 1360-1361, 1364t-1365t, 1365-1366
 - comfort, 1362, 1366
 - fluid and electrolyte balance, 1361, 1367
 - gastrointestinal function, 1362, 1364t-1365t
 - genitourinary function, 1362, 1364t-1365t, 1366-1367
 - neurological functions, 1361, 1367
 - pain, 1362, 1364t-1365t, 1366
 - respiration, 1360, 1363-1365, 1364t-1365t
 - self-concept, 1368
 - skin integrity and wound
 - characteristics, 1361-1362, 1364t-1365t
 - temperature control, 1360-1361, 1366-1367
 - urinary and bowel function, 1364t-1365t, 1367-1368
 - postoperative bedside equipment, 1355
 - postoperative surgical phase, 1357-1359, 1358f
 - preoperative holding area, 1355
 - preoperative medications, 1351, 1352b
 - preprocedure checklist, 1353f
 - risk factors
 - age, 1330, 1331t-1332t
 - allergies, 1333
 - fluid and electrolyte imbalances, 1332
 - immunocompetence, 1332
 - medications, 1332-1333, 1333t
 - nutrition, 1330
 - obesity, 1330-1332
 - pregnancy, 1332
 - smoking and alcohol use, 1333
 - same-day, 1327, 1335b, 1359-1369, 1360b
 - Surgical Safety Checklist, 1326, 1352-1354
 - urination affected by, 1116
- Surgical asepsis**, 646-659, 648b, 648f-650f, 652b-659b, 1350-1351
- Surgical nursing**, 1325-1370
- history of, 1326-1327
 - nursing process application to
 - assessment, 1329-1338, 1329f, 1330t-1333t, 1335b, 1337t
 - evaluation, 1357, 1368-1369
 - implementation, 1341-1354, 1363-1368
 - nursing diagnosis, 1337t, 1338, 1338b, 1362
 - planning, 1338-1339, 1339b-1341b, 1362-1363
 - postoperative exercises and instructions, 1343b-1348b, 1348, 1349f, 1355
 - preoperative teaching plan, 1338-1339, 1339b-1341b, 1339f, 1341-1350, 1342f
 - principles of, 1325-1326
 - Surgical Safety Checklist, 1326, 1352-1354
- Surgical patients**
- American Society of Anesthesiologists physical status (PS) classification, 1328t
 - convalescence shift from hospital to home, 1326
 - coping resources, 1334-1335
 - family support, 1334, 1341-1350, 1368, 1369b
 - older adults, 1363b
 - preparation before surgery, 1350-1354
 - Surgical Safety Checklist, 1326, 1352-1354
 - Surgical scrub procedures, 648b, 652, 652b-655b
 - Surgical wounds, 1257b, 1264, 1264t, 1268-1270, 1290-1294
- Surveillance**
- in community health nursing, 51
- Survivors**, 447-448, 451, 456t
- Susceptibility**, 619f, 621t, 622, 622b, 640-646, 640b
- Susceptible hosts**, 619f, 621t, 622, 622b, 627-628, 640-646, 640b
- Sustainability**
- defining Canadian health care system, 16-17
- Suture lines**, 331f
- Sutures**, 1291-1294, 1291f, 1293f
- Swabbing technique**, 1270, 1271b, 1271f
- Swallowing**
- aspiration precautions, 1072b-1073b
 - digestive process of, 1053-1056, 1054f, 1160-1162, 1161f
- Swanson's theory of caring**, 264, 266t, 269-270
- Sweat glands**, 833
- Sweating**
- in Aboriginal medicine, 753t-755t
 - body odour, 541, 542t
 - and fever affecting urination, 1116
 - as fluid, electrolyte, and acid-base imbalance risk factor, 947-949, 947b
 - and skin hygiene, 826t
- Sympathetic pain stimulation**, 1020, 1020t
- Sympathetic-adrenal-medullary (SAM) system**, 473-475
- Sympathy**
- versus* empathy, 257
- Symptoms**; *See also* pain
- associated with normal grief, 454b
 - control during dying process, 463-465
 - review in health histories, 157b-158b
- Synarthrotic joints**, 770-771, 771f
- Synchondrosal joints**, 770-771, 771f
- Syncope**, 1242, 1242f
- Syndesmodial joints**, 770-771, 771f
- Synergistic effects**, 668
- Synergistic muscles**, 772
- Synostotic joints**, 770-771, 771f
- Synovial joints**, 770-771, 771f
- Syphilis**, 365, 419-420
- Syringes**
- for medication administration, 673, 673b, 695f
 - procedures for using, 711-713, 712f, 714b-719b, 718f, 735b
 - "sharps" procedures, 734-735, 735f
 - types and parts of, 711f-712f
- Système Internationale d'Unités (SI units)**; *See* Appendix B
- Systemic circulation**, 879
- Systemic infections**, 622, 628, 632
- System's theories**, 61-62
- Betty Neuman's model, 61-62
 - Dorothy Johnson's model, 61
 - Sister Callista Roy's model, 59b, 62
 - University of British Columbia (UBC) model, 59b, 61
- Systole**, 579-581, 580f, 878-879
- Systolic blood pressure**, 490b-491b, 491f, 521-533, 522t, 524b-528b, 529t, 530b
- T**
- Tablets, 664t, 674f, 682, 682b
 - pill-crushing device and safety, 674f, 682b, 693b-697b, 695f
 - Tachycardia, 512, 884, 885t-886t
 - Tachypnea, 517t, 894t
 - Tactile fremitus, 575-576, 576f
 - Tactile sense, 1301, 1318-1319, 1322
 - Tai chi, 753t-755t, 756b, 784b, 787b
 - Tail of Spence, 592f
 - Tandem infusion setups, 741, 742b-747b, 743f
 - Task-oriented touch, 268-269
 - Taste
 - adjusting to loss of, 1317-1318
 - aging and, 381-382, 381t, 1306
 - assessment of, 1308, 1309t
 - behavioural signs of deficits in, 1308, 1309t
 - causes of alterations, 1303-1305, 1304b
 - and nutritional deficits, 1302
 - Taste buds
 - atrophy with aging, 380, 381t, 1306, 1317-1318
- Teaching (Continued)**
- plans, 299, 300b, 301
 - process *versus* nursing process, 297, 297t, 300b
 - assessment, 297-306, 297t, 298b, 300b, 302b
 - evaluation, 297t, 300b, 306
 - implementation, 297t, 301, 302b
 - nursing diagnosis, 297t, 298-299, 300b
 - planning, 297t, 299, 300b
 - during routine nursing care, 302, 302f
 - self-concept, 411-412, 412b
 - skills, 189, 191, 290-293
 - tools, 301b, 303t
- Teaching strategies**
- for adolescents, 295, 295b, 356-359, 358t
 - for older adults, 376, 376b
 - for preschoolers, 295, 295b
 - for toddlers, 295, 295b
- Team nursing**
- development of, 129
- Team-based care**
- as pillar of primary health care (PHC), 22b
- Teamwork**
- building skills
 - in community health nursing, 50
 - data collection, 158
 - interprofessional teams, 129-130
 - intraprofessional nursing teams, 129-130
 - leadership and management role in, 126-130, 126b, 128b
 - in pain management, 1047b
 - as pillar of primary health care (PHC), 22b
 - during planning process, 184-185
- Technology**
- as cost accelerator, 26
 - affecting nurse caring, 262-263
 - and nursing informatics, 228-241, 230t-231t
- Teenage pregnancy**, 275-276, 358, 365
- Tepees**, 755, 756f
- Teeth**
- anatomy and hygiene, 827f, 833, 835
 - health risks and problems, 837t
 - hygiene procedures and goals, 854-861, 855b-860b
 - mouth assessment, 568-570, 568t
- Teething**, 337, 835
- Teleology**, 84
- Telephone orders (TOs)**, 225, 225b
- Temperament**
- Chess and Thomas Theory of Temperament Development, 312-313
 - growth and development influenced by, 311t, 312-313
- Temperature**
- body (*See* body temperature)
 - environmental
 - human need for safe, 791
 - needs of microorganisms, 620
- Temporal artery**
- pulse site, 507t
 - temperature measuring site, 495-500, 495b-501b, 501f
- Tendons**
- determining body alignment and posture, 1196
 - and physiology of movement, 771, 771f-772f
- Teratogens**, 329b
- Terminal illnesses**; *See also* death and dying
- coping and spirituality, 433-438, 438f
 - palliative care
 - hospice, 25-26, 462-469
 - pain management, 1046
 - purpose and goals of, 462-469
- Terminology**
- effective communication with correct, 246-247
 - International Health Terminology Standards Development Organization (IHTSDO), 234
 - regarding older adults, 375
 - standards in nursing language, 233, 236b
- Territories**
- health care responsibilities of, 19
- Terrorism**, 793
- Tertiary care**, 22-23, 25
- Tertiary prevention**, 11
- Testicular cancer**
- recommended screenings according to age, 545t-546t
- Testicular self-examination**, 602b
- Testosterone**, 352, 416-419, 1388t-1389t
- Theoretical foundations**
- conceptual frameworks, 55-56, 56t-57t, 59
 - early nursing theory, 55, 60
 - future of, 62-63
 - interactionist theories
 - Everlyn Adam's helping process theory, 59b, 61
 - Hildegard Peplau's theory, 59b, 61
 - Joyce Travelbee's theory, 59b, 61
 - metaparadigm concepts, 56-58, 57f
 - needs theories, 59b, 60-61
 - Dorothea Orem's self-care theory, 59b, 60-61
 - Virginia Henderson's human needs theory, 59b, 60
 - nursing diagnosis, 55, 59
 - nursing process, 55-56
 - nursing science philosophy, 55, 58
 - practice-based theories, 59b, 60
 - Dr. Moyra Allen's McGill Model, 59b-60b, 60
 - Florence Nightingale, 55, 60
 - simultaneity theories, 62
 - Jean Watson's model, 62
 - Martha Roger's model, 59b, 62
 - Rosemarie Parse's theory, 59b, 62
 - system's theories, 61-62
 - Betty Neuman's model, 61-62
 - Dorothy Johnson's model, 61
 - Sister Callista Roy's model, 59b, 62
 - University of British Columbia (UBC) model, 59b, 61
 - types of theories, 56, 57t
- Theory**
- defining in scientific theorizing, 54, 56t
- Therapeutic communication**
- with grieving patients and family, 462
 - with older adults, 391
 - religious and cultural sensitivity, 434b
 - techniques, 243, 254-257, 283b, 284-287, 286b
- Therapeutic touch**
- benefits to older adults, 391, 391b
 - and caring, 263, 268-269
 - communicating comfort and caring with, 255, 255f, 256b, 391-392
 - description and applications of, 753b, 753t-755t, 755b, 761, 761f
 - pain relief, 1037-1038
 - and sensory changes with aging, 381-382, 381t
 - types of nursing, 268-269
- Thermometers**, 495-502, 495b-500b
- Thermoregulation**, 491-492, 494, 502, 504b, 533b-534b
- Thirst**, 938-940, 939t, 940f
- Thoracentesis**, 896b
- Thorax**
- examination of, 380, 381t, 574-577, 575f-576f
 - palpation of, 540, 540t, 576f
 - preoperative assessment of, 1336
- Thromb**, 582
- Thromboembolic device (TED) hose**, 1218, 1219b
- Thrombophlebitis**, 1360-1361, 1364t-1365t, 1365-1366
- Thrombus**
- compression stockings, 1217-1219, 1218b-1219b, 1356-1357, 1360-1361, 1365-1366
 - postoperative, 1360-1361, 1364t-1365t, 1365-1366
 - risks in immobile patients, 1199, 1200f, 1211
- Thumbs**, 1204t-1208t, 1241
- Thyroid gland**
- anatomy and palpation of, 540, 540t, 573, 573f
 - laboratory values and possible etiologies, 1395t-1396t
- Tibial artery and pulse**, 586-587, 587f-588f
- Ticks**, 834t
- Tidal volume**, 513-514
- Tie restraint strap**, 815b-819b, 817f
- Time**
- cultural beliefs regarding, 118b
- Time management**, 133, 174-175, 484
- Timing**
- of client teaching, 299, 305-306, 305t
 - during verbal communication, 247
- Tinea pedis**, 832t
- Tinnitus**, 1304b
- Tissue necrosis**, 1261-1264, 1261f, 1262t-1263t
- Tissue perfusion**, 520, 587-588, 1257
- Tobacco use**; *See* smoking

- Toddlers**
 acceptable respiratory rates in, 514t
 age period defining, 327b
 cognitive and language development, 340
 health risks/concerns, 340-341, 340f, 342t-343t
 nutrition, 341, 1060-1061
 sleep, 339t
 heart rate ranges, 511t
 immobilization effects on, 1202
 physical development, 339-340
 psychosocial changes, 340
 safety interventions, 803-805, 803t-804t, 805f
 skin and hygiene changes, 833
 sleep patterns, 339t, 1000
 teaching methods for, 295, 295b
 upper respiratory tract infections in, 887
- Toes, 1204t-1208t**
- Toileting**
 anxiety affecting urination/defecation, 1117, 1165-1166
 privacy, 1117, 1120, 1136, 1165-1166
 sensory function affecting, 1308, 1322
- Toilets**
 safety bars or raised seats, 810f, 1122, 1166, 1322
- Tongue, 570, 570f, 1054, 1160, 1161f**
- Tonic neck reflex, 330, 331f**
- Tooth eruption**
 in infancy, 337
 of permanent teeth, 348
- Topical analgesics and anaesthetics, 1041**
- Topical medications**
 for infected wounds, 1288-1289
 route of administration, 664t, 670t, 671
- Toronto Charter on Social Determinants of Health, 6**
- Toronto Disaster Relief Committee (TDRC), 11b**
- Torticollis, 1197t**
- Torts, 97**
- Total bilirubin test, 1170t**
- Total hip arthroplasty, 1342f**
- Total incontinence, 1118, 1136b**
- Total parenteral nutrition (TPN), 947-949, 947b, 958-971**
- Totality paradigm frameworks, 59**
- Touch; See also therapeutic touch**
 behavioural signs of deficits in, 1308, 1309t
 benefits to older adults, 391, 391b, 405f and caring, 263, 268-269
 communicating comfort and caring with, 255, 255f, 256b, 391-392
 physical assessment of, 1308, 1309t
 sense of, 1301, 1318-1319, 1322
 sensory changes with aging, 381-382, 381t
 therapeutic
 description and applications of, 753b, 753t-755t, 755b, 761, 761f, 1037-1038
 therapy, 753t-755t, 755b, 1037-1038
 types of nursing, 268-269
- Toxic inhalants, 882t**
- Toxic stress, 320b**
- Trace elements, 1053**
- Trachea, 1160, 1161f**
- Tracheal suctioning, 905b-911b, 910f, 912**
- Tracheostomy, 905b-911b, 910f, 912, 913b-919b, 918f**
- Traditional Chinese medicine, 753b, 753t-755t, 762, 762f, 762t**
- Traditional nuclear families, 274-275, 275b**
- Tranquilizers, 1064t**
- Trans fatty acids, 1053**
- Transcellular fluid, 937**
- Transcendence, 436, 443f**
- Transcultural assessment model, 112, 115f**
- Transcultural caring, 264, 264b**
- Transcultural nursing, 112, 264**
- Transcutaneous electrical nerve stimulation (TENS), 1037-1038**
- Transdermal drug systems, 1044**
- Transdermal medication administration, 664t, 670t, 671**
- Transdermal patch (disc), 664t, 670t, 671, 692-697**
- Transsexuality, 416**
- Transfer belts, 1230, 1233b-1240b**
- Transfer of accountability (TOA) guidelines, 223-224**
- Transfer reports, 225**
- Transfer techniques**
 for immobile patients, 1230-1231, 1230b-1231b, 1232f, 1233b-1240b, 1233t
 operating room, 1355
- Transformational leadership practices, 126, 127f**
- Transformative model of caring, 264, 265t, 270**
- Transient flora, 619, 620t**
- Transient incontinence, 1117-1118, 1136b**
- Transient insomnia, 996-997**
- Transmission modes, 619f, 621-622, 621t**
- Transparent film dressings, 1286t, 1287**
- Transpersonal caring, 264**
- Transpersonal communication, 245, 251b**
- Transport**
 infections, 645-646
 to operating room, 1355
 preventing falls during, 811t
 stretchers, 1231, 1233b-1240b
 wheelchairs, 810-812, 810f, 811t
- Transtheoretical model of change, 291b, 296-297**
- Transureteroureterostomy, 1119, 1119f**
- Trapeze bars, 1222, 1222f**
- Trauma; See also accidents; falls**
 affecting chest wall movement and breathing, 883
 as fluid, electrolyte, and acid-base imbalance risk factor, 947-949, 947b
 head, 557-559, 559t
 infections following, 626b
 to musculoskeletal system and immobility, 1198
 post-traumatic stress disorder (PTSD), 477, 483f
 severe stress from, 476
- Travelbee, Joyce, 59b, 61**
- Treatments**
 guidelines for charting, 207t
 interventions (See interventions)
- Trendelenburg's bed position, 867t**
- Triadic questions, 285t**
- Trials, 96b**
- Triglycerides, 1052-1053, 1388t-1389t**
- Trigone, 1115**
- Trimesters, 327-328, 329b, 366, 367t**
- Trochanter rolls, 1221, 1221f**
- True experiments, 73t, 74-75**
- Trust**
versus mistrust stage, 318t, 398b
- Tubal ligation, 421, 422t**
- Tube feeding**
 accuracy of placement, 1101b
 procedures and rates of, 1082-1100, 1088b-1100b
- Tuberculosis, 619-620, 620t-621t, 891, 894b**
- Tumours**
 breast, 589-593, 591t, 1268, 1268f
 lung, 577
 ovarian, 598, 598t, 600b
 skin, 553, 554b
 and skin integrity, 1268, 1268f
 testicular, 602
- Tuning fork tests, 565, 566t-567t**
- Turgor, 550b, 553, 553f**
- Turning, 1343b-1348b, 1346f**
- "Two Spirit", 362**
- Tympanic membrane**
 anatomy and physiology of, 563-565, 564f, 1302t
 inspection of, 833, 1308
 as temperature measuring site, 495-500, 495b-500b
- U**
- Ulcers**
 pressure (See pressure ulcers)
 skin, 553, 554b
- Ulnar artery and pulse, 507t, 585-586, 586f-587f**
- Ultrasound imaging, 1172b**
- Umbilicus, 595**
- Underemployed, 16**
- Unemployment**
 social safety net for, 16
 vulnerable populations, 45, 47-49, 48b
- Unintentional torts, 98-99**
- Unions, 20-21, 102**
- Unit-dose system, 678, 682**
- United Kingdom**
 practical nursing education in, 1372
- United States**
 as highest ranked health care spender, 19
 practical nursing in, 1372
- Universality**
 as principle of *Canadian Health Act of 1984*, 17-18, 18t
- University nursing education, 37-40; See also education**
- University of British Columbia (UBC)**
 behavioural systems model, 59b, 61
- Unregulated care providers (UCPs)**
 duties and education of, 129-130, 1372-1373
 respiratory measurements by, 507b-511b, 515b-520b
 temperature measuring by, 495b-499b, 501b
- Unsafe sex**
 by adolescents, 400, 400b
 community health issue of, 47, 49, 50b
 and sexually transmitted infections/diseases (STIs/STDs), 357-358, 358t, 365, 419-421
 and teenage pregnancy, 275-276, 358, 365
- Unsaturated fats, 1052-1053**
- Upper gastrointestinal barium swallow esophagram, 1172b**
- Upper urinary tract**
 anatomy and physiology of, 1113-1119, 1113f
- Uremic syndrome, 1115, 1116b**
- Ureterostomy, 1119, 1119f**
- Ureters, 1113f-1114f, 1114**
- Urethra**
 anatomy and physiology, 1113f-1114f, 1115
 1143f-1145f
- Urethral catheters, 1137-1138, 1137b, 1143f-1145f**
- Urethral closure mechanism, 1115**
- Urethral meatus, 1115**
- Urethral stricture, 1118**
- Urge incontinence, 1118, 1136b, 1137t**
- Urgency**
 priority setting based on, 174-175
 of surgical procedures, 1328t
- Urinary, 1121t**
- Urinary diary, 1121, 1122f**
- Urinary diversions, 1116, 1119, 1119f**
- Urinary elimination, 1112-1158**
 act of urination, 1115
 anatomy and physiology associated with
 bladder, 1113f-1114f, 1114-1115
 kidneys, 1113-1114, 1113f-1114f
 renal nephron, 1113, 1113f
 ureters, 1113f-1114f, 1114
 urethra, 1113f-1114f, 1115
 catheterization, 1136-1152, 1139b-1146b, 1148b-1152b
 catheter types, 1136-1137, 1137b-1138b, 1138f
 indications for, 1137b
 in-dwelling or straight catheter
 insertion procedures, 1137-1138, 1137b, 1143f-1145f, 1147b-1148b
 changes with immobility, 1201, 1210t, 1211, 1220
 common problems in
 nocturia, 996, 1118
 overactive bladder syndrome, 1118
 urinary diversions, 1119, 1119f
 urinary incontinence, 1117-1118, 1131b-1134b, 1136b
 urinary retention, 1118-1119
 urinary tract infections (UTIs), 1117
 cultural and psychosocial considerations, 1120
 diagnostic examinations, 1129t-1130t, 1396t-1398t
 goals following surgery, 1367
 growth and development factors, 1119-1120
 health promotion, 1134-1135, 1134b
 infection prevention, 1135
 nursing process application to
 alterations in
 assessment, 1120-1130, 1120f, 1121b, 1122f, 1124f, 1124t, 1125b-1127b, 1128f, 1128t-1130t
 evaluation, 1156
 implementation and treatment
 options, 1133-1156, 1134b, 1136b-1148b, 1137t, 1138f, 1153b, 1155b
 nursing diagnosis, 1128t-1130t, 1130, 1130b
 planning, 1130-1133, 1131b-1133b, 1131f, 1133f
 older adult, 1120, 1154b
 postoperative assessment of, 1364t-1365t, 1367-1368
 renin-angiotensin mechanism, 1113-1114, 1114f
- Urinary elimination (Continued)**
 sexuality and self-concept influencing, 1120
 urination habits, 1119, 1121, 1134-1135
- Urinary frequency, 1118**
- Urinary incontinence, 1117-1118**
 habit retraining and prompted voiding, 1155, 1156b
 Kegel exercises, 1154-1156, 1155b
 nursing process case example to
 diagnose, 1120-1156, 1131b-1133b
 in older adults, 379-380, 381t, 382, 392, 1154b
 skin breakdown with, 1118b, 1152-1153
 treatment options, 1136b
 types of, 1117-1118, 1136b
- Urinary retention, 1118-1119, 1121t, 1362, 1364t-1365t, 1366-1367**
- Urinary stasis, 1201**
- Urinary system**
 anatomy and physiology, 1113-1119, 1113f-1114f
 changes with aging, 381-382, 381t
 health promotion, 1134-1135, 1134b-1135b
 organs of, 1113-1119, 1113f
 surgery in older adults, 1331t-1332t
 urine chemistry tests, 1396t-1398t
- Urinary tract infections (UTIs), 1117**
 health care-associated, 624-626, 625b-626b, 1119-1120
 infection defence mechanisms, 623t, 1117, 1119
 postoperative, 1362, 1364t-1365t, 1366-1367
- Urine**
 act of urination (See urination)
 bladder storage of, 1113f-1114f, 1114-1115
 chemistry tests, 1396t-1398t
 colour, clarity, and odour characteristics of, 1123-1124
 disorders associated with, 1117-1119
 intake and output assessment, 1122f-1123f, 1123
 normal voiding amounts daily, 1119-1120
 production of, 1116
 residual, 1117
 specimen collection
 in children, 1124
 in-dwelling catheter collection, 1124f
 midstream (clean-voided) specimen collection, 1125b-1127b, 1125f-1126f
 tests
 laboratory values, ranges and interpretation, 1128t, 1396t-1398t
 specific gravity tests, 1127, 1128t
 urinalysis, 1124-1127, 1128f, 1128t, 1396t-1398t
 urine culture, 1127, 1128t
 Urine specimens, 645, 646b, 1124, 1124f-1126f, 1125b-1127b
 Urodynamic testing, 1129t-1130t
 Urosepsis, 1117
 Urticaria, 667t
 Uterine cancer, 545t-546t
 Utilitarianism, 84
- V**
- Vaccinations, 104, 296b, 337-338, 338t**
- Vagina**
 infection defence mechanisms in, 623t
 medication administration, 664t, 705, 705b-706b, 706f
- Valerian, 764t-765t**
- Validation**
 of data, 161
 of emotions, 255, 286
- Valsalva manoeuvre, 1163, 1172**
- Valuables, 1351-1352**

- Values**
 associated with CNA's code of ethics, 80-82, 82b
 clarification of, 81-82, 81b
 conflict, 81, 91b
 cultural, 81
 defining nursing unit, 128b
 definition of, 80-82
 in families, 284
 formation of, 81
Valvular heart disease, 884-886
Variances
 documenting critical pathway, 213, 213b, 214f-217f
Varicosities (mouth), 570, 570f
Vascular access devices (VAD), 959-971, 959f
Vascular insufficiency
 as skin impairment risk factor, 831b
Vascular system
 aging, 380, 381t
 blood pressure, 583, 585f
 carotid artery function and illustration, 583-584, 583f-585f
 jugular veins, 584, 585f
 lymphatic system, 589, 589f
 peripheral arteries and veins, 584-589, 585t, 586f-588f, 588t
 physical assessment/examination of, 582-589, 583t
 preoperative assessment of, 1336
Vasectomy, 421, 422t
Vasocongestion, 418-419
Vasoconstriction, 492
Vasodilators, 522t
Vastus lateralis muscle injections, 722b-727b, 732-733, 732b, 733f
Vectorborne transmission, 621-622, 621t
Vegan diets, 1066
Vegetables, 1056-1058, 1057f, 1058t, 1065-1067
Vegetarianism, 1065-1067
Vehicle transmission, 621-622, 621t
Venipuncture sites, 970b, 972-973, 972f, 985; *See also* intravenous (IV) therapy
Venn diagram
 Labonte's health and wellness, 2-4, 3f, 44
Venous blood pressure, 583-584, 585f
Venous ulcers, 1266, 1266f-1267f
Ventilation, 513-521, 515b-517b, 880-882, 887
Ventilation/perfusion lung scan, 896b
Ventilatory depth and rhythm, 517, 517t
Ventricles, 879-880, 879f
Ventricular fibrillation, 884, 885t-886t
Ventricular gallop, 582
Ventricular tachycardia, 884, 885t-886t
Ventrogliuteal muscle injections, 722b-727b, 732-734, 732b, 732f
Venturi masks, 927-928, 927t, 928f
Verbal communication
 with families, 283, 283b
 impaired, 253
 tips for effective, 246-247
Verbal descriptor scale (VDS), 1028-1030, 1030f
Verbal orders (VOs), 225, 225b, 675-676, 675b
Vernix caseosa, 328
Vertigo, 1303-1305, 1304b
Vesicles, 553, 554b
Vesicular sounds, 577t
Victorian Order of Nurses (VON), 16b, 17, 35-36, 37f, 43, 238
Violence
 reporting responsibilities, 97
 against women
 domestic violence, 426, 547b-548b, 548
 prevalence in Aboriginal society, 121, 121b
 in young adulthood, 365
 Virchow's triad, 1199, 1200f
Virulence, 619
Viruses, 618-619, 620t, 1167-1168
Visceral pain, 1022, 1022t, 1029t
Viscosity, 521
Visible cultures, 110
Visible minority groups, 109-110, 109f
Vision
 and accidents in older adults, 793-794, 806, 807b, 1309-1310
 assessment of, 378, 560b, 560t, 1307-1311, 1309t
 behavioural signs of deficits in, 1308, 1309t
 causes of deficits, 1303-1305, 1304b
Vision (Continued)
 changes with aging, 380-382, 381t, 1305-1306, 1305b, 1309t
 characteristics of normal, 1302-1305, 1302t
 common problems, 560b
 hazards faced with impaired, 1309-1310
 health promotion, 545t-546t, 1307-1309, 1322
 older adult, 378, 1305-1306, 1305b
 screening recommendations, 345, 545t-546t, 1307-1309, 1308f, 1309t, 1313-1316, 1315b
 visual acuity (*See* visual acuity)
Vision loss
 adjusting to, 1317-1319
 with aging, 380-382, 381t, 1305-1306, 1305b, 1309t
 behavioural signs of, 1308, 1309t
 causes of, 1303-1305, 1304b
 food location (on plate) tip, 1322f
 patient admitting to, 1308, 1310, 1310b, 1317
 preventable blindness, 1313-1316
 prevention of, 1316
 statistics in Canada, 1303
 trauma causing, 1316
Vision screening
 of children, 345, 1315b
 to prevent blindness, 1313-1316
 types of tests, 1307, 1308f, 1309t
Visual acuity, 563
 assessing in older adults, 378
 behavioural signs of deficits in, 1308, 1309t
 changes during middle adulthood, 368, 369t
 changes with aging, 380, 381t
 loss with aging, 380-382, 381t, 1305-1306, 1305b, 1309t
Visual analogue scale (VAS), 1028-1030, 1030f
Visual impairments
 and communication, 258, 259b
 effects of, 1302
 preventable blindness, 1313-1316
 safety measures in hospital environment, 1321
 teaching methods, 305
Visualization, 484-485
Vital signs, 489-536
 acceptable adult readings, 490, 490b
 blood pressure (BP), 521-533 (*See also* blood pressure (BP))
 body temperature, 491-506 (*See also* body temperature)
 definition of, 489-490
 measurement guidelines, 490, 490b-491b, 495-500, 495b-499b
 of older adults, 534b
 preoperative, 1352
 pulse, 506-513 (*See also* pulse)
 respiration rate, 513-521 (*See also* respiration)
Vitamins
 definition of, 1053
 laboratory values and possible etiologies, 1388t-1389t
 megavitamin therapy, 753t-755t
 needs during human growth and development, 1059-1067
 role in wound healing, 1256-1257, 1256t
 therapy in CAM, 753b, 753t-755t
 and vegetarian diets, 1065-1067
Vocabulary
 effective verbal, 246
 expansion in adolescence, 355
 rapid increases in preschoolers, 344
Vocal cords, 1160, 1161f
Vocal fremitus, 575-576, 576f
Voiding
 disorders associated with, 1117-1119
 pontine micturition centre, 1115
 privacy, 1117, 1120, 1136
 prompted, 1155, 1156b
 stimulating micturition reflex, 1134
Volume-controlled IV infusions, 736-741, 742b-747b, 744f-745f
Voluntary agencies, 25
Vomiting
 bulimia nervosa, 357, 1061, 1063t
 postoperative, 1362, 1364t-1365t
Vulnerability processes, 323
Vulnerable groups
 and access to care, 22b
Vulnerable populations
 Aboriginal groups, 45, 47-49, 48b, 120-121
 and access to care, 22b
Vulnerable populations (Continued)
 addictions in, 45, 47-49, 48b
 community health nursing addressing, 45, 47-49, 48b, 48f
 disabled persons, 45, 47-49, 48b
 ethical obligations of nurses regarding, 83b
 homeless, 45, 47-49, 48b, 48f
 mentally ill, 47-49, 48b
 nursing awareness of social inequities, 91b
 poverty, 45, 47-49, 48b
 Vygotsky's zones of proximal development, 322
W
Waist circumference (WC), 1068
Walker assistive devices, 1243-1246, 1243f, 1310b
Walking
 helping a patient, 1241-1243, 1242f
 mixed with isometric exercises, 774-775
Water
Eating Well with Canada's Food Guide recommendations, 1056
 importance in human body function, 1053
 needed by microorganisms, 620
 Water excess, 944t
 Water pollution, 792
 Water-soluble vitamins, 1053
 Watson, Jean, 62
 Watson's carative processes, 264, 265t, 270
 "Ways of knowing", 58
Web sites; *See also* last page of individual chapters
 for anatomy information, 538-539
 best practice guidelines, 144
 gerontological nursing, 378-387
 scientific literature, 68b
 Weber test, 566t-567t
Weight
 and gravity, 1196
 physical assessment/examination of, 548-550, 549f-550f, 549t
Weir Report, 37
Welch Allyn AudioScope, 1308
Wellness
 activities during middle adulthood, 370-372, 371b
 definitions and qualities of, 2-3, 2f
 ethical responsibility of nurses to promote, 82b
 and lifestyle choices for older adults, 387b, 388-391
 nursing diagnosis, 166
 West Nile Virus, 24
 West nomograms, 674-675, 674f
 Wheals, 553, 554b
Wheelchairs
 measures to prevent falls, 810-812, 810f, 811t
 Wheezes, 577, 578t
 Wheezing, 891
 Whispered pectoriloquy, 577
 Whistle blowing, 90-91
White blood cells (WBCs)
 and infection control, 624, 627, 627b, 629b, 629t, 1128t
 measurement and normal values, 1337t, 1393t
 and wound repair, 1265
White coat hypertension, 522-523, 523b
Whole medical systems
 in complementary and alternative medicine, 753b, 753t-755t
Women; *See also* female reproductive tract and genitals
 assessment variables for, 157b-158b
 feminist ethics, 85-86
 menopause and perimenopause, 368, 369t, 372b, 493, 591b
 pelvic floor trauma, 1168
 self-concept in adolescent, 397
 sexual response cycle, 418-419
 violence
 domestic violence, 426, 547b-548b, 548
 prevalence in Aboriginal society, 121, 121b
 vulnerability to homelessness and poverty, 47-48
Women's rights
 and registration of nurses, 37-38
 social equality struggles, 38-40, 71
Wong-Baker FACES scale, 1028, 1030f
Worden's Four Tasks of Mourning, 449t, 450
Workforce
 CNA statistics and facts, 15-16, 16b, 1372
 issues for practical nursing in Canada, 1377, 1377t
Workplace environments
 as determinant of health, 5, 7-8
 ethical issues, 5, 7-8
 hazardous, 48
 health risks due to, 365
 healthy, 126, 128b
 issues for practical nursing in Canada, 1377
 noise pollution, 792, 793f
 safety risks in health care, 794-796, 795f
 stress management in, 485-486
Workplace Hazardous Materials Information System (WHMIS), 794, 795f
World Health Organization (WHO)
 defining health, 2-3
 "Health for All 2000", 4, 5f
Jakarta Declaration and Bangkok Charter, 5-6
 on *Nutrition for Health: An Agenda for Action*, 1059
 pain relief ladder, 1043-1045, 1044f
 on palliative care, 463
 on preventable blindness and screening, 1313-1316
 Surgical Safety Checklist, 1326, 1352-1354
Wound contraction, 1265-1266
Wound dressings, 1280-1290, 1281b-1285b, 1284f, 1286t, 1290f
Wound healing
 and collagen, 1251-1253, 1251b, 1256
 critical thinking, 1257-1258, 1258f
 dressings, 1274b
 nutritional, protein and hemoglobin assessment, 1280, 1280b
 in obese surgical patients, 1330-1332
 process of, 1264, 1265f
 role of nutrients and vitamins in, 1256-1257, 1257b
Wounds
 abrasions *versus* lacerations, 1268
 acute and emergency setting, 1268-1270
 appearance of, 1268-1269, 1269t
 arterial ulcers, 1266-1267
 bandages and binders, 1294, 1295b-1298b
 characteristics indicating infection, 1257, 1257b
 classification of, 1264, 1264t
 cleaning and irrigation, 1277-1280, 1278b-1279b, 1290-1291, 1290f, 1291b-1293b
 closure, 1270
 contamination and skin integrity, 1271-1272, 1272b
 cultures, 1270, 1271b
 debridement, 1277-1280
 deep tissue injuries, 1262t-1263t, 1263b
 dehiscence, 1271, 1272f
 diabetic ulcers, 1267-1268, 1267f
 drainage characteristics, 1268-1269, 1269t, 1270f
 drainage evacuators, 1294, 1294f
 dressings, 1274b, 1280-1290, 1281b-1285b, 1284f, 1286t, 1290f
 evisceration, 1271
 exudate characteristics, 1268-1269, 1269t, 1270f
 healing process, 1264, 1265f
 home care recommendations, 1274b
 infections, 626b, 1257, 1257b, 1271, 1274b, 1361-1362, 1364t-1365t
 onset and duration parameters, 1264t
 packing, 1282b-1285b, 1284f, 1289
 partial and full-thickness repair, 1262t-1263t, 1264-1266
 postoperative assessment of, 1361-1362, 1364t-1365t
 remodeling, 1266
 specimens, 645, 646b
 surgical, 1257b, 1264, 1264t, 1268-1270, 1290-1294, 1350-1351
 sutures and staples, 1291-1294, 1291f, 1293f
 swabbing technique, 1270, 1271b, 1271f
 tissue repair, 623t, 624
 topical medications, 1288-1289
 venous ulcers, 1266, 1266f-1267f
Wrist
 joint movement, 1204t-1208t, 1241, 1241f
 range of motion, 607f

X

Xerostomia, 837t, 1304b
X-ray with contrast medium, 1170t, 1172b

Y

Yearning and searching phase
 in Bowlby's mourning theory, 449–450, 449t
Yin and yang, 118b, 762

Yoga, 444b, 753b, 753t–755t

Young adulthood/young adults
 age period defining, 361–362
 breasts changes, 591b
 career, 362–363
 cognitive changes, 362
 emotional health, 364, 364b
 exercise recommendations, 784b
 health risks/concerns, 364–368

Young adulthood/young adults (*Continued*)

 hearing loss, 792, 793f, 1305–1306, 1315–1316
 peer navigators, 364, 364b, 364f
 physical changes, 362, 775
 pregnancy, 365–367, 367b, 368t
 psychosocial changes, 362–364
 respiratory tract infections, 888
 sexuality and parenthood, 363–364, 363b

Young adulthood/young adults (*Continued*)

 sleep patterns, 1000
 teaching methods for, 295, 295b

Z

Zinc, 1067, 1256–1257, 1256t, 1388t–1389t
Zones of proximal development, 322
Z-track method, 722b–727b, 733–734, 734f
Zygote, 327

